

Scikit Data Access

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Contents

1	Namespace Index	1
1.1	Packages	1
2	Hierarchical Index	3
2.1	Class Hierarchy	3
3	Class Index	5
3.1	Class List	5
4	File Index	7
4.1	File List	7
5	Namespace Documentation	9
5.1	skdaccess Namespace Reference	9
5.2	skdaccess.astro Namespace Reference	9
5.3	skdaccess.astro.kepler Namespace Reference	9
5.4	skdaccess.astro.kepler.data_fetcher Namespace Reference	9
5.5	skdaccess.bin Namespace Reference	10
5.6	skdaccess.bin.skdaccess Namespace Reference	10
5.6.1	Function Documentation	10
5.6.1.1	skdaccess_script()	10
5.7	skdaccess.framework Namespace Reference	10
5.8	skdaccess.framework.data_class Namespace Reference	11

5.9	skdaccess.framework.param_class Namespace Reference	11
5.10	skdaccess.geo Namespace Reference	12
5.11	skdaccess.geo.gldas Namespace Reference	12
5.12	skdaccess.geo.gldas.data_fetcher Namespace Reference	12
5.13	skdaccess.geo.grace Namespace Reference	12
5.14	skdaccess.geo.grace.data_fetcher Namespace Reference	12
5.15	skdaccess.geo.groundwater Namespace Reference	12
5.16	skdaccess.geo.groundwater.data_fetcher Namespace Reference	13
5.17	skdaccess.geo.modis Namespace Reference	13
5.18	skdaccess.geo.modis.cache Namespace Reference	13
5.19	skdaccess.geo.modis.cache.cloud_mask Namespace Reference	13
5.20	skdaccess.geo.modis.cache.cloud_mask.data_fetcher Namespace Reference	13
5.21	skdaccess.geo.modis.cache.cloud_opacity Namespace Reference	13
5.22	skdaccess.geo.modis.cache.cloud_opacity.data_fetcher Namespace Reference	14
5.23	skdaccess.geo.modis.cache.data_fetcher Namespace Reference	14
5.24	skdaccess.geo.modis.cache.reflectance Namespace Reference	14
5.25	skdaccess.geo.modis.cache.reflectance.data_fetcher Namespace Reference	14
5.26	skdaccess.geo.modis.stream Namespace Reference	14
5.27	skdaccess.geo.modis.stream.cloud_mask Namespace Reference	14
5.28	skdaccess.geo.modis.stream.cloud_mask.data_fetcher Namespace Reference	15
5.29	skdaccess.geo.modis.stream.cloud_opacity Namespace Reference	15
5.30	skdaccess.geo.modis.stream.cloud_opacity.data_fetcher Namespace Reference	15
5.31	skdaccess.geo.modis.stream.data_fetcher Namespace Reference	15
5.32	skdaccess.geo.modis.stream.reflectance Namespace Reference	15
5.33	skdaccess.geo.modis.stream.reflectance.data_fetcher Namespace Reference	15
5.34	skdaccess.geo.pbo Namespace Reference	16
5.35	skdaccess.geo.pbo.data_fetcher Namespace Reference	16
5.36	skdaccess.utilities Namespace Reference	16

5.37	skdaccess.utilities.grace_util Namespace Reference	16
5.37.1	Function Documentation	16
5.37.1.1	averageDates()	16
5.37.1.2	computeEWD()	17
5.37.1.3	dateMismatch()	17
5.37.1.4	readGraceData()	18
5.38	skdaccess.utilities.gw_util Namespace Reference	18
5.38.1	Function Documentation	18
5.38.1.1	combine_water_heights()	18
5.39	skdaccess.utilities.kepler_util Namespace Reference	19
5.39.1	Function Documentation	19
5.39.1.1	normalize()	19
5.40	skdaccess.utilities.modis_util Namespace Reference	19
5.40.1	Function Documentation	20
5.40.1.1	calibrateModis()	20
5.40.1.2	checkBit()	20
5.40.1.3	createGrid()	21
5.40.1.4	getFileIDs()	22
5.40.1.5	getFileURLs()	22
5.40.1.6	getImageType()	23
5.40.1.7	getModisData()	23
5.40.1.8	readMODISData()	24
5.40.1.9	rescale()	24
5.41	skdaccess.utilities.pbo_util Namespace Reference	24
5.41.1	Function Documentation	25
5.41.1.1	getLatLonRange()	25
5.41.1.2	getROIstations()	25
5.41.1.3	getStationCoords()	26
5.41.1.4	nostab_sys()	26
5.41.1.5	propagateErrors()	27
5.41.1.6	removeAntennaOffset()	27
5.41.1.7	stab_sys()	28

6 Class Documentation	31
6.1 skdaccess.framework.param_class.AutoList Class Reference	31
6.1.1 Detailed Description	32
6.1.2 Constructor & Destructor Documentation	32
6.1.2.1 __init__()	32
6.1.3 Member Function Documentation	32
6.1.3.1 __call__()	32
6.1.3.2 __getitem__()	33
6.1.3.3 __len__()	33
6.1.3.4 __setitem__()	33
6.1.3.5 __str__()	34
6.1.3.6 getAllOptions()	34
6.1.3.7 perturb()	34
6.1.3.8 reset()	34
6.1.3.9 val()	35
6.1.4 Member Data Documentation	35
6.1.4.1 val_init	35
6.1.4.2 val_list	35
6.2 skdaccess.framework.param_class.AutoListCycle Class Reference	35
6.2.1 Detailed Description	36
6.2.2 Constructor & Destructor Documentation	36
6.2.2.1 __init__()	36
6.2.3 Member Function Documentation	37
6.2.3.1 __call__()	37
6.2.3.2 __getitem__()	37
6.2.3.3 __len__()	37
6.2.3.4 __setitem__()	38
6.2.3.5 __str__()	38

6.2.3.6	getAllOptions()	38
6.2.3.7	perturb()	39
6.2.3.8	reset()	39
6.2.3.9	val()	39
6.2.4	Member Data Documentation	39
6.2.4.1	index	39
6.2.4.2	list_val_list	39
6.2.4.3	val_init	40
6.2.4.4	val_list	40
6.3	skdaccess.framework.param_class.AutoListPermute Class Reference	40
6.3.1	Detailed Description	41
6.3.2	Member Function Documentation	41
6.3.2.1	__call__()	41
6.3.2.2	__getitem__()	41
6.3.2.3	__len__()	42
6.3.2.4	__setitem__()	42
6.3.2.5	__str__()	42
6.3.2.6	getAllOptions()	43
6.3.2.7	perturb()	43
6.3.2.8	reset()	43
6.3.2.9	val()	43
6.3.3	Member Data Documentation	43
6.3.3.1	val_init	44
6.3.3.2	val_list	44
6.4	skdaccess.framework.param_class.AutoListRemove Class Reference	44
6.4.1	Detailed Description	45
6.4.2	Constructor & Destructor Documentation	45
6.4.2.1	__init__()	45

6.4.3	Member Function Documentation	45
6.4.3.1	__call__()	45
6.4.3.2	__getitem__()	46
6.4.3.3	__len__()	46
6.4.3.4	__setitem__()	46
6.4.3.5	__str__()	47
6.4.3.6	getAllOptions()	47
6.4.3.7	perturb()	47
6.4.3.8	reset()	47
6.4.3.9	val()	48
6.4.4	Member Data Documentation	48
6.4.4.1	n	48
6.4.4.2	val_init	48
6.4.4.3	val_list	48
6.5	skdaccess.framework.param_class.AutoListSubset Class Reference	48
6.5.1	Detailed Description	49
6.5.2	Member Function Documentation	49
6.5.2.1	__call__()	49
6.5.2.2	__getitem__()	50
6.5.2.3	__len__()	50
6.5.2.4	__setitem__()	50
6.5.2.5	__str__()	51
6.5.2.6	getAllOptions()	51
6.5.2.7	perturb()	51
6.5.2.8	reset()	51
6.5.2.9	val()	52
6.5.3	Member Data Documentation	52
6.5.3.1	val_init	52

6.5.3.2	val_list	52
6.6	skdaccess.framework.param_class.AutoParam Class Reference	52
6.6.1	Detailed Description	53
6.6.2	Constructor & Destructor Documentation	53
6.6.2.1	__init__()	53
6.6.3	Member Function Documentation	54
6.6.3.1	__call__()	54
6.6.3.2	__str__()	54
6.6.3.3	perturb()	54
6.6.3.4	reset()	54
6.6.4	Member Data Documentation	55
6.6.4.1	val	55
6.6.4.2	val_init	55
6.7	skdaccess.framework.param_class.AutoParamList Class Reference	55
6.7.1	Detailed Description	56
6.7.2	Constructor & Destructor Documentation	56
6.7.2.1	__init__()	56
6.7.3	Member Function Documentation	56
6.7.3.1	__call__()	56
6.7.3.2	__str__()	57
6.7.3.3	perturb()	57
6.7.3.4	reset()	57
6.7.4	Member Data Documentation	57
6.7.4.1	val	57
6.7.4.2	val_init	57
6.7.4.3	val_list	58
6.8	skdaccess.framework.param_class.AutoParamListCycle Class Reference	58
6.8.1	Detailed Description	58

6.8.2	Constructor & Destructor Documentation	59
6.8.2.1	__init__()	59
6.8.3	Member Function Documentation	59
6.8.3.1	__call__()	59
6.8.3.2	__str__()	59
6.8.3.3	perturb()	60
6.8.3.4	reset()	60
6.8.4	Member Data Documentation	60
6.8.4.1	current_index	60
6.8.4.2	val	60
6.8.4.3	val_init	60
6.8.4.4	val_list	60
6.9	skdaccess.framework.param_class.AutoParamMinMax Class Reference	61
6.9.1	Detailed Description	61
6.9.2	Constructor & Destructor Documentation	61
6.9.2.1	__init__()	62
6.9.3	Member Function Documentation	62
6.9.3.1	__call__()	62
6.9.3.2	__str__()	62
6.9.3.3	perturb()	63
6.9.3.4	reset()	63
6.9.4	Member Data Documentation	63
6.9.4.1	decimals	63
6.9.4.2	n	63
6.9.4.3	n_max	63
6.9.4.4	val	63
6.9.4.5	val_init	64
6.9.4.6	val_max	64

6.9.4.7	val_min	64
6.10	skdaccess.geo.modis.cache.reflectance.DataFetcher Class Reference	64
6.10.1	Detailed Description	64
6.10.2	Constructor & Destructor Documentation	65
6.10.2.1	__init__()	65
6.11	skdaccess.geo.modis.stream.reflectance.DataFetcher Class Reference	65
6.11.1	Detailed Description	66
6.11.2	Constructor & Destructor Documentation	66
6.11.2.1	__init__()	66
6.12	skdaccess.geo.pbo.DataFetcher Class Reference	67
6.12.1	Detailed Description	68
6.12.2	Constructor & Destructor Documentation	68
6.12.2.1	__init__()	68
6.12.3	Member Function Documentation	69
6.12.3.1	__str__()	69
6.12.3.2	downloadFullDataset()	69
6.12.3.3	getAntennaLogs()	70
6.12.3.4	getConfig()	70
6.12.3.5	getDataLocation()	70
6.12.3.6	getInfo()	71
6.12.3.7	getMetadata()	71
6.12.3.8	getStationMetadata()	71
6.12.3.9	multirun_enabled()	71
6.12.3.10	output()	72
6.12.3.11	perturb()	72
6.12.3.12	reset()	72
6.12.3.13	setDataLocation()	72
6.12.3.14	setStationList()	73

6.12.3.15 writeConfig()	73
6.12.4 Member Data Documentation	73
6.12.4.1 antenna_info	73
6.12.4.2 ap_paramList	73
6.12.4.3 default_columns	74
6.12.4.4 default_error_columns	74
6.12.4.5 meta_data	74
6.12.4.6 station_list	74
6.12.4.7 use_progress_bar	74
6.13 skdaccess.geo.gldas.DataFetcher Class Reference	74
6.13.1 Detailed Description	75
6.13.2 Constructor & Destructor Documentation	75
6.13.2.1 __init__()	76
6.13.3 Member Function Documentation	76
6.13.3.1 __str__()	76
6.13.3.2 downloadFullDataset()	76
6.13.3.3 getConfig()	77
6.13.3.4 getDataLocation()	77
6.13.3.5 getMetadata()	77
6.13.3.6 multirun_enabled()	78
6.13.3.7 output()	78
6.13.3.8 perturb()	78
6.13.3.9 reset()	78
6.13.3.10 setDataLocation()	78
6.13.3.11 writeConfig()	79
6.13.4 Member Data Documentation	79
6.13.4.1 ap_paramList	79
6.13.4.2 end_date	79

6.13.4.3	resample	79
6.13.4.4	start_date	80
6.14	skdaccess.geo.grace.DataFetcher Class Reference	80
6.14.1	Detailed Description	81
6.14.2	Constructor & Destructor Documentation	81
6.14.2.1	__init__()	81
6.14.3	Member Function Documentation	81
6.14.3.1	__str__()	82
6.14.3.2	downloadFullDataset()	82
6.14.3.3	getConfig()	82
6.14.3.4	getDataLocation()	82
6.14.3.5	getMetadata()	83
6.14.3.6	multirun_enabled()	83
6.14.3.7	output()	83
6.14.3.8	perturb()	84
6.14.3.9	reset()	84
6.14.3.10	setDataLocation()	84
6.14.3.11	writeConfig()	84
6.14.4	Member Data Documentation	85
6.14.4.1	ap_paramList	85
6.14.4.2	end_date	85
6.14.4.3	start_date	85
6.15	skdaccess.geo.groundwater.DataFetcher Class Reference	85
6.15.1	Detailed Description	86
6.15.2	Constructor & Destructor Documentation	86
6.15.2.1	__init__()	87
6.15.3	Member Function Documentation	87
6.15.3.1	__str__()	87

6.15.3.2	<code>downloadFullDataset()</code>	87
6.15.3.3	<code>getConfig()</code>	88
6.15.3.4	<code>getDataLocation()</code>	88
6.15.3.5	<code>getMetadata()</code>	88
6.15.3.6	<code>getStationMetadata()</code>	89
6.15.3.7	<code>multirun_enabled()</code>	89
6.15.3.8	<code>output()</code>	89
6.15.3.9	<code>perturb()</code>	90
6.15.3.10	<code>reset()</code>	90
6.15.3.11	<code>setDataLocation()</code>	90
6.15.3.12	<code>writeConfig()</code>	90
6.15.4	Member Data Documentation	91
6.15.4.1	<code>ap_paramList</code>	91
6.15.4.2	<code>cutoff</code>	91
6.15.4.3	<code>end_date</code>	91
6.15.4.4	<code>start_date</code>	91
6.16	<code>skdaccess.astro.kepler.DataFetcher</code> Class Reference	91
6.16.1	Detailed Description	92
6.16.2	Constructor & Destructor Documentation	92
6.16.2.1	<code>__init__()</code>	93
6.16.3	Member Function Documentation	93
6.16.3.1	<code>__str__()</code>	93
6.16.3.2	<code>cacheData()</code> [1/2]	93
6.16.3.3	<code>cacheData()</code> [2/2]	93
6.16.3.4	<code>downloadKeplerData()</code>	94
6.16.3.5	<code>getConfig()</code>	94
6.16.3.6	<code>getDataLocation()</code>	95
6.16.3.7	<code>getMetadata()</code>	95

6.16.3.8	multirun_enabled()	95
6.16.3.9	output()	96
6.16.3.10	perturb()	96
6.16.3.11	reset()	96
6.16.3.12	setDataLocation()	96
6.16.3.13	writeConfig()	97
6.16.4	Member Data Documentation	97
6.16.4.1	ap_paramList	97
6.16.4.2	quarter_list	97
6.17	skdaccess.geo.modis.cache.cloud_mask.DataFetcher Class Reference	97
6.17.1	Detailed Description	98
6.17.2	Constructor & Destructor Documentation	98
6.17.2.1	__init__()	98
6.18	skdaccess.geo.modis.cache.cloud_opacity.DataFetcher Class Reference	98
6.18.1	Detailed Description	99
6.18.2	Constructor & Destructor Documentation	99
6.18.2.1	__init__()	99
6.19	skdaccess.geo.modis.cache.DataFetcher Class Reference	100
6.19.1	Detailed Description	101
6.19.2	Constructor & Destructor Documentation	101
6.19.2.1	__init__()	101
6.19.3	Member Function Documentation	102
6.19.3.1	__str__()	102
6.19.3.2	cacheData() [1/2]	102
6.19.3.3	cacheData() [2/2]	103
6.19.3.4	find_data()	103
6.19.3.5	getConfig()	103
6.19.3.6	getDataLocation()	104

6.19.3.7	getMetadata()	104
6.19.3.8	multirun_enabled()	104
6.19.3.9	output()	105
6.19.3.10	perturb()	105
6.19.3.11	reset()	105
6.19.3.12	setDataLocation()	105
6.19.3.13	writeConfig()	106
6.19.4	Member Data Documentation	106
6.19.4.1	ap_paramList	106
6.19.4.2	daynightboth	106
6.19.4.3	end_date	106
6.19.4.4	grid	106
6.19.4.5	grid_fill	107
6.19.4.6	modis_id	107
6.19.4.7	modis_identifier	107
6.19.4.8	modis_platform	107
6.19.4.9	start_date	107
6.19.4.10	use_long_name	107
6.19.4.11	variable_list	107
6.20	skdaccess.geo.modis.stream.cloud_opacity.DataFetcher Class Reference	108
6.20.1	Detailed Description	108
6.20.2	Constructor & Destructor Documentation	108
6.20.2.1	__init__()	108
6.21	skdaccess.geo.modis.stream.cloud_mask.DataFetcher Class Reference	109
6.21.1	Detailed Description	109
6.21.2	Constructor & Destructor Documentation	109
6.21.2.1	__init__()	109
6.22	skdaccess.geo.modis.stream.DataFetcher Class Reference	110

6.22.1 Detailed Description	111
6.22.2 Constructor & Destructor Documentation	111
6.22.2.1 __init__()	111
6.22.3 Member Function Documentation	112
6.22.3.1 __str__()	112
6.22.3.2 getConfig()	112
6.22.3.3 getMetadata()	113
6.22.3.4 multirun_enabled()	113
6.22.3.5 output()	113
6.22.3.6 perturb()	113
6.22.3.7 reset()	114
6.22.3.8 retrieveOnlineData()	114
6.22.3.9 writeConfig()	114
6.22.4 Member Data Documentation	114
6.22.4.1 ap_paramList	115
6.22.4.2 daynightboth	115
6.22.4.3 end_date	115
6.22.4.4 grid	115
6.22.4.5 grid_fill	115
6.22.4.6 modis_id	115
6.22.4.7 modis_identifier	115
6.22.4.8 modis_platform	116
6.22.4.9 start_date	116
6.22.4.10 use_long_name	116
6.22.4.11 variable_list	116
6.23 skdaccess.framework.data_class.DataFetcherBase Class Reference	116
6.23.1 Detailed Description	117
6.23.2 Constructor & Destructor Documentation	117

6.23.2.1	<code>__init__()</code>	117
6.23.3	Member Function Documentation	118
6.23.3.1	<code>__str__()</code>	118
6.23.3.2	<code>getConfig()</code>	118
6.23.3.3	<code>getMetadata()</code>	118
6.23.3.4	<code>multirun_enabled()</code>	118
6.23.3.5	<code>output()</code>	119
6.23.3.6	<code>perturb()</code>	119
6.23.3.7	<code>reset()</code>	119
6.23.3.8	<code>writeConfig()</code>	119
6.23.4	Member Data Documentation	120
6.23.4.1	<code>ap_paramList</code>	120
6.24	<code>skdaccess.framework.data_class.DataFetcherCache</code> Class Reference	120
6.24.1	Detailed Description	121
6.24.2	Member Function Documentation	121
6.24.2.1	<code>__str__()</code>	121
6.24.2.2	<code>cacheData()</code>	121
6.24.2.3	<code>getConfig()</code>	122
6.24.2.4	<code>getDataLocation()</code>	122
6.24.2.5	<code>getMetadata()</code>	122
6.24.2.6	<code>multirun_enabled()</code>	123
6.24.2.7	<code>output()</code>	123
6.24.2.8	<code>perturb()</code>	123
6.24.2.9	<code>reset()</code>	123
6.24.2.10	<code>setDataLocation()</code>	123
6.24.2.11	<code>writeConfig()</code>	124
6.24.3	Member Data Documentation	124
6.24.3.1	<code>ap_paramList</code>	124

6.25	skdaccess.framework.data_class.DataFetcherLocal Class Reference	124
6.25.1	Detailed Description	125
6.25.2	Member Function Documentation	125
6.25.2.1	__str__()	125
6.25.2.2	getConfig()	126
6.25.2.3	getDataLocation()	126
6.25.2.4	getMetadata()	126
6.25.2.5	multirun_enabled()	127
6.25.2.6	output()	127
6.25.2.7	perturb()	127
6.25.2.8	reset()	127
6.25.2.9	setDataLocation()	127
6.25.2.10	writeConfig()	128
6.25.3	Member Data Documentation	128
6.25.3.1	ap_paramList	128
6.26	skdaccess.framework.data_class.DataFetcherStorage Class Reference	128
6.26.1	Detailed Description	129
6.26.2	Member Function Documentation	129
6.26.2.1	__str__()	129
6.26.2.2	downloadFullDataset()	130
6.26.2.3	getConfig()	130
6.26.2.4	getDataLocation()	130
6.26.2.5	getMetadata()	131
6.26.2.6	multirun_enabled()	131
6.26.2.7	output()	131
6.26.2.8	perturb()	132
6.26.2.9	reset()	132
6.26.2.10	setDataLocation()	132

6.26.2.11	writeConfig()	132
6.26.3	Member Data Documentation	133
6.26.3.1	ap_paramList	133
6.27	skdaccess.framework.data_class.DataFetcherStream Class Reference	133
6.27.1	Detailed Description	134
6.27.2	Member Function Documentation	134
6.27.2.1	__str__()	134
6.27.2.2	getConfig()	134
6.27.2.3	getMetadata()	134
6.27.2.4	multirun_enabled()	135
6.27.2.5	output()	135
6.27.2.6	perturb()	135
6.27.2.7	reset()	135
6.27.2.8	retrieveOnlineData()	135
6.27.2.9	writeConfig()	136
6.27.3	Member Data Documentation	136
6.27.3.1	ap_paramList	136
6.28	skdaccess.framework.data_class.DataWrapperBase Class Reference	136
6.28.1	Detailed Description	137
6.28.2	Constructor & Destructor Documentation	137
6.28.2.1	__init__()	137
6.28.3	Member Function Documentation	138
6.28.3.1	addResult()	138
6.28.3.2	get()	138
6.28.3.3	getIterator()	138
6.28.3.4	getResults()	139
6.28.3.5	info()	139
6.28.3.6	reset()	139

6.28.3.7	update()	139
6.28.4	Member Data Documentation	140
6.28.4.1	constants	140
6.28.4.2	data	140
6.28.4.3	meta_data	140
6.28.4.4	results	140
6.28.4.5	run_id	140
6.29	skdaccess.framework.data_class.ImageWrapper Class Reference	141
6.29.1	Detailed Description	141
6.29.2	Member Function Documentation	142
6.29.2.1	addResult()	142
6.29.2.2	deleteData()	142
6.29.2.3	get()	142
6.29.2.4	getIterator()	143
6.29.2.5	getResults()	143
6.29.2.6	info()	143
6.29.2.7	reset()	143
6.29.2.8	update()	143
6.29.2.9	updateData()	144
6.29.3	Member Data Documentation	144
6.29.3.1	constants	144
6.29.3.2	data	144
6.29.3.3	meta_data	144
6.29.3.4	results	145
6.29.3.5	run_id	145
6.30	skdaccess.utilities.modis_util.LatLon Class Reference	145
6.30.1	Detailed Description	146
6.30.2	Constructor & Destructor Documentation	146

6.30.2.1	__init__()	146
6.30.3	Member Function Documentation	146
6.30.3.1	__call__()	146
6.30.4	Member Data Documentation	147
6.30.4.1	alat	147
6.30.4.2	alon	147
6.30.4.3	lat_data	147
6.30.4.4	lon_data	147
6.30.4.5	x_offset	147
6.30.4.6	y_offset	147
6.31	skdaccess.framework.data_class.SeriesDictionaryWrapper Class Reference	148
6.31.1	Detailed Description	149
6.31.2	Member Function Documentation	149
6.31.2.1	addResult()	149
6.31.2.2	get()	149
6.31.2.3	getIndices()	149
6.31.2.4	getIterator()	150
6.31.2.5	getLength()	150
6.31.2.6	getResults()	150
6.31.2.7	info()	150
6.31.2.8	reset()	151
6.31.2.9	update()	151
6.31.3	Member Data Documentation	151
6.31.3.1	constants	151
6.31.3.2	data	151
6.31.3.3	data_names	151
6.31.3.4	error_names	152
6.31.3.5	meta_data	152

6.31.3.6	results	152
6.31.3.7	run_id	152
6.32	skdaccess.framework.data_class.SeriesWrapper Class Reference	152
6.32.1	Detailed Description	153
6.32.2	Constructor & Destructor Documentation	153
6.32.2.1	__init__()	154
6.32.3	Member Function Documentation	155
6.32.3.1	addResult()	155
6.32.3.2	get()	155
6.32.3.3	getIndices()	156
6.32.3.4	getIterator()	156
6.32.3.5	getLength()	156
6.32.3.6	getResults()	156
6.32.3.7	info()	157
6.32.3.8	reset()	157
6.32.3.9	update()	157
6.32.4	Member Data Documentation	157
6.32.4.1	constants	157
6.32.4.2	data	158
6.32.4.3	data_names	158
6.32.4.4	error_names	158
6.32.4.5	meta_data	158
6.32.4.6	results	158
6.32.4.7	run_id	158
6.33	skdaccess.framework.data_class.TableWrapper Class Reference	159
6.33.1	Detailed Description	160
6.33.2	Constructor & Destructor Documentation	160
6.33.2.1	__init__()	160

6.33.3	Member Function Documentation	160
6.33.3.1	addColumn()	161
6.33.3.2	addResult()	161
6.33.3.3	get()	161
6.33.3.4	getDefaultColumns()	162
6.33.3.5	getDefaultErrorColumns()	162
6.33.3.6	getIterator()	162
6.33.3.7	getLength()	162
6.33.3.8	getResults()	163
6.33.3.9	info()	163
6.33.3.10	removeFrames()	163
6.33.3.11	reset()	163
6.33.3.12	update()	164
6.33.3.13	updateData()	164
6.33.3.14	updateFrames()	164
6.33.4	Member Data Documentation	165
6.33.4.1	constants	165
6.33.4.2	data	165
6.33.4.3	default_columns	165
6.33.4.4	default_error_columns	165
6.33.4.5	meta_data	165
6.33.4.6	results	165
6.33.4.7	run_id	165

7 File Documentation	167
7.1 astro/kepler/data_fetcher.py File Reference	167
7.2 geo/gldas/data_fetcher.py File Reference	167
7.3 geo/grace/data_fetcher.py File Reference	167
7.4 geo/groundwater/data_fetcher.py File Reference	168
7.5 geo/modis/cache/cloud_mask/data_fetcher.py File Reference	168
7.6 geo/modis/cache/cloud_opacity/data_fetcher.py File Reference	168
7.7 geo/modis/cache/data_fetcher.py File Reference	169
7.8 geo/modis/cache/reflectance/data_fetcher.py File Reference	169
7.9 geo/modis/stream/cloud_mask/data_fetcher.py File Reference	169
7.10 geo/modis/stream/cloud_opacity/data_fetcher.py File Reference	169
7.11 geo/modis/stream/data_fetcher.py File Reference	170
7.12 geo/modis/stream/reflectance/data_fetcher.py File Reference	170
7.13 geo/pbo/data_fetcher.py File Reference	170
7.14 bin/skdaccess.py File Reference	171
7.15 framework/data_class.py File Reference	171
7.16 framework/param_class.py File Reference	172
7.17 utilities/grace_util.py File Reference	172
7.18 utilities/gw_util.py File Reference	173
7.19 utilities/kepler_util.py File Reference	173
7.20 utilities/modis_util.py File Reference	173
7.21 utilities/pbo_util.py File Reference	174
 Index	 175

Chapter 1

Namespace Index

1.1 Packages

Here are the packages with brief descriptions (if available):

skdaccess	9
skdaccess.astro	9
skdaccess.astro.kepler	9
skdaccess.astro.kepler.data_fetcher	9
skdaccess.bin	10
skdaccess.bin.skdaccess	10
skdaccess.framework	10
skdaccess.framework.data_class	11
skdaccess.framework.param_class	11
skdaccess.geo	12
skdaccess.geo.gldas	12
skdaccess.geo.gldas.data_fetcher	12
skdaccess.geo.grace	12
skdaccess.geo.grace.data_fetcher	12
skdaccess.geo.groundwater	12
skdaccess.geo.groundwater.data_fetcher	13
skdaccess.geo.modis	13
skdaccess.geo.modis.cache	13
skdaccess.geo.modis.cache.cloud_mask	13
skdaccess.geo.modis.cache.cloud_mask.data_fetcher	13
skdaccess.geo.modis.cache.cloud_opacity	13
skdaccess.geo.modis.cache.cloud_opacity.data_fetcher	14
skdaccess.geo.modis.cache.data_fetcher	14
skdaccess.geo.modis.cache.reflectance	14
skdaccess.geo.modis.cache.reflectance.data_fetcher	14
skdaccess.geo.modis.stream	14
skdaccess.geo.modis.stream.cloud_mask	14
skdaccess.geo.modis.stream.cloud_mask.data_fetcher	15
skdaccess.geo.modis.stream.cloud_opacity	15
skdaccess.geo.modis.stream.cloud_opacity.data_fetcher	15
skdaccess.geo.modis.stream.data_fetcher	15

skdaccess.geo.modis.stream.reflectance	15
skdaccess.geo.modis.stream.reflectance.data_fetcher	15
skdaccess.geo.pbo	16
skdaccess.geo.pbo.data_fetcher	16
skdaccess.utilities	16
skdaccess.utilities.grace_util	16
skdaccess.utilities.gw_util	18
skdaccess.utilities.kepler_util	19
skdaccess.utilities.modis_util	19
skdaccess.utilities.pbo_util	24

Chapter 2

Hierarchical Index

2.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

skdaccess.framework.param_class.AutoParam	52
skdaccess.framework.param_class.AutoParamList	55
skdaccess.framework.param_class.AutoParamListCycle	58
skdaccess.framework.param_class.AutoParamMinMax	61
MDF	
skdaccess.geo.modis.cache.cloud_mask.DataFetcher	97
skdaccess.geo.modis.cache.cloud_opacity.DataFetcher	98
skdaccess.geo.modis.cache.reflectance.DataFetcher	64
skdaccess.geo.modis.stream.cloud_mask.DataFetcher	109
skdaccess.geo.modis.stream.cloud_opacity.DataFetcher	108
skdaccess.geo.modis.stream.reflectance.DataFetcher	65
object	
skdaccess.framework.data_class.DataFetcherBase	116
skdaccess.framework.data_class.DataFetcherLocal	124
skdaccess.framework.data_class.DataFetcherCache	120
skdaccess.astro.kepler.DataFetcher	91
skdaccess.geo.modis.cache.DataFetcher	100
skdaccess.framework.data_class.DataFetcherStorage	128
skdaccess.geo.gldas.DataFetcher	74
skdaccess.geo.grace.DataFetcher	80
skdaccess.geo.groundwater.DataFetcher	85
skdaccess.geo.pbo.DataFetcher	67
skdaccess.framework.data_class.DataFetcherStream	133
skdaccess.geo.modis.stream.DataFetcher	110
skdaccess.framework.data_class.DataWrapperBase	136
skdaccess.framework.data_class.ImageWrapper	141
skdaccess.framework.data_class.SeriesWrapper	152
skdaccess.framework.data_class.SeriesDictionaryWrapper	148
skdaccess.framework.data_class.TableWrapper	159
skdaccess.framework.param_class.AutoList	31

skdaccess.framework.param_class.AutoListCycle	35
skdaccess.framework.param_class.AutoListPermute	40
skdaccess.framework.param_class.AutoListRemove	44
skdaccess.framework.param_class.AutoListSubset	48
skdaccess.utilities.modis_util.LatLon	145

Chapter 3

Class Index

3.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

skdaccess.framework.param_class.AutoList	
Specifies a list for returning selections of lists, as opposed to a single element	31
skdaccess.framework.param_class.AutoListCycle	
An Autolist that cycles through different lists	35
skdaccess.framework.param_class.AutoListPermute	
A perturber that permutes a list	40
skdaccess.framework.param_class.AutoListRemove	
Removes a different single element from the initial list at each perturb call	44
skdaccess.framework.param_class.AutoListSubset	
An AutoList perturber that creates random subsets of a list	48
skdaccess.framework.param_class.AutoParam	
Defines a tunable parameter class inherited by specific subclasses	52
skdaccess.framework.param_class.AutoParamList	
A tunable parameter with a specified list of choices that can be randomly selected via perturb	55
skdaccess.framework.param_class.AutoParamListCycle	
Cycles through a list of paramters	58
skdaccess.framework.param_class.AutoParamMinMax	
A tunable parameter with min and max ranges, perturbs to a random value in range	61
skdaccess.geo.modis.cache.reflectance.DataFetcher	
Data fetcher for the modis surface reflectance product ('09', 1 km resolution)	64
skdaccess.geo.modis.stream.reflectance.DataFetcher	
Data fetcher for the modis surface reflectance product ('09', 1 km resolution)	65
skdaccess.geo.pbo.DataFetcher	
Data fetcher for PBO GPS data	67
skdaccess.geo.gldas.DataFetcher	
Data Fetcher for GLDAS data	74
skdaccess.geo.grace.DataFetcher	
Data Fetcher for GRACE data	80
skdaccess.geo.groundwater.DataFetcher	
Generates Data Wrappers of groundwater measurements taken in the US	85
skdaccess.astro.kepler.DataFetcher	
Data Fetcher for Kepler light curve data	91

skdaccess.geo.modis.cache.cloud_mask.DataFetcher	
Data Fetcher for MODIS Cloud Mask	97
skdaccess.geo.modis.cache.cloud_opacity.DataFetcher	
Data Fetcher for MODIS Cloud Opacity	98
skdaccess.geo.modis.cache.DataFetcher	
Data Fetcher for MODIS data	100
skdaccess.geo.modis.stream.cloud_opacity.DataFetcher	
Data Fetcher for MODIS Cloud Opacity	108
skdaccess.geo.modis.stream.cloud_mask.DataFetcher	
Data Fetcher for MODIS Cloud Mask	109
skdaccess.geo.modis.stream.DataFetcher	
Data Fetcher for MODIS data	110
skdaccess.framework.data_class.DataFetcherBase	
Base class for all data fetchers	116
skdaccess.framework.data_class.DataFetcherCache	
Data fetcher base class for downloading data and caching results on hard disk	120
skdaccess.framework.data_class.DataFetcherLocal	
Data fetcher base class for use when storing data locally	124
skdaccess.framework.data_class.DataFetcherStorage	
Data fetcher base class for use when entire data set is downloaded	128
skdaccess.framework.data_class.DataFetcherStream	
Data fetcher base class for downloading data into memory	133
skdaccess.framework.data_class.DataWrapperBase	
Base class for wrapping data for use in DiscoveryPipeline	136
skdaccess.framework.data_class.ImageWrapper	
Wrapper for image data	141
skdaccess.utilities.modis_util.LatLon	
Calculates Lat/Lon position from y,x pixel coordinate	145
skdaccess.framework.data_class.SeriesDictionaryWrapper	
Data wrapper for series data using a dictionary of data frames	148
skdaccess.framework.data_class.SeriesWrapper	
Data wrapper for series data using a data panel	152
skdaccess.framework.data_class.TableWrapper	
Data wrapper for table data using an ordered dictionary	159

Chapter 4

File Index

4.1 File List

Here is a list of all files with brief descriptions:

astro/kepler/ data_fetcher.py	167
bin/ skdaccess.py	171
framework/ data_class.py	171
framework/ param_class.py	172
geo/gldas/ data_fetcher.py	167
geo/grace/ data_fetcher.py	167
geo/groundwater/ data_fetcher.py	168
geo/modis/cache/ data_fetcher.py	169
geo/modis/cache/cloud_mask/ data_fetcher.py	168
geo/modis/cache/cloud_opacity/ data_fetcher.py	168
geo/modis/cache/reflectance/ data_fetcher.py	169
geo/modis/stream/ data_fetcher.py	170
geo/modis/stream/cloud_mask/ data_fetcher.py	169
geo/modis/stream/cloud_opacity/ data_fetcher.py	169
geo/modis/stream/reflectance/ data_fetcher.py	170
geo/pbo/ data_fetcher.py	170
utilities/ grace_util.py	172
utilities/ gw_util.py	173
utilities/ kepler_util.py	173
utilities/ modis_util.py	173
utilities/ pbo_util.py	174

Chapter 5

Namespace Documentation

5.1 skdaccess Namespace Reference

Namespaces

- [astro](#)
- [bin](#)
- [framework](#)
- [geo](#)
- [utilities](#)

5.2 skdaccess.astro Namespace Reference

Namespaces

- [kepler](#)

5.3 skdaccess.astro.kepler Namespace Reference

Namespaces

- [data_fetcher](#)

5.4 skdaccess.astro.kepler.data_fetcher Namespace Reference

Classes

- class [DataFetcher](#)

Data Fetcher for Kepler light curve data.

5.5 skdaccess.bin Namespace Reference

Namespaces

- [skdaccess](#)

5.6 skdaccess.bin.skdaccess Namespace Reference

Functions

- def [skdaccess_script](#) ()
This function defines a script for downloading data.

5.6.1 Function Documentation

5.6.1.1 skdaccess_script()

```
def skdaccess.bin.skdaccess.skdaccess_script ( )
```

This function defines a script for downloading data.

5.7 skdaccess.framework Namespace Reference

Namespaces

- [data_class](#)
- [param_class](#)

5.8 skdaccess.framework.data_class Namespace Reference

Classes

- class [DataFetcherBase](#)
Base class for all data fetchers.
- class [DataFetcherCache](#)
Data fetcher base class for downloading data and caching results on hard disk.
- class [DataFetcherLocal](#)
Data fetcher base class for use when storing data locally.
- class [DataFetcherStorage](#)
Data fetcher base class for use when entire data set is downloaded.
- class [DataFetcherStream](#)
Data fetcher base class for downloading data into memory.
- class [DataWrapperBase](#)
Base class for wrapping data for use in DiscoveryPipeline.
- class [ImageWrapper](#)
Wrapper for image data.
- class [SeriesDictionaryWrapper](#)
Data wrapper for series data using a dictionary of data frames.
- class [SeriesWrapper](#)
Data wrapper for series data using a data panel.
- class [TableWrapper](#)
Data wrapper for table data using an ordered dictionary.

5.9 skdaccess.framework.param_class Namespace Reference

Classes

- class [AutoList](#)
Specifies a list for returning selections of lists, as opposed to a single element.
- class [AutoListCycle](#)
An Autolist that cycles through different lists.
- class [AutoListPermute](#)
A perturber that permutes a list.
- class [AutoListRemove](#)
Removes a different single element from the initial list at each perturb call.
- class [AutoListSubset](#)
An [AutoList](#) perturber that creates random subsets of a list.
- class [AutoParam](#)
Defines a tunable parameter class inherited by specific subclasses.
- class [AutoParamList](#)
A tunable parameter with a specified list of choices that can be randomly selected via perturb.
- class [AutoParamListCycle](#)
Cycles through a list of paramters.
- class [AutoParamMinMax](#)
A tunable parameter with min and max ranges, perturbs to a random value in range.

5.10 skdaccess.geo Namespace Reference

Namespaces

- [gldas](#)
- [grace](#)
- [groundwater](#)
- [modis](#)
- [pbo](#)

5.11 skdaccess.geo.gldas Namespace Reference

Namespaces

- [data_fetcher](#)

5.12 skdaccess.geo.gldas.data_fetcher Namespace Reference

Classes

- class [DataFetcher](#)
Data Fetcher for GLDAS data.

5.13 skdaccess.geo.grace Namespace Reference

Namespaces

- [data_fetcher](#)

5.14 skdaccess.geo.grace.data_fetcher Namespace Reference

Classes

- class [DataFetcher](#)
Data Fetcher for GRACE data.

5.15 skdaccess.geo.groundwater Namespace Reference

Namespaces

- [data_fetcher](#)

5.16 skdaccess.geo.groundwater.data_fetcher Namespace Reference

Classes

- class [DataFetcher](#)
Generates Data Wrappers of groundwater measurements taken in the US.

5.17 skdaccess.geo.modis Namespace Reference

Namespaces

- [cache](#)
- [stream](#)

5.18 skdaccess.geo.modis.cache Namespace Reference

Namespaces

- [cloud_mask](#)
- [cloud_opacity](#)
- [data_fetcher](#)
- [reflectance](#)

5.19 skdaccess.geo.modis.cache.cloud_mask Namespace Reference

Namespaces

- [data_fetcher](#)

5.20 skdaccess.geo.modis.cache.cloud_mask.data_fetcher Namespace Reference

Classes

- class [DataFetcher](#)
Data Fetcher for MODIS Cloud Mask.

5.21 skdaccess.geo.modis.cache.cloud_opacity Namespace Reference

Namespaces

- [data_fetcher](#)

5.22 `skdaccess.geo.modis.cache.cloud_opacity.data_fetcher` Namespace Reference

Classes

- class [DataFetcher](#)
Data Fetcher for MODIS Cloud Opacity.

5.23 `skdaccess.geo.modis.cache.data_fetcher` Namespace Reference

Classes

- class [DataFetcher](#)
Data Fetcher for MODIS data.

5.24 `skdaccess.geo.modis.cache.reflectance` Namespace Reference

Namespaces

- [data_fetcher](#)

5.25 `skdaccess.geo.modis.cache.reflectance.data_fetcher` Namespace Reference

Classes

- class [DataFetcher](#)
Data fetcher for the modis surface reflectance product ('09', 1 km resolution)

5.26 `skdaccess.geo.modis.stream` Namespace Reference

Namespaces

- [cloud_mask](#)
- [cloud_opacity](#)
- [data_fetcher](#)
- [reflectance](#)

5.27 `skdaccess.geo.modis.stream.cloud_mask` Namespace Reference

Namespaces

- [data_fetcher](#)

5.28 skdaccess.geo.modis.stream.cloud_mask.data_fetcher Namespace Reference

Classes

- class [DataFetcher](#)
Data Fetcher for MODIS Cloud Mask.

5.29 skdaccess.geo.modis.stream.cloud_opacity Namespace Reference

Namespaces

- [data_fetcher](#)

5.30 skdaccess.geo.modis.stream.cloud_opacity.data_fetcher Namespace Reference

Classes

- class [DataFetcher](#)
Data Fetcher for MODIS Cloud Opacity.

5.31 skdaccess.geo.modis.stream.data_fetcher Namespace Reference

Classes

- class [DataFetcher](#)
Data Fetcher for MODIS data.

5.32 skdaccess.geo.modis.stream.reflectance Namespace Reference

Namespaces

- [data_fetcher](#)

5.33 skdaccess.geo.modis.stream.reflectance.data_fetcher Namespace Reference

Classes

- class [DataFetcher](#)
Data fetcher for the modis surface reflectance product ('09', 1 km resolution)

5.34 skdaccess.geo.pbo Namespace Reference

Namespaces

- [data_fetcher](#)

5.35 skdaccess.geo.pbo.data_fetcher Namespace Reference

Classes

- class [DataFetcher](#)
Data fetcher for PBO GPS data.

5.36 skdaccess.utilities Namespace Reference

Namespaces

- [grace_util](#)
- [gw_util](#)
- [kepler_util](#)
- [modis_util](#)
- [pbo_util](#)

5.37 skdaccess.utilities.grace_util Namespace Reference

Functions

- def [averageDates](#) (dates, round_nearest_day=False)
Compute the average of a pandas series of timestamps.
- def [dateMismatch](#) (dates, days=10)
Check if dates are not within a certain number of days of each other.
- def [computeEWD](#) (grace_data, scale_factor, round_nearest_day=False)
Compute scale corrected equivalent water depth.
- def [readGraceData](#) (filename, lat_name, lon_name, data_name, time=None)
This function reads in netcdf data provided by GRACE Tellus.

5.37.1 Function Documentation

5.37.1.1 averageDates()

```
def skdaccess.utilities.grace_util.averageDates (
    dates,
    round_nearest_day = False )
```

Compute the average of a pandas series of timestamps.

Parameters

<i>dates</i>	Pandas series of pandas datetime objects
<i>round_nearest_day</i>	Round to the nearest day

Returns

Average of dates

5.37.1.2 computeEWD()

```
def skdaccess.utilities.grace_util.computeEWD (
    grace_data,
    scale_factor,
    round_nearest_day = False )
```

Compute scale corrected equivalent water depth.

Equivalent water depth by averaging results from GFZ, CSR, and JPL, and then applying the scale factor

Parameters

<i>grace_data</i>	Data frame containing grace data
<i>scale_factor</i>	Scale factor to apply
<i>round_nearest_day</i>	Round dates to nearest day

Returns

Equivalent water depth determined by applying the scale factor to the average GFZ, JPL and CSR.

5.37.1.3 dateMismatch()

```
def skdaccess.utilities.grace_util.dateMismatch (
    dates,
    days = 10 )
```

Check if dates are not within a certain number of days of each other.

Parameters

<i>dates</i>	Iterable container of pandas timestamps
<i>days</i>	Number of days

Returns

true if they are not with 10 days, false otherwise

5.37.1.4 readGraceData()

```
def skdaccess.utilities.grace_util.readGraceData (
    filename,
    lat_name,
    lon_name,
    data_name,
    time = None )
```

This function reads in netcdf data provided by GRACE Tellus.

Parameters

<i>filename</i>	Name of file to read in
<i>lat_name</i>	Name of latitude data
<i>lon_name</i>	Name of longitude data
<i>data_name</i>	Name of data product
<i>time</i>	Name of time data

5.38 skdaccess.utilities.gw_util Namespace Reference**Functions**

- def [combine_water_heights](#) (in_data)
Combine median and average water heights.

5.38.1 Function Documentation**5.38.1.1 combine_water_heights()**

```
def skdaccess.utilities.gw_util.combine_water_heights (
    in_data )
```

Combine median and average water heights.

Create a column of water heights in input data frame using Median Water Depth by default, but fills in missing data using average values

Parameters

<i>in_data</i>	Input water heights data
----------------	--------------------------

5.39 skdaccess.utilities.kepler_util Namespace Reference

Functions

- def [normalize](#) (in_data, column='PDCSAP_FLUX', group_column='QUARTER')
This function normalizes PDCSAP_FLUX data by quarter by dividing the flux by the median for the quarter.

5.39.1 Function Documentation

5.39.1.1 normalize()

```
def skdaccess.utilities.kepler_util.normalize (
    in_data,
    column = 'PDCSAP_FLUX',
    group_column = 'QUARTER' )
```

This function normalizes PDCSAP_FLUX data by quarter by dividing the flux by the median for the quarter.

Parameters

<i>in_data</i>	Data to be normalized
<i>column</i>	Name of column to be normalized
<i>group_column</i>	Name of column used to group data

5.40 skdaccess.utilities.modis_util Namespace Reference

Classes

- class [LatLon](#)
Calculates Lat/Lon position from y,x pixel coordinate.

Functions

- def [getImageType](#) (in_data)

- Determine what type of modis data is being processed.*

 - def `calibrateModis` (data, metadata)

This function calibrates input modis data.
- def `rescale` (in_array, max_val=0.9, min_val=-0.01)

This function rescales an image to fall between 0 and 1.
- def `checkBit` (data, bit)

Get the bit value from a bit flag.
- def `createGrid` (data, y_start, y_end, x_start, x_end, y_grid, x_grid, dtype, grid_fill=np.nan)

Subsets image data into a smaller image.
- def `getFileIDs` (modis_identifier, start_date, end_date, lat, lon, daynightboth)

Retrieve file IDs for images matching search parameters.
- def `getFileURLs` (file_ids)

Retrieve the ftp location for a list of file IDs.
- def `getModisData` (dataset, variable_name)

Loads modis data.
- def `readMODISData` (modis_list, variables, grid, grid_fill, use_long_name, platform, product_id)

Retrieve a list of modis data.

5.40.1 Function Documentation

5.40.1.1 `calibrateModis()`

```
def skdaccess.utilities.modis_util.calibrateModis (
    data,
    metadata )
```

This function calibrates input modis data.

Parameters

<i>data</i>	Input modis data
<i>metadata</i>	Metadata associated with modis input data

Returns

calibrated modis data

5.40.1.2 `checkBit()`

```
def skdaccess.utilities.modis_util.checkBit (
    data,
    bit )
```

Get the bit value from a bit flag.

Parameters

<i>data</i>	Integer bit flag
<i>bit</i>	Which bit to select (start indexing at 0)

Returns

value of chosen bit in bit flag

5.40.1.3 createGrid()

```
def skdaccess.utilities.modis_util.createGrid (
    data,
    y_start,
    y_end,
    x_start,
    x_end,
    y_grid,
    x_grid,
    dtype,
    grid_fill = np.nan )
```

Subsets image data into a smaller image.

Takes care to make sure the resulting subsection has the expected size by filling in missing data

Parameters

<i>data</i>	Input data
<i>y_start</i>	Starting pixel for y
<i>y_end</i>	Ending pixel for y
<i>x_start</i>	Starting pixel x
<i>x_end</i>	Ending pixel for x
<i>y_grid</i>	Grid size for y
<i>x_grid</i>	Grid size for x
<i>dtype</i>	The dtype of the new grid data
<i>grid_fill</i>	Fill value to use when there is no data

Returns

image subsection, fraction of valid data

5.40.1.4 getFileIDs()

```
def skdaccess.utilities.modis_util.getFileIDs (
    modis_identifier,
    start_date,
    end_date,
    lat,
    lon,
    daynightboth )
```

Retrieve file IDs for images matching search parameters.

Parameters

<i>modis_identifier</i>	Product identifier (e.g. MOD09)
<i>start_date</i>	Starting date
<i>end_date</i>	Ending date
<i>lat</i>	Latitude
<i>lon</i>	Longitude
<i>daynightboth</i>	Get daytime images ('D'), nighttime images ('N') or both ('B')

Returns

list of file IDs

5.40.1.5 getFileURLs()

```
def skdaccess.utilities.modis_util.getFileURLs (
    file_ids )
```

Retrieve the ftp location for a list of file IDs.

Parameters

<i>file_ids</i>	List of file IDs
-----------------	------------------

Returns

List of ftp locations

5.40.1.6 getImageType()

```
def skdaccess.utilities.modis_util.getImageType (  
    in_data )
```

Determine what type of modis data is being processed.

There are 3 array shapes we deal with:

```
mode 1 -> (y, x, z)  
mode 2 -> (y, x)  
mode 3 -> (z, y ,x)
```

where z axis represents different data products and y and x correspond to the y and x image coordinates from the modis instrument

Parameters

<i>in_data</i>	Input modis data
----------------	------------------

Returns

type of modis data

5.40.1.7 getModisData()

```
def skdaccess.utilities.modis_util.getModisData (  
    dataset,  
    variable_name )
```

Loads modis data.

Parameters

<i>dataset</i>	netCDF4 dataset
<i>variable_name</i>	Name of variable to extract from dataset

Returns

(modis_data, metadata)

5.40.1.8 readMODISData()

```
def skdaccess.utilities.modis_util.readMODISData (
    modis_list,
    variables,
    grid,
    grid_fill,
    use_long_name,
    platform,
    product_id )
```

Retrieve a list of modis data.

Parameters

<i>modis_list</i>	List of MODIS data to load
<i>variables</i>	List of variables in the MODIS data to load
<i>grid</i>	Further divide each image into a multiple grids of size (y,x)
<i>grid_fill</i>	Fill value to use when creating gridded data
<i>use_long_name</i>	Use long names for metadata instead of variable name
<i>platform</i>	Which satellite to use, either MOD or MYD.
<i>product_id</i>	Product string (e.g. '06_L2')

5.40.1.9 rescale()

```
def skdaccess.utilities.modis_util.rescale (
    in_array,
    max_val = 0.9,
    min_val = -0.01 )
```

This function rescales an image to fall between 0 and 1.

Parameters

<i>in_array</i>	Data to be rescaled
<i>max_val</i>	Values greater than or equal to max_val will become 1
<i>min_val</i>	Values less than or equal to min_val will become 0

Returns

scaled data

5.41 skdaccess.utilities.pbo_util Namespace Reference

Functions

- def [getStationCoords](#) (pbo_info, station_list)
Get the station coordinates for a list of stations.
- def [getLatLonRange](#) (pbo_info, station_list)
Retrive the range of latitude and longitude occupied by a set of stations.
- def [getROIstations](#) (geo_point, radiusParam, data, header)
This function returns the 4ID station codes for the stations in a region.
- def [stab_sys](#) (data_iterator, metadata, stab_min_NE=.0005, stab_min_U=.005, sigsc=2, errProp=1)
Stabilize GPS data to a region.
- def [propagateErrors](#) (R, sc, stationCovs)
Propagate GPS errors.
- def [nostab_sys](#) (allH, allD, timerng, indx=1, mdyratio=.7, use_progress_bar=True)
Do not apply stabilization and simply returns stations after checking for sufficient amount of data.
- def [removeAntennaOffset](#) (antenna_offsets, data, window_start=pd.to_timedelta('4D'), window_end=pd.to_timedelta('4D'), min_diff=0.005, debug=False)
Remove offsets caused by changes in antennas.

5.41.1 Function Documentation

5.41.1.1 [getLatLonRange\(\)](#)

```
def skdaccess.utilities.pbo_util.getLatLonRange (
    pbo_info,
    station_list )
```

Retrive the range of latitude and longitude occupied by a set of stations.

Parameters

<i>pbo_info</i>	PBO Metadata
<i>station_list</i>	List of stations

Returns

list containg two tuples, lat_range and lon_range

5.41.1.2 [getROIstations\(\)](#)

```
def skdaccess.utilities.pbo_util.getROIstations (
    geo_point,
```

```

    radiusParam,
    data,
    header )

```

This function returns the 4ID station codes for the stations in a region.

The region of interest is defined by the geographic coordinate and a window size

Parameters

<i>geo_point</i>	The geographic (lat,lon) coordinate of interest
<i>radiusParam</i>	An overloaded radius of interest [km] or latitude and longitude window [deg] around the <i>geo_point</i>
<i>data</i>	Stabilized (or unstabilized) data generated from the data fetcher or out of <i>stab_sys</i>
<i>header</i>	Header dictionary with stations metadata keyed by their 4ID code. This is output with the data.

Returns

station_list, list of site 4ID codes in the specified geographic region

5.41.1.3 getStationCoords()

```

def skdaccess.utilities.pbo_util.getStationCoords (
    pbo_info,
    station_list )

```

Get the station coordinates for a list of stations.

Parameters

<i>pbo_info</i>	PBO Metadata
<i>station_list</i>	List of stations

Returns

list of tuples containing lat, lon coordinates of stations

5.41.1.4 nostab_sys()

```

def skdaccess.utilities.pbo_util.nostab_sys (
    allH,
    allD,

```

```

    timerng,
    indx = 1,
    mdyratio = .7,
    use_progress_bar = True )

```

Do not apply stabilization and simply returns stations after checking for sufficient amount of data.

Parameters

<i>allH</i>	a dictionary of all of the headers of all sites loaded from the data directory
<i>allD</i>	a dictionary of all of the panda format data of all of the corresponding sites
<i>timerng</i>	an array with two string elements, describing the starting and ending dates
<i>indx</i>	a list of site 4ID's indicating stations in the relevant geographic location, or 1 for all sites
<i>mdyratio</i>	optional parameter for the minimum required ratio of data to determine if a site is kept for further analysis

Returns

smSet, a reduced size dictionary of the data (in meters) for the sites in the specified geographic region and smHdr, a reduced size dictionary of the headers for the sites in the region

5.41.1.5 propagateErrors()

```

def skdaccess.utilities.pbo_util.propagateErrors (
    R,
    sc,
    stationCovs )

```

Propagate GPS errors.

By writing out the $R \cdot E \cdot R.T$ equations... to calculate the new covariance matrix without needing to form the matrix first as an intermediate step. Modifies covariance matrix in place

Parameters

<i>R</i>	Rotation matrix
<i>sc</i>	Scaling value
<i>stationCovs</i>	Station Covariances

5.41.1.6 removeAntennaOffset()

```

def skdaccess.utilities.pbo_util.removeAntennaOffset (
    antenna_offsets,

```

```

data,
window_start = pd.to_timedelta('4D'),
window_end = pd.to_timedelta('4D'),
min_diff = 0.005,
debug = False )

```

Remove offsets caused by changes in antennas.

Parameters

<i>antenna_offsets</i>	Pandas series of dates describing when the antenna changes were made
<i>data</i>	Input GPS data
<i>window_start</i>	Starting time before and after event to use for calculating offset
<i>window_end</i>	Ending time before and after event to use before calculating offset
<i>min_diff</i>	Minimum difference before and after offset to for applying correction
<i>debug</i>	Enable debug output

Returns

GPS data with the offsets removed

5.41.1.7 stab_sys()

```

def skdaccess.utilities.pbo_util.stab_sys (
    data_iterator,
    metadata,
    stab_min_NE = .0005,
    stab_min_U = .005,
    sigsc = 2,
    errProp = 1 )

```

Stabilize GPS data to a region.

The `stab_sys` function is a Python implementation of the Helmert 7-parameter transformation, used to correct for common mode error. This builds on Prof Herring's `stab_sys` function in his `tscon` Fortran code. It uses a SVD approach to estimating the rotation matrix gathered from 'Computing Helmert Transformations' by G.A. Watson as well as its references. Note that units should be in meters, that is in the format from the level 2 processed UNAVCO pos files

Parameters

<i>data_iterator</i>	Expects an iterator that returns label, pandas dataframe
<i>metadata</i>	Metadata that contains 'refXYZ' and 'refNEU'
<i>stab_min_NE</i>	Optional minimum horizontal covariance parameter
<i>stab_min_U</i>	Optional minimum vertical covariance parameter
<i>sigsc</i>	Optional scaling factor for determining cutoff bounds for non stable sites
<i>errProp</i>	Propagate errors through the transformation

Returns

smSet, a reduced size dictionary of the data (in mm) for the sites in the specified geographic region, smHdr, a reduced size dictionary of the headers for the sites in the region

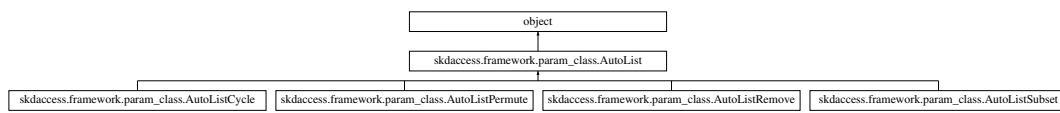
Chapter 6

Class Documentation

6.1 skdaccess.framework.param_class.AutoList Class Reference

Specifies a list for returning selections of lists, as opposed to a single element.

Inheritance diagram for skdaccess.framework.param_class.AutoList:



Public Member Functions

- def `__init__` (self, `val_list`)
Construct a `AutoList` object.
- def `val` (self)
Retrieves current list of parameters.
- def `perturb` (self)
This class doesn't change the list when being perturbed.
- def `reset` (self)
Reset current list to initial list.
- def `getAllOptions` (self)
Get all possible options.
- def `__str__` (self)
String representation of class.
- def `__len__` (self)
Retrieves the length of parameters contained in the list.
- def `__getitem__` (self, ii)
Retrieves item from list.
- def `__setitem__` (self, ii, `val`)
Set a value in the list.
- def `__call__` (self)
Retrieve current list.

Public Attributes

- [val_init](#)
- [val_list](#)

6.1.1 Detailed Description

Specifies a list for returning selections of lists, as opposed to a single element.

6.1.2 Constructor & Destructor Documentation

6.1.2.1 `__init__()`

```
def skdaccess.framework.param_class.AutoList.__init__ (
    self,
    val_list )
```

Construct a [AutoList](#) object.

Parameters

<i>val_list</i>	List of parameters
-----------------	--------------------

6.1.3 Member Function Documentation

6.1.3.1 `__call__()`

```
def skdaccess.framework.param_class.AutoList.__call__ (
    self )
```

Retrieve current list.

Returns

Current list

6.1.3.2 `__getitem__()`

```
def skdaccess.framework.param_class.AutoList.__getitem__ (
    self,
    ii )
```

Retrieves item from list.

Parameters

<i>ii</i>	Index of item to be retrieved
-----------	-------------------------------

Returns

Item at index ii

6.1.3.3 `__len__()`

```
def skdaccess.framework.param_class.AutoList.__len__ (
    self )
```

Retrieves the length of parameters contained in the list.

Returns

Number of elements in the list

6.1.3.4 `__setitem__()`

```
def skdaccess.framework.param_class.AutoList.__setitem__ (
    self,
    ii,
    val )
```

Set a value in the list.

Parameters

<i>ii</i>	Index of list to be set
<i>val</i>	Input value

6.1.3.5 `__str__()`

```
def skdaccess.framework.param_class.AutoList.__str__ (
    self )
```

String representation of class.

Returns

String containing all parameters in list

6.1.3.6 `getAllOptions()`

```
def skdaccess.framework.param_class.AutoList.getAllOptions (
    self )
```

Get all possible options.

Returns

List that contains every option that could possibly be selected

6.1.3.7 `perturb()`

```
def skdaccess.framework.param_class.AutoList.perturb (
    self )
```

This class doesn't change the list when being perturbed.

6.1.3.8 `reset()`

```
def skdaccess.framework.param_class.AutoList.reset (
    self )
```

Reset current list to initial list.

6.1.3.9 val()

```
def skdaccess.framework.param_class.AutoList.val (
    self )
```

Retrieves current list of parameters.

Returns

List of current parameters

6.1.4 Member Data Documentation

6.1.4.1 val_init

```
skdaccess.framework.param_class.AutoList.val_init
```

6.1.4.2 val_list

```
skdaccess.framework.param_class.AutoList.val_list
```

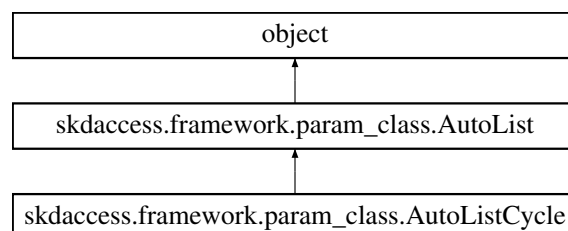
The documentation for this class was generated from the following file:

- framework/[param_class.py](#)

6.2 skdaccess.framework.param_class.AutoListCycle Class Reference

An Autolist that cycles through different lists.

Inheritance diagram for skdaccess.framework.param_class.AutoListCycle:



Public Member Functions

- def `__init__` (self, `list_val_list`)
Construct a `AutoList_Cycle` object.
- def `perturb` (self)
Select next list from list of lists.
- def `reset` (self)
Resets to the first list in the list of lists.
- def `getAllOptions` (self)
Get elements that could possibly be called.
- def `val` (self)
Retrieves current list of parameters.
- def `__str__` (self)
String representation of class.
- def `__len__` (self)
Retrieves the length of parameters contained in the list.
- def `__getitem__` (self, ii)
Retrieves item from list.
- def `__setitem__` (self, ii, `val`)
Set a value in the list.
- def `__call__` (self)
Retrieve current list.

Public Attributes

- `list_val_list`
- `val_list`
- `index`
- `val_init`

6.2.1 Detailed Description

An Autolist that cycles through different lists.

6.2.2 Constructor & Destructor Documentation

6.2.2.1 `__init__()`

```
def skdaccess.framework.param_class.AutoListCycle.__init__ (
    self,
    list_val_list )
```

Construct a `AutoList_Cycle` object.

Parameters

<i>list_val_list</i>	List of different lists to cycle through
----------------------	--

6.2.3 Member Function Documentation**6.2.3.1 __call__()**

```
def skdaccess.framework.param_class.AutoList.__call__ (
    self ) [inherited]
```

Retrieve current list.

Returns

Current list

6.2.3.2 __getitem__()

```
def skdaccess.framework.param_class.AutoList.__getitem__ (
    self,
    ii ) [inherited]
```

Retrieves item from list.

Parameters

<i>ii</i>	Index of item to be retrieved
-----------	-------------------------------

Returns

Item at index ii

6.2.3.3 __len__()

```
def skdaccess.framework.param_class.AutoList.__len__ (
    self ) [inherited]
```

Retrieves the length of parameters contained in the list.

Returns

Number of elements in the list

6.2.3.4 __setitem__()

```
def skdaccess.framework.param_class.AutoList.__setitem__ (
    self,
    ii,
    val ) [inherited]
```

Set a value in the list.

Parameters

<i>ii</i>	Index of list to be set
<i>val</i>	Input value

6.2.3.5 __str__()

```
def skdaccess.framework.param_class.AutoList.__str__ (
    self ) [inherited]
```

String representation of class.

Returns

String containing all parmaters in list

6.2.3.6 getAllOptions()

```
def skdaccess.framework.param_class.AutoListCycle.getAllOptions (
    self )
```

Get elements that could possibly be called.

Returns

List of all possible elements

6.2.3.7 perturb()

```
def skdaccess.framework.param_class.AutoListCycle.perturb (  
    self )
```

Select next list from list of lists.

6.2.3.8 reset()

```
def skdaccess.framework.param_class.AutoListCycle.reset (  
    self )
```

Resets to the first list in the list of lists.

6.2.3.9 val()

```
def skdaccess.framework.param_class.AutoList.val (  
    self ) [inherited]
```

Retrieves current list of parameters.

Returns

List of current parameters

6.2.4 Member Data Documentation

6.2.4.1 index

```
skdaccess.framework.param_class.AutoListCycle.index
```

6.2.4.2 list_val_list

```
skdaccess.framework.param_class.AutoListCycle.list_val_list
```

6.2.4.3 val_init

`skdaccess.framework.param_class.AutoList.val_init` [inherited]

6.2.4.4 val_list

`skdaccess.framework.param_class.AutoListCycle.val_list`

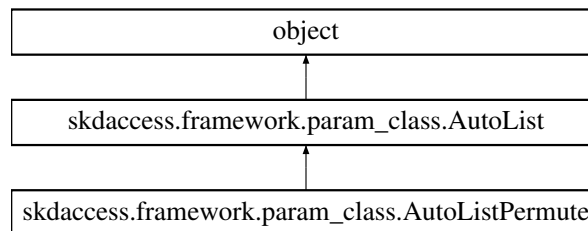
The documentation for this class was generated from the following file:

- [framework/param_class.py](#)

6.3 skdaccess.framework.param_class.AutoListPermute Class Reference

A perturber that permutes a list.

Inheritance diagram for `skdaccess.framework.param_class.AutoListPermute`:



Public Member Functions

- `def perturb (self)`
Randomly permutes the initial list.
- `def val (self)`
Retrieves current list of parameters.
- `def reset (self)`
Reset current list to initial list.
- `def getAllOptions (self)`
Get all possible options.
- `def __str__ (self)`
String representation of class.
- `def __len__ (self)`
Retrieves the length of parameters contained in the list.
- `def __getitem__ (self, ii)`
Retrieves item from list.
- `def __setitem__ (self, ii, val)`
Set a value in the list.
- `def __call__ (self)`
Retrieve current list.

Public Attributes

- [val_init](#)
- [val_list](#)

6.3.1 Detailed Description

A perturber that permutes a list.

6.3.2 Member Function Documentation

6.3.2.1 `__call__()`

```
def skdaccess.framework.param_class.AutoList.__call__ (
    self ) [inherited]
```

Retrieve current list.

Returns

Current list

6.3.2.2 `__getitem__()`

```
def skdaccess.framework.param_class.AutoList.__getitem__ (
    self,
    ii ) [inherited]
```

Retrieves item from list.

Parameters

<i>ii</i>	Index of item to be retrieved
-----------	-------------------------------

Returns

Item at index ii

6.3.2.3 `__len__()`

```
def skdaccess.framework.param_class.AutoList.__len__ (
    self ) [inherited]
```

Retrieves the length of parameters contained in the list.

Returns

Number of elements in the list

6.3.2.4 `__setitem__()`

```
def skdaccess.framework.param_class.AutoList.__setitem__ (
    self,
    ii,
    val ) [inherited]
```

Set a value in the list.

Parameters

<i>ii</i>	Index of list to be set
<i>val</i>	Input value

6.3.2.5 `__str__()`

```
def skdaccess.framework.param_class.AutoList.__str__ (
    self ) [inherited]
```

String representation of class.

Returns

String containing all parmaters in list

6.3.2.6 getAllOptions()

```
def skdaccess.framework.param_class.AutoList.getAllOptions (
    self ) [inherited]
```

Get all possible options.

Returns

List that contains every option that could possibly be selected

6.3.2.7 perturb()

```
def skdaccess.framework.param_class.AutoListPermute.perturb (
    self )
```

Randomly permutes the initial list.

6.3.2.8 reset()

```
def skdaccess.framework.param_class.AutoList.reset (
    self ) [inherited]
```

Reset current list to initial list.

6.3.2.9 val()

```
def skdaccess.framework.param_class.AutoList.val (
    self ) [inherited]
```

Retrieves current list of parameters.

Returns

List of current parameters

6.3.3 Member Data Documentation

6.3.3.1 val_init

`skdaccess.framework.param_class.AutoList.val_init` [inherited]

6.3.3.2 val_list

`skdaccess.framework.param_class.AutoList.val_list` [inherited]

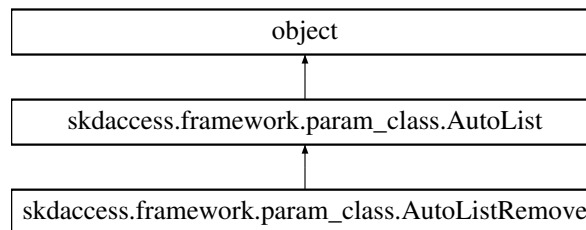
The documentation for this class was generated from the following file:

- [framework/param_class.py](#)

6.4 skdaccess.framework.param_class.AutoListRemove Class Reference

Removes a different single element from the initial list at each perturb call.

Inheritance diagram for `skdaccess.framework.param_class.AutoListRemove`:



Public Member Functions

- `def __init__ (self, val_list)`
Construct a AutoList_Cycle object.
- `def perturb (self)`
Systematically change which item is absent from the list.
- `def reset (self)`
Reset the list to its initial value.
- `def val (self)`
Retrieves current list of parameters.
- `def getAllOptions (self)`
Get all possible options.
- `def __str__ (self)`
String representation of class.
- `def __len__ (self)`
Retrieves the length of parameters contained in the list.
- `def __getitem__ (self, ii)`
Retrieves item from list.
- `def __setitem__ (self, ii, val)`
Set a value in the list.
- `def __call__ (self)`
Retrieve current list.

Public Attributes

- `n`
- `val_list`
- `val_init`

6.4.1 Detailed Description

Removes a different single element from the initial list at each perturb call.

6.4.2 Constructor & Destructor Documentation

6.4.2.1 `__init__()`

```
def skdaccess.framework.param_class.AutoListRemove.__init__ (
    self,
    val_list )
```

Construct a AutoList_Cycle object.

Parameters

<code>val_list</code>	Initial list of parameters.
-----------------------	-----------------------------

6.4.3 Member Function Documentation

6.4.3.1 `__call__()`

```
def skdaccess.framework.param_class.AutoList.__call__ (
    self ) [inherited]
```

Retrieve current list.

Returns

Current list

6.4.3.2 `__getitem__()`

```
def skdaccess.framework.param_class.AutoList.__getitem__ (
    self,
    ii ) [inherited]
```

Retrieves item from list.

Parameters

<i>ii</i>	Index of item to be retrieved
-----------	-------------------------------

Returns

Item at index *ii*

6.4.3.3 `__len__()`

```
def skdaccess.framework.param_class.AutoList.__len__ (
    self ) [inherited]
```

Retrieves the length of parameters contained in the list.

Returns

Number of elements in the list

6.4.3.4 `__setitem__()`

```
def skdaccess.framework.param_class.AutoList.__setitem__ (
    self,
    ii,
    val ) [inherited]
```

Set a value in the list.

Parameters

<i>ii</i>	Index of list to be set
<i>val</i>	Input value

6.4.3.5 `__str__()`

```
def skdaccess.framework.param_class.AutoList.__str__ (
    self ) [inherited]
```

String representation of class.

Returns

String containing all parameters in list

6.4.3.6 `getAllOptions()`

```
def skdaccess.framework.param_class.AutoList.getAllOptions (
    self ) [inherited]
```

Get all possible options.

Returns

List that contains every option that could possibly be selected

6.4.3.7 `perturb()`

```
def skdaccess.framework.param_class.AutoListRemove.perturb (
    self )
```

Systematically change which item is absent from the list.

6.4.3.8 `reset()`

```
def skdaccess.framework.param_class.AutoListRemove.reset (
    self )
```

Reset the list to its initial value.

6.4.3.9 val()

```
def skdaccess.framework.param_class.AutoList.val (
    self ) [inherited]
```

Retrieves current list of parameters.

Returns

List of current parameters

6.4.4 Member Data Documentation

6.4.4.1 n

```
skdaccess.framework.param_class.AutoListRemove.n
```

6.4.4.2 val_init

```
skdaccess.framework.param_class.AutoList.val_init [inherited]
```

6.4.4.3 val_list

```
skdaccess.framework.param_class.AutoListRemove.val_list
```

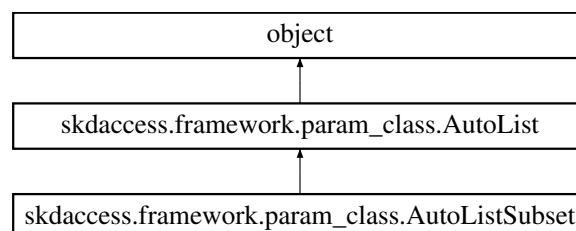
The documentation for this class was generated from the following file:

- [framework/param_class.py](#)

6.5 skdaccess.framework.param_class.AutoListSubset Class Reference

An [AutoList](#) perturber that creates random subsets of a list.

Inheritance diagram for `skdaccess.framework.param_class.AutoListSubset`:



Public Member Functions

- def [perturb](#) (self)
Perturb the list by selecting a random subset of the initial list.
- def [val](#) (self)
Retrieves current list of parameters.
- def [reset](#) (self)
Reset current list to initial list.
- def [getAllOptions](#) (self)
Get all possible options.
- def [__str__](#) (self)
String representation of class.
- def [__len__](#) (self)
Retrieves the length of parameters contained in the list.
- def [__getitem__](#) (self, ii)
Retrieves item from list.
- def [__setitem__](#) (self, ii, [val](#))
Set a value in the list.
- def [__call__](#) (self)
Retrieve current list.

Public Attributes

- [val_list](#)
- [val_init](#)

6.5.1 Detailed Description

An [AutoList](#) perturber that creates random subsets of a list.

List can be empty

6.5.2 Member Function Documentation

6.5.2.1 [__call__](#)()

```
def skdaccess.framework.param_class.AutoList.__call__ (
    self ) [inherited]
```

Retrieve current list.

Returns

Current list

6.5.2.2 `__getitem__()`

```
def skdaccess.framework.param_class.AutoList.__getitem__ (
    self,
    ii ) [inherited]
```

Retrieves item from list.

Parameters

<i>ii</i>	Index of item to be retrieved
-----------	-------------------------------

Returns

Item at index *ii*

6.5.2.3 `__len__()`

```
def skdaccess.framework.param_class.AutoList.__len__ (
    self ) [inherited]
```

Retrieves the length of parameters contained in the list.

Returns

Number of elements in the list

6.5.2.4 `__setitem__()`

```
def skdaccess.framework.param_class.AutoList.__setitem__ (
    self,
    ii,
    val ) [inherited]
```

Set a value in the list.

Parameters

<i>ii</i>	Index of list to be set
<i>val</i>	Input value

6.5.2.5 `__str__()`

```
def skdaccess.framework.param_class.AutoList.__str__ (
    self ) [inherited]
```

String representation of class.

Returns

String containing all parameters in list

6.5.2.6 `getAllOptions()`

```
def skdaccess.framework.param_class.AutoList.getAllOptions (
    self ) [inherited]
```

Get all possible options.

Returns

List that contains every option that could possibly be selected

6.5.2.7 `perturb()`

```
def skdaccess.framework.param_class.AutoListSubset.perturb (
    self )
```

Perturb the list by selecting a random subset of the initial list.

6.5.2.8 `reset()`

```
def skdaccess.framework.param_class.AutoList.reset (
    self ) [inherited]
```

Reset current list to initial list.

6.5.2.9 val()

```
def skdaccess.framework.param_class.AutoList.val (
    self ) [inherited]
```

Retrieves current list of parameters.

Returns

List of current parameters

6.5.3 Member Data Documentation

6.5.3.1 val_init

```
skdaccess.framework.param_class.AutoList.val_init [inherited]
```

6.5.3.2 val_list

```
skdaccess.framework.param_class.AutoListSubset.val_list
```

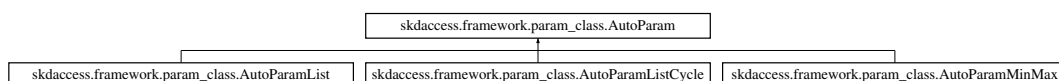
The documentation for this class was generated from the following file:

- [framework/param_class.py](#)

6.6 skdaccess.framework.param_class.AutoParam Class Reference

Defines a tunable parameter class inherited by specific subclasses.

Inheritance diagram for skdaccess.framework.param_class.AutoParam:



Public Member Functions

- def `__init__` (self, `val_init`)
Initialize an [AutoParam](#) object.
- def `perturb` (self)
Perturb paramter.
- def `reset` (self)
Reset value to initial value.
- def `__str__` (self)
String representation of class.
- def `__call__` (self)
Retrieves current value of the parameter.

Public Attributes

- `val`
- `val_init`

6.6.1 Detailed Description

Defines a tunable parameter class inherited by specific subclasses.

[AutoParam](#) class and subclass work on a single value. functions perturb value and reset to initial value

6.6.2 Constructor & Destructor Documentation

6.6.2.1 `__init__()`

```
def skdaccess.framework.param_class.AutoParam.__init__ (  
    self,  
    val_init )
```

Initialize an [AutoParam](#) object.

Parameters

<code>val_init</code>	Value for parameter
-----------------------	---------------------

6.6.3 Member Function Documentation

6.6.3.1 `__call__()`

```
def skdaccess.framework.param_class.AutoParam.__call__ (
    self )
```

Retrieves current value of the parameter.

Returns

Current value of the parameter

6.6.3.2 `__str__()`

```
def skdaccess.framework.param_class.AutoParam.__str__ (
    self )
```

String representation of class.

Returns

String of current value

6.6.3.3 `perturb()`

```
def skdaccess.framework.param_class.AutoParam.perturb (
    self )
```

Perturb paramter.

This class doesn't change the value.

6.6.3.4 `reset()`

```
def skdaccess.framework.param_class.AutoParam.reset (
    self )
```

Reset value to initial value.

6.6.4 Member Data Documentation

6.6.4.1 val

`skdaccess.framework.param_class.AutoParam.val`

6.6.4.2 val_init

`skdaccess.framework.param_class.AutoParam.val_init`

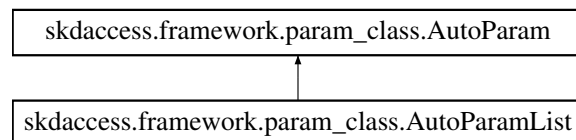
The documentation for this class was generated from the following file:

- [framework/param_class.py](#)

6.7 skdaccess.framework.param_class.AutoParamList Class Reference

A tunable parameter with a specified list of choices that can be randomly selected via perturb.

Inheritance diagram for `skdaccess.framework.param_class.AutoParamList`:



Public Member Functions

- `def __init__(self, val_init, val_list)`
Construct an [AutoParamList](#) object.
- `def perturb(self)`
Randomly select a value from val_list.
- `def reset(self)`
Reset the list to the default value.
- `def __str__(self)`
String representation of class.
- `def __call__(self)`
Retrieves current value of the parameter.

Public Attributes

- [val](#)
- [val_init](#)
- [val_list](#)

6.7.1 Detailed Description

A tunable parameter with a specified list of choices that can be randomly selected via perturb.

6.7.2 Constructor & Destructor Documentation

6.7.2.1 `__init__()`

```
def skdaccess.framework.param_class.AutoParamList.__init__ (
    self,
    val_init,
    val_list )
```

Construct an [AutoParamList](#) object.

Parameters

<i>val_init</i>	initial value for the parameter
<i>val_list</i>	List of possible variants for the parameter

6.7.3 Member Function Documentation

6.7.3.1 `__call__()`

```
def skdaccess.framework.param_class.AutoParam.__call__ (
    self ) [inherited]
```

Retrieves current value of the parameter.

Returns

Current value of the parameter

6.7.3.2 `__str__()`

```
def skdaccess.framework.param_class.AutoParam.__str__ (
    self ) [inherited]
```

String representation of class.

Returns

String of current value

6.7.3.3 `perturb()`

```
def skdaccess.framework.param_class.AutoParamList.perturb (
    self )
```

Randomly select a value from `val_list`.

6.7.3.4 `reset()`

```
def skdaccess.framework.param_class.AutoParamList.reset (
    self )
```

Reset the list to the default value.

6.7.4 Member Data Documentation

6.7.4.1 `val`

```
skdaccess.framework.param_class.AutoParamList.val
```

6.7.4.2 `val_init`

```
skdaccess.framework.param_class.AutoParamList.val_init
```

6.7.4.3 val_list

`skdaccess.framework.param_class.AutoParamList.val_list`

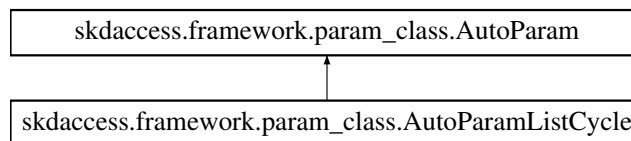
The documentation for this class was generated from the following file:

- [framework/param_class.py](#)

6.8 skdaccess.framework.param_class.AutoParamListCycle Class Reference

Cycles through a list of paramters.

Inheritance diagram for `skdaccess.framework.param_class.AutoParamListCycle`:



Public Member Functions

- `def __init__(self, val_list)`
Construct an [AutoParamListCycle](#).
- `def perturb(self)`
Select the next value from the list of parameters.
- `def reset(self)`
Reset the list to the default values.
- `def __str__(self)`
String representation of class.
- `def __call__(self)`
Retrieves current value of the parameter.

Public Attributes

- `val`
- `val_list`
- `current_index`
- `val_init`

6.8.1 Detailed Description

Cycles through a list of paramters.

6.8.2 Constructor & Destructor Documentation

6.8.2.1 __init__()

```
def skdaccess.framework.param_class.AutoParamListCycle.__init__ (
    self,
    val_list )
```

Construct an [AutoParamListCycle](#).

Parameters

<i>val_list</i>	List of possible variants for the parameter
-----------------	---

6.8.3 Member Function Documentation

6.8.3.1 __call__()

```
def skdaccess.framework.param_class.AutoParam.__call__ (
    self ) [inherited]
```

Retrieves current value of the parameter.

Returns

Current value of the parameter

6.8.3.2 __str__()

```
def skdaccess.framework.param_class.AutoParam.__str__ (
    self ) [inherited]
```

String representation of class.

Returns

String of current value

6.8.3.3 perturb()

```
def skdaccess.framework.param_class.AutoParamListCycle.perturb (
    self )
```

Select the next value from the list of parameters.

6.8.3.4 reset()

```
def skdaccess.framework.param_class.AutoParamListCycle.reset (
    self )
```

Reset the list to the default values.

6.8.4 Member Data Documentation

6.8.4.1 current_index

```
skdaccess.framework.param_class.AutoParamListCycle.current_index
```

6.8.4.2 val

```
skdaccess.framework.param_class.AutoParamListCycle.val
```

6.8.4.3 val_init

```
skdaccess.framework.param_class.AutoParam.val_init [inherited]
```

6.8.4.4 val_list

```
skdaccess.framework.param_class.AutoParamListCycle.val_list
```

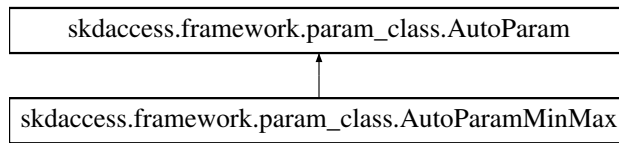
The documentation for this class was generated from the following file:

- framework/[param_class.py](#)

6.9 skdaccess.framework.param_class.AutoParamMinMax Class Reference

A tunable parameter with min and max ranges, perturbs to a random value in range.

Inheritance diagram for skdaccess.framework.param_class.AutoParamMinMax:



Public Member Functions

- def `__init__` (self, `val_init`, `val_min`, `val_max`, `decimals`=0, `extreme`=0)
Construct `AutoParamMinMax` object.
- def `perturb` (self)
Perturb the parameter by choosing a random value between `val_min` and `val_max`.
- def `reset` (self)
Reset to initial value.
- def `__str__` (self)
String representation of class.
- def `__call__` (self)
Retrieves current value of the parameter.

Public Attributes

- `val`
- `val_init`
- `val_min`
- `val_max`
- `n`
- `n_max`
- `decimals`

6.9.1 Detailed Description

A tunable parameter with min and max ranges, perturbs to a random value in range.

It can optionally choose either the min or the max after `n` perturbs

6.9.2 Constructor & Destructor Documentation

6.9.2.1 `__init__()`

```
def skdaccess.framework.param_class.AutoParamMinMax.__init__ (
    self,
    val_init,
    val_min,
    val_max,
    decimals = 0,
    extreme = 0 )
```

Construct [AutoParamMinMax](#) object.

Parameters

<i>val_init</i>	Initial value for parameter
<i>val_min</i>	Minimum value for param
<i>val_max</i>	Maximum value for parameter
<i>decimals</i>	Number of decimals to include in the random number
<i>extreme</i>	Either the maximum or minimum is chosen every extreme number of iterations. Using a value of one will be an extreme value every time. Using a value of zero will always choose a random value.

6.9.3 Member Function Documentation

6.9.3.1 `__call__()`

```
def skdaccess.framework.param_class.AutoParam.__call__ (
    self ) [inherited]
```

Retrieves current value of the parameter.

Returns

Current value of the parameter

6.9.3.2 `__str__()`

```
def skdaccess.framework.param_class.AutoParam.__str__ (
    self ) [inherited]
```

String representation of class.

Returns

String of current value

6.9.3.3 perturb()

```
def skdaccess.framework.param_class.AutoParamMinMax.perturb (
    self )
```

Perturb the parameter by choosing a random value between val_min and val_max.

Will choose a random number with precision specified by decimals. Will optionally pick the min or the max value after a specified number of perturb calls

6.9.3.4 reset()

```
def skdaccess.framework.param_class.AutoParamMinMax.reset (
    self )
```

Reset to initial value.

6.9.4 Member Data Documentation

6.9.4.1 decimals

```
skdaccess.framework.param_class.AutoParamMinMax.decimals
```

6.9.4.2 n

```
skdaccess.framework.param_class.AutoParamMinMax.n
```

6.9.4.3 n_max

```
skdaccess.framework.param_class.AutoParamMinMax.n_max
```

6.9.4.4 val

```
skdaccess.framework.param_class.AutoParamMinMax.val
```

6.9.4.5 val_init

```
skdaccess.framework.param_class.AutoParamMinMax.val_init
```

6.9.4.6 val_max

```
skdaccess.framework.param_class.AutoParamMinMax.val_max
```

6.9.4.7 val_min

```
skdaccess.framework.param_class.AutoParamMinMax.val_min
```

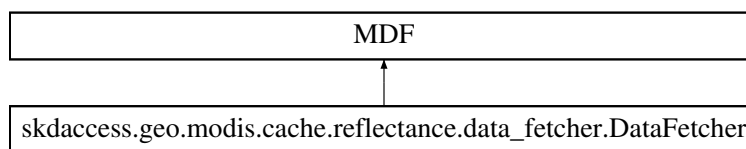
The documentation for this class was generated from the following file:

- framework/[param_class.py](#)

6.10 skdaccess.geo.modis.cache.reflectance.DataFetcher Class Reference

Data fetcher for the modis surface reflectance product ('09', 1 km resolution)

Inheritance diagram for skdaccess.geo.modis.cache.reflectance.DataFetcher:



Public Member Functions

- `def __init__(self, ap_paramList, start_date, end_date, modis_platform='Terra', daynightboth='D', grid=None, bands=[1])`
Construct Data Fetcher for MODIS 1km surface reflectance.

6.10.1 Detailed Description

Data fetcher for the modis surface reflectance product ('09', 1 km resolution)

6.10.2 Constructor & Destructor Documentation

6.10.2.1 __init__()

```
def skdaccess.geo.modis.cache.reflectance.DataFetcher.__init__ (
    self,
    ap_paramList,
    start_date,
    end_date,
    modis_platform = 'Terra',
    daynightboth = 'D',
    grid = None,
    bands = [1 ]
```

Construct Data Fetcher for MODIS 1km surface reflectance.

Parameters

<i>ap_paramList[lat]</i>	Search latitude
<i>ap_paramList[lon]</i>	Search longitude
<i>start_date</i>	Starting date
<i>end_date</i>	Ending date
<i>modis_platform</i>	Platform (Either "Terra" or "Aqua")
<i>daynightboth</i>	Use daytime data ('D'), nighttime data ('N') or both ('B')
<i>grid</i>	Further divide each image into a multiple grids of size (y,x)
<i>bands</i>	List of modis bands to retrieve

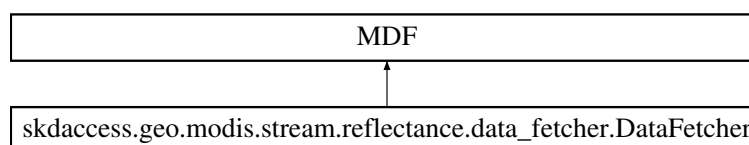
The documentation for this class was generated from the following file:

- geo/modis/cache/reflectance/[data_fetcher.py](#)

6.11 skdaccess.geo.modis.stream.reflectance.DataFetcher Class Reference

Data fetcher for the modis surface reflectance product ('09', 1 km resolution)

Inheritance diagram for skdaccess.geo.modis.stream.reflectance.DataFetcher:



Public Member Functions

- `def __init__ (self, ap_paramList, start_date, end_date, modis_platform='Terra', daynightboth='D', grid=None, bands=[1])`

Construct Data Fetcher for MODIS 1km surface reflectance.

6.11.1 Detailed Description

Data fetcher for the modis surface reflectance product ('09', 1 km resolution)

6.11.2 Constructor & Destructor Documentation

6.11.2.1 __init__()

```
def skdaccess.geo.modis.stream.reflectance.DataFetcher.__init__ (
    self,
    ap_paramList,
    start_date,
    end_date,
    modis_platform = 'Terra',
    daynightboth = 'D',
    grid = None,
    bands = [1 ]
```

Construct Data Fetcher for MODIS 1km surface reflectance.

Parameters

<code>ap_paramList[lat]</code>	Search latitude
<code>ap_paramList[lon]</code>	Search longitude
<code>start_date</code>	Starting date
<code>end_date</code>	Ending date
<code>modis_platform</code>	Platform (Either "Terra" or "Aqua")
<code>daynightboth</code>	Use daytime data ('D'), nighttime data ('N') or both ('B')
<code>grid</code>	Further divide each image into a multiple grids of size (y,x)
<code>bands</code>	List of modis bands to retrieve

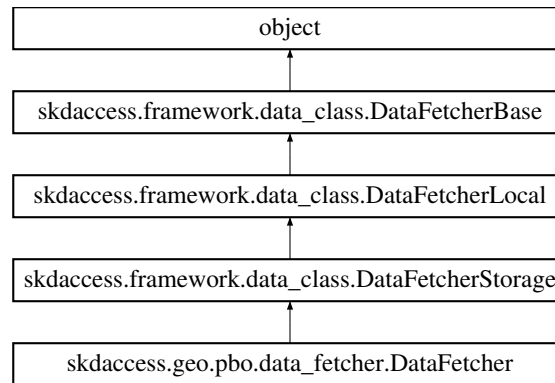
The documentation for this class was generated from the following file:

- `geo/modis/stream/reflectance/data_fetcher.py`

6.12 skdaccess.geo.pbo.DataFetcher Class Reference

Data fetcher for PBO GPS data.

Inheritance diagram for skdaccess.geo.pbo.DataFetcher:



Public Member Functions

- def `__init__` (self, start_time, end_time, [ap_paramList](#), mdyratio=.5, [default_columns](#)=['dN', dE, dU, [default_↵](#)
[error_columns](#)=['Sn', Se, Su, [use_progress_bar](#)=True)
Initialize a [DataFetcher](#).
- def [setStationList](#) (self, [station_list](#))
Set the list of stations to use.
- def [getInfo](#) (self)
Get information about the stations and geo_point.
- def [output](#) (self)
Generate PBO Data Wrapper.
- def `__str__` (self)
print the parameter values
- def [getStationMetadata](#) ()
Read in the metadata and convert to dictionary.
- def [getAntennaLogs](#) ()
Get antenna logs.
- def [downloadFullDataset](#) (cls, out_file='pbo_data.h5', use_file=None)
Download and parse data from the Plate Boundary Observatory.
- def [multirun_enabled](#) (self)
Returns whether or not this data fetcher is multirun enabled.
- def [getDataLocation](#) (data_name)
Get the location of data set.
- def [setDataLocation](#) (data_name, location, key='data_location')
Set the location of a data set.
- def [perturb](#) (self)
Perturb parameters.
- def [reset](#) (self)

- *Set all parameters to initial value.*
- def [getMetadata](#) (self)
Return metadata about Data Fetcher.
- def [getConfig](#) ()
Retrieve skdaccess configuration.
- def [writeConfig](#) (conf)
Write config to disk.

Public Attributes

- [station_list](#)
- [default_columns](#)
- [default_error_columns](#)
- [use_progress_bar](#)
- [antenna_info](#)
- [meta_data](#)
- [ap_paramList](#)

6.12.1 Detailed Description

Data fetcher for PBO GPS data.

6.12.2 Constructor & Destructor Documentation

6.12.2.1 `__init__()`

```
def skdaccess.geo.pbo.DataFetcher.__init__ (
    self,
    start_time,
    end_time,
    ap_paramList,
    mdyratio = .5,
    default_columns = ['dN',
    dE,
    dU,
    default_error_columns = ['Sn',
    Se,
    Su,
    use_progress_bar = True )
```

Initialize a [DataFetcher](#).

Parameters

<i>start_time</i>	String of starting date in the form of "2005-01-01"
<i>end_time</i>	String of ending date in the form of "2014-12-31"
<i>ap_paramList[lat_range]</i>	AutoList, Latitude range used to select stabilization sites
<i>ap_paramList[lon_range]</i>	AutoList, Longitude range used to select stabilization sites
<i>mdyratio</i>	Only keep stations that have mdyratio of data in the specified time range
<i>default_columns</i>	Default columns to process
<i>default_error_columns</i>	Default error columns to process

6.12.3 Member Function Documentation

6.12.3.1 __str__()

```
def skdaccess.geo.pbo.DataFetcher.__str__ (
    self )
```

print the parameter values

Returns

String representation of Data Fetcher

6.12.3.2 downloadFullDataset()

```
def skdaccess.geo.pbo.DataFetcher.downloadFullDataset (
    cls,
    out_file = 'pbo_data.h5',
    use_file = None )
```

Download and parse data from the Plate Boundary Observatory.

Parameters

<i>out_file</i>	Output filename for parsed data
<i>use_file</i>	Use already downloaded data. If None, data will be downloaded.

Returns

Absolute path of parsed data

6.12.3.3 getAntennaLogs()

```
def skdaccess.geo.pbo.DataFetcher.getAntennaLogs ( )
```

Get antenna logs.

Returns

dictionary of data frames containing antenna logs

6.12.3.4 getConfig()

```
def skdaccess.framework.data_class.DataFetcherBase.getConfig ( ) [inherited]
```

Retrieve skdaccess configuration.

Returns

configParser.ConfigParser object of configuration

6.12.3.5 getDataLocation()

```
def skdaccess.framework.data_class.DataFetcherLocal.getDataLocation (
    data_name ) [inherited]
```

Get the location of data set.

Parameters

<i>data_name</i>	Name of data set
------------------	------------------

Returns

string of data location, None if not found

6.12.3.6 getInfo()

```
def skdaccess.geo.pbo.DataFetcher.getInfo (
    self )
```

Get information about the stations and geo_point.

Returns

tuple containing station list and geo_point

6.12.3.7 getMetadata()

```
def skdaccess.framework.data_class.DataFetcherBase.getMetadata (
    self ) [inherited]
```

Return metadata about Data Fetcher.

Returns

metadata of object.

6.12.3.8 getStationMetadata()

```
def skdaccess.geo.pbo.DataFetcher.getStationMetadata ( )
```

Read in the metadata and convert to dictionary.

Returns

dictionary of PBO metadata

6.12.3.9 multirun_enabled()

```
def skdaccess.framework.data_class.DataFetcherStorage.multirun_enabled (
    self ) [inherited]
```

Returns whether or not this data fetcher is multirun enabled.

Returns

Boolean indicating whether or not this data fetcher is multirun enabled

6.12.3.10 output()

```
def skdaccess.geo.pbo.DataFetcher.output (
    self )
```

Generate PBO Data Wrapper.

Returns

PBO Data Wrapper

6.12.3.11 perturb()

```
def skdaccess.framework.data_class.DataFetcherBase.perturb (
    self ) [inherited]
```

Perturb parameters.

6.12.3.12 reset()

```
def skdaccess.framework.data_class.DataFetcherBase.reset (
    self ) [inherited]
```

Set all parameters to initial value.

6.12.3.13 setDataLocation()

```
def skdaccess.framework.data_class.DataFetcherLocal.setDataLocation (
    data_name,
    location,
    key = 'data_location' ) [inherited]
```

Set the location of a data set.

Parameters

<i>data_name</i>	Name of data set
<i>location</i>	Location of data set
<i>key</i>	Key of configuration option

6.12.3.14 setStationList()

```
def skdaccess.geo.pbo.DataFetcher.setStationList (
    self,
    station_list )
```

Set the list of stations to use.

Parameters

<i>station_list</i>	List of stations to fetch
---------------------	---------------------------

6.12.3.15 writeConfig()

```
def skdaccess.framework.data_class.DataFetcherBase.writeConfig (
    conf ) [inherited]
```

Write config to disk.

Parameters

<i>conf</i>	configparser.ConfigParser object
-------------	----------------------------------

6.12.4 Member Data Documentation

6.12.4.1 antenna_info

```
skdaccess.geo.pbo.DataFetcher.antenna_info
```

6.12.4.2 ap_paramList

```
skdaccess.framework.data_class.DataFetcherBase.ap_paramList [inherited]
```

6.12.4.3 default_columns

`skdaccess.geo.pbo.DataFetcher.default_columns`

6.12.4.4 default_error_columns

`skdaccess.geo.pbo.DataFetcher.default_error_columns`

6.12.4.5 meta_data

`skdaccess.geo.pbo.DataFetcher.meta_data`

6.12.4.6 station_list

`skdaccess.geo.pbo.DataFetcher.station_list`

6.12.4.7 use_progress_bar

`skdaccess.geo.pbo.DataFetcher.use_progress_bar`

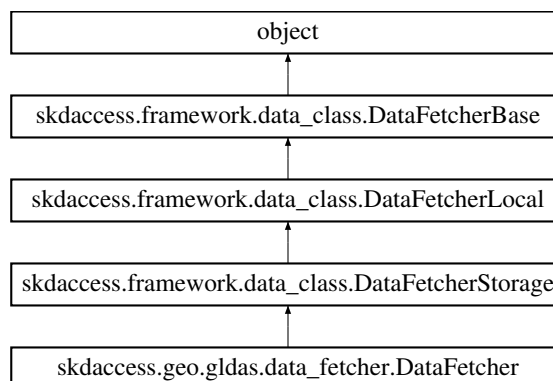
The documentation for this class was generated from the following file:

- [geo/pbo/data_fetcher.py](#)

6.13 skdaccess.geo.gldas.DataFetcher Class Reference

Data Fetcher for GLDAS data.

Inheritance diagram for `skdaccess.geo.gldas.DataFetcher`:



Public Member Functions

- def `__init__` (self, `ap_paramList`, `start_date`=None, `end_date`=None, `resample`=False)
Construct a GLDAS Data Fetcher.
- def `output` (self)
Create data wrapper of GLDAS data for specified geopoint.
- def `downloadFullDataset` (cls, `out_file`=None, `use_file`=None)
Download GLDAS data.
- def `__str__` (self)
String representation of data fetcher.
- def `multirun_enabled` (self)
Returns whether or not this data fetcher is multirun enabled.
- def `getDataLocation` (data_name)
Get the location of data set.
- def `setDataLocation` (data_name, location, key='data_location')
Set the location of a data set.
- def `perturb` (self)
Perturb parameters.
- def `reset` (self)
Set all parameters to initial value.
- def `getMetadata` (self)
Return metadata about Data Fetcher.
- def `getConfig` ()
Retrieve skdaccess configuration.
- def `writeConfig` (conf)
Write config to disk.

Public Attributes

- `start_date`
- `end_date`
- `resample`
- `ap_paramList`

6.13.1 Detailed Description

Data Fetcher for GLDAS data.

6.13.2 Constructor & Destructor Documentation

6.13.2.1 `__init__()`

```
def skdaccess.geo.gldas.DataFetcher.__init__ (
    self,
    ap_paramList,
    start_date = None,
    end_date = None,
    resample = False )
```

Construct a GLDAS Data Fetcher.

Parameters

<i>ap_paramList[geo_point]</i>	Autolist of Geographic location tuples
<i>start_date</i>	Beginning date
<i>end_date</i>	Ending date
<i>resample</i>	Resample the data to daily resolution, leaving NaN's in days without data (Default True)

6.13.3 Member Function Documentation

6.13.3.1 `__str__()`

```
def skdaccess.geo.gldas.DataFetcher.__str__ (
    self )
```

String representation of data fetcher.

Returns

String listing the name and geopoint of data fetcher

6.13.3.2 `downloadFullDataset()`

```
def skdaccess.geo.gldas.DataFetcher.downloadFullDataset (
    cls,
    out_file = None,
    use_file = None )
```

Download GLDAS data.

Parameters

<i>out_file</i>	Output filename for parsed data
<i>use_file</i>	Directory of downloaded data. If None, data will be downloaded.

Returns

Absolute path of parsed data

6.13.3.3 getConfig()

```
def skdaccess.framework.data_class.DataFetcherBase.getConfig ( ) [inherited]
```

Retrieve skdaccess configuration.

Returns

configParser.ConfigParser object of configuration

6.13.3.4 getDataLocation()

```
def skdaccess.framework.data_class.DataFetcherLocal.getDataLocation (
    data_name ) [inherited]
```

Get the location of data set.

Parameters

<i>data_name</i>	Name of data set
------------------	------------------

Returns

string of data location, None if not found

6.13.3.5 getMetadata()

```
def skdaccess.framework.data_class.DataFetcherBase.getMetadata (
    self ) [inherited]
```

Return metadata about Data Fetcher.

Returns

metadata of object.

6.13.3.6 multirun_enabled()

```
def skdaccess.framework.data_class.DataFetcherStorage.multirun_enabled (
    self ) [inherited]
```

Returns whether or not this data fetcher is multirun enabled.

Returns

Boolean indicating whether or not this data fetcher is multirun enabled

6.13.3.7 output()

```
def skdaccess.geo.gldas.DataFetcher.output (
    self )
```

Create data wrapper of GLDAS data for specified geopoint.

Returns

GLDAS Data Wrapper

6.13.3.8 perturb()

```
def skdaccess.framework.data_class.DataFetcherBase.perturb (
    self ) [inherited]
```

Perturb parameters.

6.13.3.9 reset()

```
def skdaccess.framework.data_class.DataFetcherBase.reset (
    self ) [inherited]
```

Set all parameters to initial value.

6.13.3.10 setDataLocation()

```
def skdaccess.framework.data_class.DataFetcherLocal.setDataLocation (
    data_name,
    location,
    key = 'data_location' ) [inherited]
```

Set the location of a data set.

Parameters

<i>data_name</i>	Name of data set
<i>location</i>	Location of data set
<i>key</i>	Key of configuration option

6.13.3.11 writeConfig()

```
def skdaccess.framework.data_class.DataFetcherBase.writeConfig (  
    conf ) [inherited]
```

Write config to disk.

Parameters

<i>conf</i>	configparser.ConfigParser object
-------------	----------------------------------

6.13.4 Member Data Documentation

6.13.4.1 ap_paramList

```
skdaccess.framework.data_class.DataFetcherBase.ap_paramList [inherited]
```

6.13.4.2 end_date

```
skdaccess.geo.gldas.DataFetcher.end_date
```

6.13.4.3 resample

```
skdaccess.geo.gldas.DataFetcher.resample
```

6.13.4.4 start_date

`skdaccess.geo.gldas.DataFetcher.start_date`

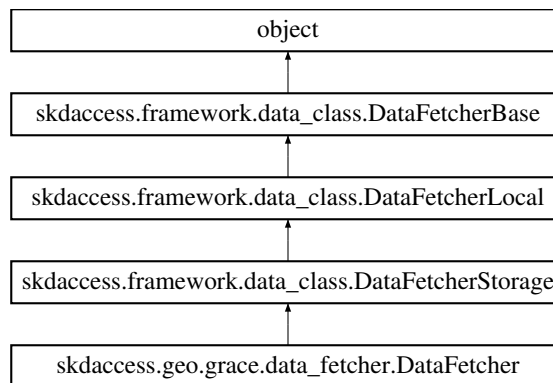
The documentation for this class was generated from the following file:

- [geo/gldas/data_fetcher.py](#)

6.14 skdaccess.geo.grace.DataFetcher Class Reference

Data Fetcher for GRACE data.

Inheritance diagram for `skdaccess.geo.grace.DataFetcher`:



Public Member Functions

- `def __init__(self, ap_paramList, start_date=None, end_date=None)`
Construct a Grace Data Fetcher.
- `def output(self)`
Create data wrapper of grace data for specified geopoints.
- `def __str__(self)`
String representation of data fetcher.
- `def downloadFullDataset(cls, out_file='grace.h5', use_file=None)`
Download and parse data from the Gravity Recovery and Climate Experiment.
- `def multirun_enabled(self)`
Returns whether or not this data fetcher is multirun enabled.
- `def getDataLocation(data_name)`
Get the location of data set.
- `def setDataLocation(data_name, location, key='data_location')`
Set the location of a data set.
- `def perturb(self)`
Perturb parameters.
- `def reset(self)`

- *Set all parameters to initial value.*
- def [getMetadata](#) (self)
Return metadata about Data Fetcher.
- def [getConfig](#) ()
Retrieve skdaccess configuration.
- def [writeConfig](#) (conf)
Write config to disk.

Public Attributes

- [start_date](#)
- [end_date](#)
- [ap_paramList](#)

6.14.1 Detailed Description

Data Fetcher for GRACE data.

6.14.2 Constructor & Destructor Documentation

6.14.2.1 `__init__()`

```
def skdaccess.geo.grace.DataFetcher.__init__ (
    self,
    ap_paramList,
    start_date = None,
    end_date = None )
```

Construct a Grace Data Fetcher.

Parameters

<i>ap_paramList[geo_point]</i>	AutoList of geographic location tuples (lat,lon)
<i>start_date</i>	Beginning date
<i>end_date</i>	Ending date

6.14.3 Member Function Documentation

6.14.3.1 `__str__()`

```
def skdaccess.geo.grace.DataFetcher.__str__ (
    self )
```

String representation of data fetcher.

Returns

String listing the name and geopoint of data fetcher

6.14.3.2 `downloadFullDataset()`

```
def skdaccess.geo.grace.DataFetcher.downloadFullDataset (
    cls,
    out_file = 'grace.h5',
    use_file = None )
```

Download and parse data from the Gravity Recovery and Climate Experiment.

Parameters

<i>out_file</i>	Output filename for parsed data
<i>use_file</i>	Directory of already downloaded data. If None, data will be downloaded.

Returns

Absolute path of parsed data

6.14.3.3 `getConfig()`

```
def skdaccess.framework.data_class.DataFetcherBase.getConfig ( ) [inherited]
```

Retrieve skdaccess configuration.

Returns

configParser.ConfigParser object of configuration

6.14.3.4 `getDataLocation()`

```
def skdaccess.framework.data_class.DataFetcherLocal.getDataLocation (
    data_name ) [inherited]
```

Get the location of data set.

Parameters

<i>data_name</i>	Name of data set
------------------	------------------

Returns

string of data location, None if not found

6.14.3.5 getMetadata()

```
def skdaccess.framework.data_class.DataFetcherBase.getMetadata (
    self ) [inherited]
```

Return metadata about Data Fetcher.

Returns

metadata of object.

6.14.3.6 multirun_enabled()

```
def skdaccess.framework.data_class.DataFetcherStorage.multirun_enabled (
    self ) [inherited]
```

Returns whether or not this data fetcher is multirun enabled.

Returns

Boolean indicating whether or not this data fetcher is multirun enabled

6.14.3.7 output()

```
def skdaccess.geo.grace.DataFetcher.output (
    self )
```

Create data wrapper of grace data for specified geopoints.

Returns

Grace Data Wrapper

6.14.3.8 perturb()

```
def skdaccess.framework.data_class.DataFetcherBase.perturb (
    self ) [inherited]
```

Perturb parameters.

6.14.3.9 reset()

```
def skdaccess.framework.data_class.DataFetcherBase.reset (
    self ) [inherited]
```

Set all parameters to initial value.

6.14.3.10 setDataLocation()

```
def skdaccess.framework.data_class.DataFetcherLocal.setDataLocation (
    data_name,
    location,
    key = 'data_location' ) [inherited]
```

Set the location of a data set.

Parameters

<i>data_name</i>	Name of data set
<i>location</i>	Location of data set
<i>key</i>	Key of configuration option

6.14.3.11 writeConfig()

```
def skdaccess.framework.data_class.DataFetcherBase.writeConfig (
    conf ) [inherited]
```

Write config to disk.

Parameters

<i>conf</i>	configparser.ConfigParser object
-------------	----------------------------------

6.14.4 Member Data Documentation

6.14.4.1 ap_paramList

`skdaccess.framework.data_class.DataFetcherBase.ap_paramList` [inherited]

6.14.4.2 end_date

`skdaccess.geo.grace.DataFetcher.end_date`

6.14.4.3 start_date

`skdaccess.geo.grace.DataFetcher.start_date`

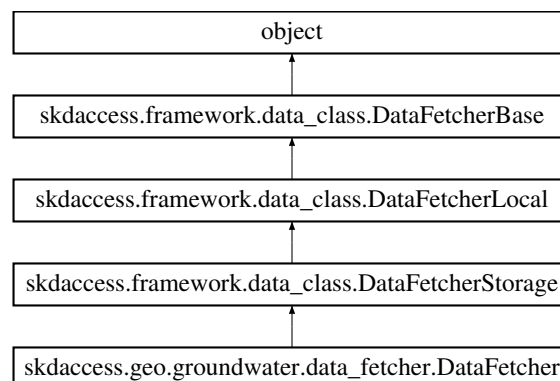
The documentation for this class was generated from the following file:

- [geo/grace/data_fetcher.py](#)

6.15 skdaccess.geo.groundwater.DataFetcher Class Reference

Generates Data Wrappers of groundwater measurements taken in the US.

Inheritance diagram for `skdaccess.geo.groundwater.DataFetcher`:



Public Member Functions

- `def __init__ (self, ap_paramList=[], start_date=None, end_date=None, cutoff=0.75)`
Construct a Groundwater Data Fetcher.
- `def output (self)`
Fetch Groundwater Data Wrapper.
- `def __str__ (self)`
String representation of data fetcher.
- `def getStationMetadata ()`
Retrieve metadata on groundwater wells.
- `def downloadFullDataset (cls, out_file='gw.h5', use_file=None)`
Download and parse US groundwater data provided by USGS.
- `def multirun_enabled (self)`
Returns whether or not this data fetcher is multirun enabled.
- `def getDataLocation (data_name)`
Get the location of data set.
- `def setDataLocation (data_name, location, key='data_location')`
Set the location of a data set.
- `def perturb (self)`
Perturb parameters.
- `def reset (self)`
Set all parameters to initial value.
- `def getMetadata (self)`
Return metadata about Data Fetcher.
- `def getConfig ()`
Retrieve skdaccess configuration.
- `def writeConfig (conf)`
Write config to disk.

Public Attributes

- `start_date`
- `end_date`
- `ap_paramList`
- `cutoff`

6.15.1 Detailed Description

Generates Data Wrappers of groundwater measurements taken in the US.

6.15.2 Constructor & Destructor Documentation

6.15.2.1 `__init__()`

```
def skdaccess.geo.groundwater.DataFetcher.__init__ (
    self,
    ap_paramList = [],
    start_date = None,
    end_date = None,
    cutoff = 0.75 )
```

Construct a Groundwater Data Fetcher.

Parameters

<code>ap_paramList[LowerLat]</code>	Autoparam Lower latitude
<code>ap_paramList[UpperLat]</code>	Autoparam Upper latitude
<code>ap_paramList[LeftLon]</code>	Autoparam Left longitude
<code>ap_paramList[RightLon]</code>	Autoparam Right longitude
<code>start_date</code>	Starting date (default: None)
<code>end_date</code>	Ending date (default: None)
<code>cutoff</code>	Required amount of data for each station

6.15.3 Member Function Documentation

6.15.3.1 `__str__()`

```
def skdaccess.geo.groundwater.DataFetcher.__str__ (
    self )
```

String representation of data fetcher.

Returns

string describing data fetcher

6.15.3.2 `downloadFullDataset()`

```
def skdaccess.geo.groundwater.DataFetcher.downloadFullDataset (
    cls,
    out_file = 'gw.h5',
    use_file = None )
```

Download and parse US groundwater data provided by USGS.

Parameters

<i>out_file</i>	Output filename for parsed data
<i>use_file</i>	Specify the directory where the data is. If None, the function will download the data

Returns

Absolute path of parsed data

6.15.3.3 getConfig()

```
def skdaccess.framework.data_class.DataFetcherBase.getConfig ( ) [inherited]
```

Retrieve skdaccess configuration.

Returns

configParser.ConfigParser object of configuration

6.15.3.4 getDataLocation()

```
def skdaccess.framework.data_class.DataFetcherLocal.getDataLocation (
    data_name ) [inherited]
```

Get the location of data set.

Parameters

<i>data_name</i>	Name of data set
------------------	------------------

Returns

string of data location, None if not found

6.15.3.5 getMetadata()

```
def skdaccess.framework.data_class.DataFetcherBase.getMetadata (
    self ) [inherited]
```

Return metadata about Data Fetcher.

Returns

metadata of object.

6.15.3.6 getStationMetadata()

```
def skdaccess.geo.groundwater.DataFetcher.getStationMetadata ( )
```

Retrieve metadata on groundwater wells.

Returns

pandas dataframe with groundwater well information

6.15.3.7 multirun_enabled()

```
def skdaccess.framework.data_class.DataFetcherStorage.multirun_enabled (
    self ) [inherited]
```

Returns whether or not this data fetcher is multirun enabled.

Returns

Boolean indicating whether or not this data fetcher is multirun enabled

6.15.3.8 output()

```
def skdaccess.geo.groundwater.DataFetcher.output (
    self )
```

Fetch Groundwater Data Wrapper.

Returns

Groundwater Data Wrapper

6.15.3.9 perturb()

```
def skdaccess.framework.data_class.DataFetcherBase.perturb (
    self ) [inherited]
```

Perturb parameters.

6.15.3.10 reset()

```
def skdaccess.framework.data_class.DataFetcherBase.reset (
    self ) [inherited]
```

Set all parameters to initial value.

6.15.3.11 setDataLocation()

```
def skdaccess.framework.data_class.DataFetcherLocal.setDataLocation (
    data_name,
    location,
    key = 'data_location' ) [inherited]
```

Set the location of a data set.

Parameters

<i>data_name</i>	Name of data set
<i>location</i>	Location of data set
<i>key</i>	Key of configuration option

6.15.3.12 writeConfig()

```
def skdaccess.framework.data_class.DataFetcherBase.writeConfig (
    conf ) [inherited]
```

Write config to disk.

Parameters

<i>conf</i>	configparser.ConfigParser object
-------------	----------------------------------

6.15.4 Member Data Documentation

6.15.4.1 ap_paramList

`skdaccess.geo.groundwater.DataFetcher.ap_paramList`

6.15.4.2 cutoff

`skdaccess.geo.groundwater.DataFetcher.cutoff`

6.15.4.3 end_date

`skdaccess.geo.groundwater.DataFetcher.end_date`

6.15.4.4 start_date

`skdaccess.geo.groundwater.DataFetcher.start_date`

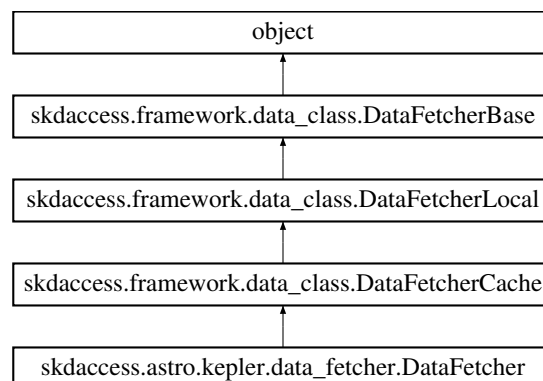
The documentation for this class was generated from the following file:

- [geo/groundwater/data_fetcher.py](#)

6.16 skdaccess.astro.kepler.DataFetcher Class Reference

Data Fetcher for Kepler light curve data.

Inheritance diagram for `skdaccess.astro.kepler.DataFetcher`:



Public Member Functions

- def [__init__](#) (self, [ap_paramList](#), [quarter_list](#)=None)
Initialize Kepler Data Fetcher.
- def [downloadKeplerData](#) (self, [kid_list](#))
Download and parse Kepler data for a list of kepler id's.
- def [cacheData](#) (self, [data_specification](#))
Cache Kepler data locally.
- def [output](#) (self)
Output kepler data wrapper.
- def [cacheData](#) (self, [keyname](#), [online_path_list](#))
Download and store specified data to local disk.
- def [multirun_enabled](#) (self)
Returns whether or not this data fetcher is multirun enabled.
- def [getDataLocation](#) ([data_name](#))
Get the location of data set.
- def [setDataLocation](#) ([data_name](#), [location](#), [key](#)='data_location')
Set the location of a data set.
- def [perturb](#) (self)
Perturb parameters.
- def [reset](#) (self)
Set all parameters to initial value.
- def [__str__](#) (self)
Generate string description.
- def [getMetadata](#) (self)
Return metadata about Data Fetcher.
- def [getConfig](#) ()
Retrieve skdaccess configuration.
- def [writeConfig](#) ([conf](#))
Write config to disk.

Public Attributes

- [quarter_list](#)
- [ap_paramList](#)

6.16.1 Detailed Description

Data Fetcher for Kepler light curve data.

6.16.2 Constructor & Destructor Documentation

6.16.2.1 `__init__()`

```
def skdaccess.astro.kepler.DataFetcher.__init__ (
    self,
    ap_paramList,
    quarter_list = None )
```

Initialize Kepler Data Fetcher.

Parameters

<i>ap_paramList[kepler_id_list]</i>	List of kepler id's
<i>quarter_list</i>	List of quarters (0-17) (default: all quarters)

6.16.3 Member Function Documentation

6.16.3.1 `__str__()`

```
def skdaccess.framework.data_class.DataFetcherBase.__str__ (
    self ) [inherited]
```

Generate string description.

6.16.3.2 `cacheData()` [1/2]

```
def skdaccess.astro.kepler.DataFetcher.cacheData (
    self,
    data_specification )
```

Cache Kepler data locally.

Parameters

<i>data_specification</i>	List of kepler IDs
---------------------------	--------------------

6.16.3.3 `cacheData()` [2/2]

```
def skdaccess.framework.data_class.DataFetcherCache.cacheData (
```

```
self,  
keyname,  
online_path_list ) [inherited]
```

Download and store specified data to local disk.

Parameters

<i>data_specification</i>	Specification of data to be retrieved
---------------------------	---------------------------------------

Returns

List of downloaded file locations

6.16.3.4 downloadKeplerData()

```
def skdaccess.astro.kepler.DataFetcher.downloadKeplerData (  
    self,  
    kid_list )
```

Download and parse Kepler data for a list of kepler id's.

Parameters

<i>kid_list</i>	List of Kepler ID's to download
-----------------	---------------------------------

Returns

dictionary of kepler data

6.16.3.5 getConfig()

```
def skdaccess.framework.data_class.DataFetcherBase.getConfig ( ) [inherited]
```

Retrieve skdaccess configuration.

Returns

configParser.ConfigParser object of configuration

6.16.3.6 getDataLocation()

```
def skdaccess.framework.data_class.DataFetcherLocal.getDataLocation (
    data_name ) [inherited]
```

Get the location of data set.

Parameters

<i>data_name</i>	Name of data set
------------------	------------------

Returns

string of data location, None if not found

6.16.3.7 getMetadata()

```
def skdaccess.framework.data_class.DataFetcherBase.getMetadata (
    self ) [inherited]
```

Return metadata about Data Fetcher.

Returns

metadata of object.

6.16.3.8 multirun_enabled()

```
def skdaccess.framework.data_class.DataFetcherCache.multirun_enabled (
    self ) [inherited]
```

Returns whether or not this data fetcher is multirun enabled.

Returns

Boolean indicating whether or not this data fetcher is multirun enabled

6.16.3.9 output()

```
def skdaccess.astro.kepler.DataFetcher.output (
    self )
```

Output kepler data wrapper.

Returns

DataWrapper

6.16.3.10 perturb()

```
def skdaccess.framework.data_class.DataFetcherBase.perturb (
    self ) [inherited]
```

Perturb parameters.

6.16.3.11 reset()

```
def skdaccess.framework.data_class.DataFetcherBase.reset (
    self ) [inherited]
```

Set all parameters to initial value.

6.16.3.12 setDataLocation()

```
def skdaccess.framework.data_class.DataFetcherLocal.setDataLocation (
    data_name,
    location,
    key = 'data_location' ) [inherited]
```

Set the location of a data set.

Parameters

<i>data_name</i>	Name of data set
<i>location</i>	Location of data set
<i>key</i>	Key of configuration option

6.16.3.13 writeConfig()

```
def skdaccess.framework.data_class.DataFetcherBase.writeConfig (
    conf ) [inherited]
```

Write config to disk.

Parameters

<i>conf</i>	configparser.ConfigParser object
-------------	----------------------------------

6.16.4 Member Data Documentation

6.16.4.1 ap_paramList

```
skdaccess.framework.data_class.DataFetcherBase.ap_paramList [inherited]
```

6.16.4.2 quarter_list

```
skdaccess.astro.kepler.DataFetcher.quarter_list
```

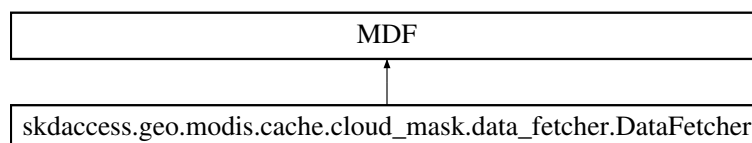
The documentation for this class was generated from the following file:

- astro/kepler/[data_fetcher.py](#)

6.17 skdaccess.geo.modis.cache.cloud_mask.DataFetcher Class Reference

Data Fetcher for MODIS Cloud Mask.

Inheritance diagram for skdaccess.geo.modis.cache.cloud_mask.DataFetcher:



Public Member Functions

- def `__init__` (self, ap_paramList, start_date, end_date, modis_platform='Terra', daynightboth='D', grid=None)
Construct Data Fetcher for MODIS cloud mask data.

6.17.1 Detailed Description

Data Fetcher for MODIS Cloud Mask.

6.17.2 Constructor & Destructor Documentation

6.17.2.1 `__init__()`

```
def skdaccess.geo.modis.cache.cloud_mask.DataFetcher.__init__ (
    self,
    ap_paramList,
    start_date,
    end_date,
    modis_platform = 'Terra',
    daynightboth = 'D',
    grid = None )
```

Construct Data Fetcher for MODIS cloud mask data.

Parameters

<i>ap_paramList[lat]</i>	Search latitude
<i>ap_paramList[lon]</i>	Search longitude
<i>start_date</i>	Starting date
<i>end_date</i>	Ending date
<i>modis_platform</i>	Platform (Either "Terra" or "Aqua")
<i>daynightboth</i>	Use daytime data ('D'), nighttime data ('N') or both ('B')
<i>grid</i>	Further divide each image into a multiple grids of size (y,x)

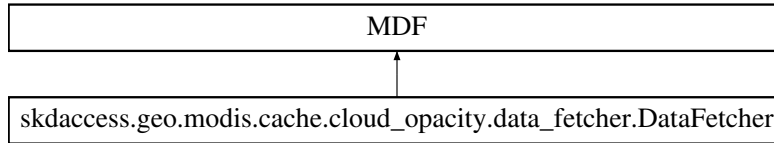
The documentation for this class was generated from the following file:

- [geo/modis/cache/cloud_mask/data_fetcher.py](#)

6.18 skdaccess.geo.modis.cache.cloud_opacity.DataFetcher Class Reference

Data Fetcher for MODIS Cloud Opacity.

Inheritance diagram for skdaccess.geo.modis.cache.cloud_opacity.DataFetcher:



Public Member Functions

- def `__init__` (self, ap_paramList, start_date, end_date, modis_platform='Terra', daynightboth='D', grid=None)
Construct Data Fetcher object for MODIS cloud Opacity data.

6.18.1 Detailed Description

Data Fetcher for MODIS Cloud Opacity.

6.18.2 Constructor & Destructor Documentation

6.18.2.1 `__init__()`

```

def skdaccess.geo.modis.cache.cloud_opacity.DataFetcher.__init__ (
    self,
    ap_paramList,
    start_date,
    end_date,
    modis_platform = 'Terra',
    daynightboth = 'D',
    grid = None )

```

Construct Data Fetcher object for MODIS cloud Opacity data.

Parameters

<code>ap_paramList[lat]</code>	Search latitude
<code>ap_paramList[lon]</code>	Search longitude
<code>start_date</code>	Starting date
<code>end_date</code>	Ending date
<code>modis_platform</code>	Platform (Either "Terra" or "Aqua")
<code>daynightboth</code>	Use daytime data ('D'), nighttime data ('N') or both ('B')
<code>grid</code>	Further divide each image into a multiple grids of size (y,x)

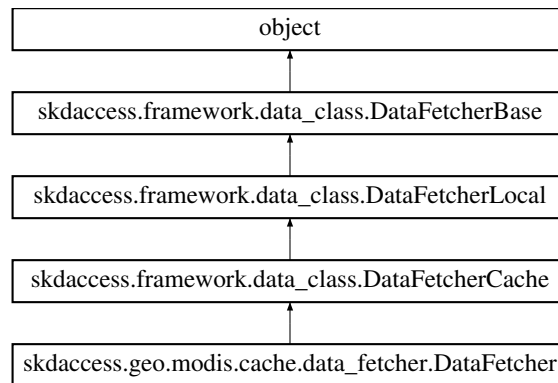
The documentation for this class was generated from the following file:

- [geo/modis/cache/cloud_opacity/data_fetcher.py](#)

6.19 skdaccess.geo.modis.cache.DataFetcher Class Reference

Data Fetcher for MODIS data.

Inheritance diagram for skdaccess.geo.modis.cache.DataFetcher:



Public Member Functions

- `def __init__(self, ap_paramList, modis_platform, modis_id, variable_list, start_date, end_date, daynightboth='D', grid=None, grid_fill=np.nan, use_long_name=False)`
Construct Data Fetcher object.
- `def find_data(self, fileid_list)`
Finds files previously downloaded files associated with fileids.
- `def cacheData(self, data_specification)`
Download MODIS data.
- `def output(self)`
Generate data wrapper.
- `def cacheData(self, keyname, online_path_list)`
Download and store specified data to local disk.
- `def multirun_enabled(self)`
Returns whether or not this data fetcher is multirun enabled.
- `def getDataLocation(data_name)`
Get the location of data set.
- `def setDataLocation(data_name, location, key='data_location')`
Set the location of a data set.
- `def perturb(self)`
Perturb parameters.
- `def reset(self)`
Set all parameters to initial value.

- def `__str__` (self)
Generate string description.
- def `getMetadata` (self)
Return metadata about Data Fetcher.
- def `getConfig` ()
Retrieve skdaccess configuration.
- def `writeConfig` (conf)
Write config to disk.

Public Attributes

- `modis_id`
- `variable_list`
- `start_date`
- `end_date`
- `daynightboth`
- `grid`
- `grid_fill`
- `use_long_name`
- `modis_platform`
- `modis_identifier`
- `ap_paramList`

6.19.1 Detailed Description

Data Fetcher for MODIS data.

6.19.2 Constructor & Destructor Documentation

6.19.2.1 `__init__`()

```
def skdaccess.geo.modis.cache.DataFetcher.__init__ (
    self,
    ap_paramList,
    modis_platform,
    modis_id,
    variable_list,
    start_date,
    end_date,
    daynightboth = 'D',
    grid = None,
    grid_fill = np.nan,
    use_long_name = False )
```

Construct Data Fetcher object.

Parameters

<i>ap_paramList[lat]</i>	Search latitude
<i>ap_paramList[lon]</i>	Search longitude
<i>modis_platform</i>	Platform (Either "Terra" or "Aqua")
<i>modis_id</i>	Product string (e.g. '06_L2')
<i>variable_list</i>	List of variables to fetch
<i>start_date</i>	Starting date
<i>end_date</i>	Ending date
<i>daynightboth</i>	Use daytime data ('D'), nighttime data ('N') or both ('B')
<i>grid</i>	Further divide each image into a multiple grids of size (y,x)
<i>grid_fill</i>	Fill value to use when creating gridded data
<i>use_long_name</i>	Use long names for metadata instead of variable name

6.19.3 Member Function Documentation

6.19.3.1 `__str__()`

```
def skdaccess.framework.data_class.DataFetcherBase.__str__ (
    self ) [inherited]
```

Generate string description.

6.19.3.2 `cacheData()` [1/2]

```
def skdaccess.geo.modis.cache.DataFetcher.cacheData (
    self,
    data_specification )
```

Download MODIS data.

Parameters

<i>data_specification</i>	List of file IDs to cache
---------------------------	---------------------------

6.19.3.3 cacheData() [2/2]

```
def skdaccess.framework.data_class.DataFetcherCache.cacheData (
    self,
    keyname,
    online_path_list ) [inherited]
```

Download and store specified data to local disk.

Parameters

<i>data_specification</i>	Specification of data to be retrieved
---------------------------	---------------------------------------

Returns

List of downloaded file locations

6.19.3.4 find_data()

```
def skdaccess.geo.modis.cache.DataFetcher.find_data (
    self,
    fileid_list )
```

Finds files previously downloaded files associated with fileids.

Parameters

<i>fileid_list</i>	List of file id's
--------------------	-------------------

Returns

Pandas series of file locaitons indexed by file id

6.19.3.5 getConfig()

```
def skdaccess.framework.data_class.DataFetcherBase.getConfig ( ) [inherited]
```

Retrieve skdaccess configuration.

Returns

configParser.ConfigParser object of configuration

6.19.3.6 `getDataLocation()`

```
def skdaccess.framework.data_class.DataFetcherLocal.getDataLocation (
    data_name ) [inherited]
```

Get the location of data set.

Parameters

<i>data_name</i>	Name of data set
------------------	------------------

Returns

string of data location, None if not found

6.19.3.7 `getMetadata()`

```
def skdaccess.framework.data_class.DataFetcherBase.getMetadata (
    self ) [inherited]
```

Return metadata about Data Fetcher.

Returns

metadata of object.

6.19.3.8 `multirun_enabled()`

```
def skdaccess.framework.data_class.DataFetcherCache.multirun_enabled (
    self ) [inherited]
```

Returns whether or not this data fetcher is multirun enabled.

Returns

Boolean indicating whether or not this data fetcher is multirun enabled

6.19.3.9 output()

```
def skdaccess.geo.modis.cache.DataFetcher.output (
    self )
```

Generate data wrapper.

Returns

data wrapper of MODIS data

6.19.3.10 perturb()

```
def skdaccess.framework.data_class.DataFetcherBase.perturb (
    self ) [inherited]
```

Perturb parameters.

6.19.3.11 reset()

```
def skdaccess.framework.data_class.DataFetcherBase.reset (
    self ) [inherited]
```

Set all parameters to initial value.

6.19.3.12 setDataLocation()

```
def skdaccess.framework.data_class.DataFetcherLocal.setDataLocation (
    data_name,
    location,
    key = 'data_location' ) [inherited]
```

Set the location of a data set.

Parameters

<i>data_name</i>	Name of data set
<i>location</i>	Location of data set
<i>key</i>	Key of configuration option

6.19.3.13 writeConfig()

```
def skdaccess.framework.data_class.DataFetcherBase.writeConfig (  
    conf ) [inherited]
```

Write config to disk.

Parameters

<i>conf</i>	configparser.ConfigParser object
-------------	----------------------------------

6.19.4 Member Data Documentation

6.19.4.1 ap_paramList

```
skdaccess.framework.data_class.DataFetcherBase.ap_paramList [inherited]
```

6.19.4.2 daynightboth

```
skdaccess.geo.modis.cache.DataFetcher.daynightboth
```

6.19.4.3 end_date

```
skdaccess.geo.modis.cache.DataFetcher.end_date
```

6.19.4.4 grid

```
skdaccess.geo.modis.cache.DataFetcher.grid
```

6.19.4.5 grid_fill

`skdaccess.geo.modis.cache.DataFetcher.grid_fill`

6.19.4.6 modis_id

`skdaccess.geo.modis.cache.DataFetcher.modis_id`

6.19.4.7 modis_identifier

`skdaccess.geo.modis.cache.DataFetcher.modis_identifier`

6.19.4.8 modis_platform

`skdaccess.geo.modis.cache.DataFetcher.modis_platform`

6.19.4.9 start_date

`skdaccess.geo.modis.cache.DataFetcher.start_date`

6.19.4.10 use_long_name

`skdaccess.geo.modis.cache.DataFetcher.use_long_name`

6.19.4.11 variable_list

`skdaccess.geo.modis.cache.DataFetcher.variable_list`

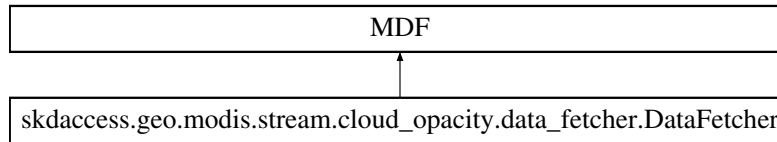
The documentation for this class was generated from the following file:

- `geo/modis/cache/data_fetcher.py`

6.20 skdaccess.geo.modis.stream.cloud_opacity.DataFetcher Class Reference

Data Fetcher for MODIS Cloud Opacity.

Inheritance diagram for skdaccess.geo.modis.stream.cloud_opacity.DataFetcher:



Public Member Functions

- `def __init__(self, ap_paramList, start_date, end_date, modis_platform='Terra', daynightboth='D', grid=None)`
Construct Data Fetcher object for MODIS cloud Opacity data.

6.20.1 Detailed Description

Data Fetcher for MODIS Cloud Opacity.

6.20.2 Constructor & Destructor Documentation

6.20.2.1 __init__()

```

def skdaccess.geo.modis.stream.cloud_opacity.DataFetcher.__init__(
    self,
    ap_paramList,
    start_date,
    end_date,
    modis_platform = 'Terra',
    daynightboth = 'D',
    grid = None )
  
```

Construct Data Fetcher object for MODIS cloud Opacity data.

Parameters

<i>ap_paramList[lat]</i>	Search latitude
<i>ap_paramList[lon]</i>	Search longitude
<i>start_date</i>	Starting date
<i>end_date</i>	Ending date
<i>modis_platform</i>	Platform (Either "Terra" or "Aqua")
<i>daynightboth</i>	Use daytime data ('D'), nighttime data ('N') or both ('B')
<i>grid</i>	Further divide each image into a multiple grids of size (y,x)

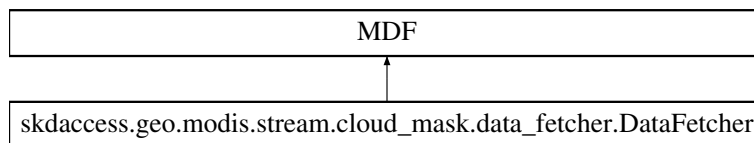
The documentation for this class was generated from the following file:

- [geo/modis/stream/cloud_opacity/data_fetcher.py](#)

6.21 skdaccess.geo.modis.stream.cloud_mask.DataFetcher Class Reference

Data Fetcher for MODIS Cloud Mask.

Inheritance diagram for skdaccess.geo.modis.stream.cloud_mask.DataFetcher:



Public Member Functions

- `def __init__(self, ap_paramList, start_date, end_date, modis_platform='Terra', daynightboth='D', grid=None)`
Construct Data Fetcher for MODIS cloud mask data.

6.21.1 Detailed Description

Data Fetcher for MODIS Cloud Mask.

6.21.2 Constructor & Destructor Documentation

6.21.2.1 __init__()

```

def skdaccess.geo.modis.stream.cloud_mask.DataFetcher.__init__(
    self,
    ap_paramList,
    start_date,
    end_date,
    modis_platform = 'Terra',
    daynightboth = 'D',
    grid = None )
  
```

Construct Data Fetcher for MODIS cloud mask data.

Parameters

<i>ap_paramList[lat]</i>	Search latitude
<i>ap_paramList[lon]</i>	Search longitude
<i>start_date</i>	Starting date
<i>end_date</i>	Ending date
<i>modis_platform</i>	Platform (Either "Terra" or "Aqua")
<i>daynightboth</i>	Use daytime data ('D'), nighttime data ('N') or both ('B')
<i>grid</i>	Further divide each image into a multiple grids of size (y,x)

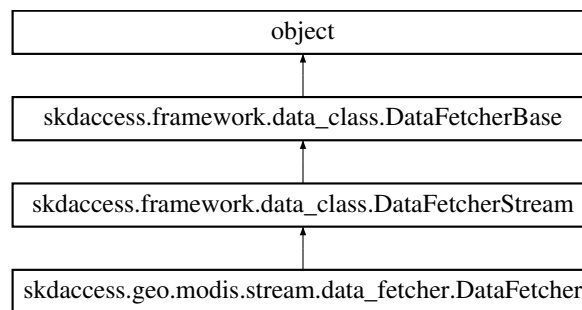
The documentation for this class was generated from the following file:

- [geo/modis/stream/cloud_mask/data_fetcher.py](#)

6.22 skdaccess.geo.modis.stream.DataFetcher Class Reference

Data Fetcher for MODIS data.

Inheritance diagram for skdaccess.geo.modis.stream.DataFetcher:



Public Member Functions

- `def __init__(self, ap_paramList, modis_platform, modis_id, variable_list, start_date, end_date, daynightboth='D', grid=None, grid_fill=np.nan, use_long_name=False)`
Construct Data Fetcher object.
- `def output(self)`
Generate data wrapper.
- `def retrieveOnlineData(self, data_specification)`
Method for downloading data into memory.
- `def multirun_enabled(self)`
Returns whether or not this data fetcher is multirun enabled.
- `def perturb(self)`
Perturb parameters.
- `def reset(self)`

- *Set all parameters to initial value.*
- `def __str__ (self)`
Generate string description.
- `def getMetadata (self)`
Return metadata about Data Fetcher.
- `def getConfig ()`
Retrieve skdaccess configuration.
- `def writeConfig (conf)`
Write config to disk.

Public Attributes

- `modis_id`
- `variable_list`
- `start_date`
- `end_date`
- `daynightboth`
- `grid`
- `grid_fill`
- `use_long_name`
- `modis_platform`
- `modis_identifier`
- `ap_paramList`

6.22.1 Detailed Description

Data Fetcher for MODIS data.

6.22.2 Constructor & Destructor Documentation

6.22.2.1 __init__()

```
def skdaccess.geo.modis.stream.DataFetcher.__init__ (
    self,
    ap_paramList,
    modis_platform,
    modis_id,
    variable_list,
    start_date,
    end_date,
    daynightboth = 'D',
    grid = None,
    grid_fill = np.nan,
    use_long_name = False )
```

Construct Data Fetcher object.

Parameters

<i>ap_paramList[lat]</i>	Search latitude
<i>ap_paramList[lon]</i>	Search longitude
<i>modis_platform</i>	Platform (Either "Terra" or "Aqua")
<i>modis_id</i>	Product string (e.g. '06_L2')
<i>variable_list</i>	List of variables to fetch
<i>start_date</i>	Starting date
<i>end_date</i>	Ending date
<i>daynightboth</i>	Use daytime data ('D'), nighttime data ('N') or both ('B')
<i>grid</i>	Further divide each image into a multiple grids of size (y,x)
<i>grid_fill</i>	Fill value to use when creating gridded data
<i>use_long_name</i>	Use long names for metadata instead of variable name

6.22.3 Member Function Documentation**6.22.3.1 __str__()**

```
def skdaccess.framework.data_class.DataFetcherBase.__str__ (
    self ) [inherited]
```

Generate string description.

6.22.3.2 getConfig()

```
def skdaccess.framework.data_class.DataFetcherBase.getConfig ( ) [inherited]
```

Retrieve skdaccess configuration.

Returns

configParser.ConfigParser object of configuration

6.22.3.3 getMetadata()

```
def skdaccess.framework.data_class.DataFetcherBase.getMetadata (
    self ) [inherited]
```

Return metadata about Data Fetcher.

Returns

metadata of object.

6.22.3.4 multirun_enabled()

```
def skdaccess.framework.data_class.DataFetcherStream.multirun_enabled (
    self ) [inherited]
```

Returns whether or not this data fetcher is multirun enabled.

Returns

Boolean indicating whether or not this data fetcher is multirun enabled

6.22.3.5 output()

```
def skdaccess.geo.modis.stream.DataFetcher.output (
    self )
```

Generate data wrapper.

Returns

data wrapper of MODIS data

6.22.3.6 perturb()

```
def skdaccess.framework.data_class.DataFetcherBase.perturb (
    self ) [inherited]
```

Perturb parameters.

6.22.3.7 reset()

```
def skdaccess.framework.data_class.DataFetcherBase.reset (
    self ) [inherited]
```

Set all parameters to initial value.

6.22.3.8 retrieveOnlineData()

```
def skdaccess.framework.data_class.DataFetcherStream.retrieveOnlineData (
    self,
    data_specification ) [inherited]
```

Method for downloading data into memory.

Parameters

<i>data_specification</i>	Url list of data to be retrieved
---------------------------	----------------------------------

Returns

Retrieved data

6.22.3.9 writeConfig()

```
def skdaccess.framework.data_class.DataFetcherBase.writeConfig (
    conf ) [inherited]
```

Write config to disk.

Parameters

<i>conf</i>	configparser.ConfigParser object
-------------	----------------------------------

6.22.4 Member Data Documentation

6.22.4.1 ap_paramList

skdaccess.framework.data_class.DataFetcherBase.ap_paramList [inherited]

6.22.4.2 daynightboth

skdaccess.geo.modis.stream.DataFetcher.daynightboth

6.22.4.3 end_date

skdaccess.geo.modis.stream.DataFetcher.end_date

6.22.4.4 grid

skdaccess.geo.modis.stream.DataFetcher.grid

6.22.4.5 grid_fill

skdaccess.geo.modis.stream.DataFetcher.grid_fill

6.22.4.6 modis_id

skdaccess.geo.modis.stream.DataFetcher.modis_id

6.22.4.7 modis_identifier

skdaccess.geo.modis.stream.DataFetcher.modis_identifier

6.22.4.8 modis_platform

`skdaccess.geo.modis.stream.DataFetcher.modis_platform`

6.22.4.9 start_date

`skdaccess.geo.modis.stream.DataFetcher.start_date`

6.22.4.10 use_long_name

`skdaccess.geo.modis.stream.DataFetcher.use_long_name`

6.22.4.11 variable_list

`skdaccess.geo.modis.stream.DataFetcher.variable_list`

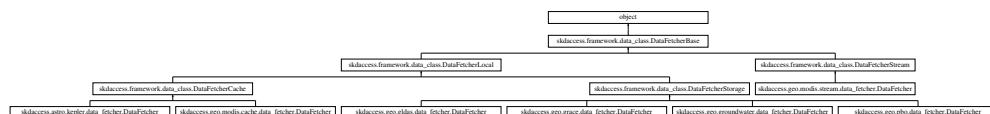
The documentation for this class was generated from the following file:

- [geo/modis/stream/data_fetcher.py](#)

6.23 skdaccess.framework.data_class.DataFetcherBase Class Reference

Base class for all data fetchers.

Inheritance diagram for `skdaccess.framework.data_class.DataFetcherBase`:



Public Member Functions

- def `__init__` (self, `ap_paramList`=[])
Initialize data fetcher with parameter list.
- def `output` (self)
Output data wrapper.
- def `perturb` (self)
Perturb parameters.
- def `reset` (self)
Set all parameters to initial value.
- def `__str__` (self)
Generate string description.
- def `getMetadata` (self)
Return metadata about Data Fetcher.
- def `getConfig` ()
Retrieve skdaccess configuration.
- def `writeConfig` (conf)
Write config to disk.
- def `multirun_enabled` (self)
Returns whether or not this data fetcher is multirun enabled.

Public Attributes

- `ap_paramList`

6.23.1 Detailed Description

Base class for all data fetchers.

6.23.2 Constructor & Destructor Documentation

6.23.2.1 `__init__`()

```
def skdaccess.framework.data_class.DataFetcherBase.__init__ (
    self,
    ap_paramList = [] )
```

Initialize data fetcher with parameter list.

Parameters

<code>ap_paramList</code>	List of parameters
---------------------------	--------------------

6.23.3 Member Function Documentation

6.23.3.1 `__str__()`

```
def skdaccess.framework.data_class.DataFetcherBase.__str__ (
    self )
```

Generate string description.

6.23.3.2 `getConfig()`

```
def skdaccess.framework.data_class.DataFetcherBase.getConfig ( )
```

Retrieve skdaccess configuration.

Returns

configParser.ConfigParser object of configuration

6.23.3.3 `getMetadata()`

```
def skdaccess.framework.data_class.DataFetcherBase.getMetadata (
    self )
```

Return metadata about Data Fetcher.

Returns

metadata of object.

6.23.3.4 `multirun_enabled()`

```
def skdaccess.framework.data_class.DataFetcherBase.multirun_enabled (
    self )
```

Returns whether or not this data fetcher is multirun enabled.

Returns

Boolean indicating whether or not this data fetcher is multirun enabled

6.23.3.5 output()

```
def skdaccess.framework.data_class.DataFetcherBase.output (
    self )
```

Output data wrapper.

Returns

Datawrapper

6.23.3.6 perturb()

```
def skdaccess.framework.data_class.DataFetcherBase.perturb (
    self )
```

Perturb parameters.

6.23.3.7 reset()

```
def skdaccess.framework.data_class.DataFetcherBase.reset (
    self )
```

Set all parameters to initial value.

6.23.3.8 writeConfig()

```
def skdaccess.framework.data_class.DataFetcherBase.writeConfig (
    conf )
```

Write config to disk.

Parameters

<i>conf</i>	configparser.ConfigParser object
-------------	----------------------------------

6.23.4 Member Data Documentation

6.23.4.1 ap_paramList

`skdaccess.framework.data_class.DataFetcherBase.ap_paramList`

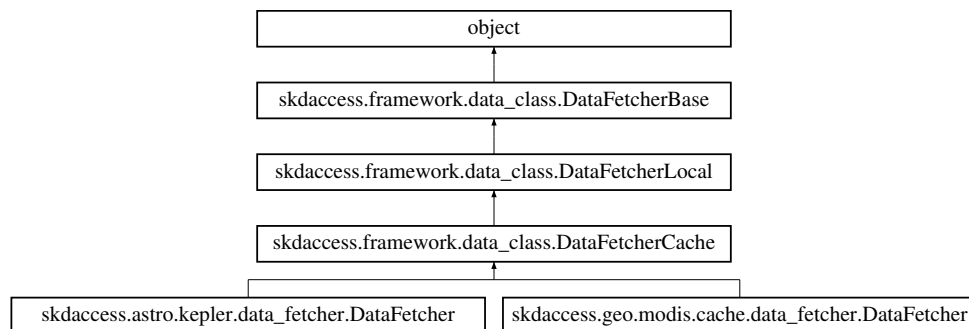
The documentation for this class was generated from the following file:

- [framework/data_class.py](#)

6.24 skdaccess.framework.data_class.DataFetcherCache Class Reference

Data fetcher base class for downloading data and caching results on hard disk.

Inheritance diagram for `skdaccess.framework.data_class.DataFetcherCache`:



Public Member Functions

- `def cacheData (self, keyname, online_path_list)`
Download and store specified data to local disk.
- `def multirun_enabled (self)`
Returns whether or not this data fetcher is multirun enabled.
- `def getDataLocation (data_name)`
Get the location of data set.
- `def setDataLocation (data_name, location, key='data_location')`
Set the location of a data set.
- `def output (self)`
Output data wrapper.
- `def perturb (self)`
Perturb parameters.
- `def reset (self)`

- *Set all parameters to initial value.*
- `def __str__ (self)`
Generate string description.
- `def getMetadata (self)`
Return metadata about Data Fetcher.
- `def getConfig ()`
Retrieve skdaccess configuration.
- `def writeConfig (conf)`
Write config to disk.

Public Attributes

- `ap_paramList`

6.24.1 Detailed Description

Data fetcher base class for downloading data and caching results on hard disk.

6.24.2 Member Function Documentation

6.24.2.1 __str__()

```
def skdaccess.framework.data_class.DataFetcherBase.__str__ (
    self ) [inherited]
```

Generate string description.

6.24.2.2 cacheData()

```
def skdaccess.framework.data_class.DataFetcherCache.cacheData (
    self,
    keyname,
    online_path_list )
```

Download and store specified data to local disk.

Parameters

<code>data_specification</code>	Specification of data to be retrieved
---------------------------------	---------------------------------------

Returns

List of downloaded file locations

6.24.2.3 getConfig()

```
def skdaccess.framework.data_class.DataFetcherBase.getConfig ( ) [inherited]
```

Retrieve skdaccess configuration.

Returns

configParser.ConfigParser object of configuration

6.24.2.4 getDataLocation()

```
def skdaccess.framework.data_class.DataFetcherLocal.getDataLocation (
    data_name ) [inherited]
```

Get the location of data set.

Parameters

<i>data_name</i>	Name of data set
------------------	------------------

Returns

string of data location, None if not found

6.24.2.5 getMetadata()

```
def skdaccess.framework.data_class.DataFetcherBase.getMetadata (
    self ) [inherited]
```

Return metadata about Data Fetcher.

Returns

metadata of object.

6.24.2.6 multirun_enabled()

```
def skdaccess.framework.data_class.DataFetcherCache.multirun_enabled (
    self )
```

Returns whether or not this data fetcher is multirun enabled.

Returns

Boolean indicating whether or not this data fetcher is multirun enabled

6.24.2.7 output()

```
def skdaccess.framework.data_class.DataFetcherBase.output (
    self ) [inherited]
```

Output data wrapper.

Returns

Datawrapper

6.24.2.8 perturb()

```
def skdaccess.framework.data_class.DataFetcherBase.perturb (
    self ) [inherited]
```

Perturb parameters.

6.24.2.9 reset()

```
def skdaccess.framework.data_class.DataFetcherBase.reset (
    self ) [inherited]
```

Set all parameters to initial value.

6.24.2.10 setDataLocation()

```
def skdaccess.framework.data_class.DataFetcherLocal.setDataLocation (
    data_name,
    location,
    key = 'data_location' ) [inherited]
```

Set the location of a data set.

Parameters

<i>data_name</i>	Name of data set
<i>location</i>	Location of data set
<i>key</i>	Key of configuration option

6.24.2.11 writeConfig()

```
def skdaccess.framework.data_class.DataFetcherBase.writeConfig (
    conf ) [inherited]
```

Write config to disk.

Parameters

<i>conf</i>	configparser.ConfigParser object
-------------	----------------------------------

6.24.3 Member Data Documentation

6.24.3.1 ap_paramList

```
skdaccess.framework.data_class.DataFetcherBase.ap_paramList [inherited]
```

The documentation for this class was generated from the following file:

- [framework/data_class.py](#)

6.25 skdaccess.framework.data_class.DataFetcherLocal Class Reference

Data fetcher base class for use when storing data locally.

Inheritance diagram for skdaccess.framework.data_class.DataFetcherLocal:



Public Member Functions

- def [getDataLocation](#) (data_name)
Get the location of data set.
- def [setDataLocation](#) (data_name, location, key='data_location')
Set the location of a data set.
- def [output](#) (self)
Output data wrapper.
- def [perturb](#) (self)
Perturb parameters.
- def [reset](#) (self)
Set all parameters to initial value.
- def [__str__](#) (self)
Generate string description.
- def [getMetadata](#) (self)
Return metadata about Data Fetcher.
- def [getConfig](#) ()
Retrieve skdaccess configuration.
- def [writeConfig](#) (conf)
Write config to disk.
- def [multirun_enabled](#) (self)
Returns whether or not this data fetcher is multirun enabled.

Public Attributes

- [ap_paramList](#)

6.25.1 Detailed Description

Data fetcher base class for use when storing data locally.

6.25.2 Member Function Documentation

6.25.2.1 [__str__\(\)](#)

```
def skdaccess.framework.data_class.DataFetcherBase.__str__ (
    self ) [inherited]
```

Generate string description.

6.25.2.2 getConfig()

```
def skdaccess.framework.data_class.DataFetcherBase.getConfig ( ) [inherited]
```

Retrieve skdaccess configuration.

Returns

configParser.ConfigParser object of configuration

6.25.2.3 getDataLocation()

```
def skdaccess.framework.data_class.DataFetcherLocal.getDataLocation (
    data_name )
```

Get the location of data set.

Parameters

<i>data_name</i>	Name of data set
------------------	------------------

Returns

string of data location, None if not found

6.25.2.4 getMetadata()

```
def skdaccess.framework.data_class.DataFetcherBase.getMetadata (
    self ) [inherited]
```

Return metadata about Data Fetcher.

Returns

metadata of object.

6.25.2.5 multirun_enabled()

```
def skdaccess.framework.data_class.DataFetcherBase.multirun_enabled (
    self ) [inherited]
```

Returns whether or not this data fetcher is multirun enabled.

Returns

Boolean indicating whether or not this data fetcher is multirun enabled

6.25.2.6 output()

```
def skdaccess.framework.data_class.DataFetcherBase.output (
    self ) [inherited]
```

Output data wrapper.

Returns

Datawrapper

6.25.2.7 perturb()

```
def skdaccess.framework.data_class.DataFetcherBase.perturb (
    self ) [inherited]
```

Perturb parameters.

6.25.2.8 reset()

```
def skdaccess.framework.data_class.DataFetcherBase.reset (
    self ) [inherited]
```

Set all parameters to initial value.

6.25.2.9 setDataLocation()

```
def skdaccess.framework.data_class.DataFetcherLocal.setDataLocation (
    data_name,
    location,
    key = 'data_location' )
```

Set the location of a data set.

Parameters

<i>data_name</i>	Name of data set
<i>location</i>	Location of data set
<i>key</i>	Key of configuration option

6.25.2.10 writeConfig()

```
def skdaccess.framework.data_class.DataFetcherBase.writeConfig (
    conf ) [inherited]
```

Write config to disk.

Parameters

<i>conf</i>	configparser.ConfigParser object
-------------	----------------------------------

6.25.3 Member Data Documentation

6.25.3.1 ap_paramList

```
skdaccess.framework.data_class.DataFetcherBase.ap_paramList [inherited]
```

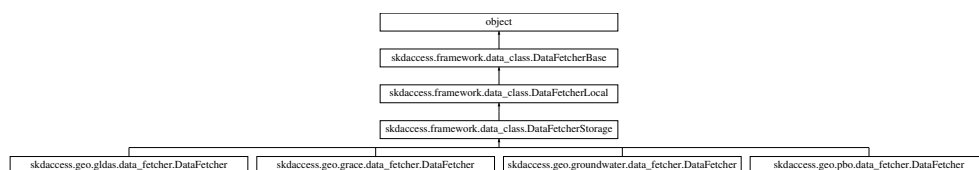
The documentation for this class was generated from the following file:

- framework/[data_class.py](#)

6.26 skdaccess.framework.data_class.DataFetcherStorage Class Reference

Data fetcher base class for use when entire data set is downloaded.

Inheritance diagram for skdaccess.framework.data_class.DataFetcherStorage:



Public Member Functions

- def [downloadFullDataset](#) (cls, out_file, use_file=None)
Abstract function used to download full data set.
- def [multirun_enabled](#) (self)
Returns whether or not this data fetcher is multirun enabled.
- def [getDataLocation](#) (data_name)
Get the location of data set.
- def [setDataLocation](#) (data_name, location, key='data_location')
Set the location of a data set.
- def [output](#) (self)
Output data wrapper.
- def [perturb](#) (self)
Perturb parameters.
- def [reset](#) (self)
Set all parameters to initial value.
- def [__str__](#) (self)
Generate string description.
- def [getMetadata](#) (self)
Return metadata about Data Fetcher.
- def [getConfig](#) ()
Retrieve skdaccess configuration.
- def [writeConfig](#) (conf)
Write config to disk.

Public Attributes

- [ap_paramList](#)

6.26.1 Detailed Description

Data fetcher base class for use when entire data set is downloaded.

6.26.2 Member Function Documentation

6.26.2.1 [__str__\(\)](#)

```
def skdaccess.framework.data_class.DataFetcherBase.__str__ (
    self ) [inherited]
```

Generate string description.

6.26.2.2 downloadFullDataset()

```
def skdaccess.framework.data_class.DataFetcherStorage.downloadFullDataset (
    cls,
    out_file,
    use_file = None )
```

Abstract function used to download full data set.

Parameters

<i>out_file</i>	output file name
<i>use_file</i>	Use previously downloaded data

Returns

Absolute path of parsed data

6.26.2.3 getConfig()

```
def skdaccess.framework.data_class.DataFetcherBase.getConfig ( ) [inherited]
```

Retrieve skdaccess configuration.

Returns

configParser.ConfigParser object of configuration

6.26.2.4 getDataLocation()

```
def skdaccess.framework.data_class.DataFetcherLocal.getDataLocation (
    data_name ) [inherited]
```

Get the location of data set.

Parameters

<i>data_name</i>	Name of data set
------------------	------------------

Returns

string of data location, None if not found

6.26.2.5 getMetadata()

```
def skdaccess.framework.data_class.DataFetcherBase.getMetadata (
    self ) [inherited]
```

Return metadata about Data Fetcher.

Returns

metadata of object.

6.26.2.6 multirun_enabled()

```
def skdaccess.framework.data_class.DataFetcherStorage.multirun_enabled (
    self )
```

Returns whether or not this data fetcher is multirun enabled.

Returns

Boolean indicating whether or not this data fetcher is multirun enabled

6.26.2.7 output()

```
def skdaccess.framework.data_class.DataFetcherBase.output (
    self ) [inherited]
```

Output data wrapper.

Returns

Datawrapper

6.26.2.8 perturb()

```
def skdaccess.framework.data_class.DataFetcherBase.perturb (
    self ) [inherited]
```

Perturb parameters.

6.26.2.9 reset()

```
def skdaccess.framework.data_class.DataFetcherBase.reset (
    self ) [inherited]
```

Set all parameters to initial value.

6.26.2.10 setDataLocation()

```
def skdaccess.framework.data_class.DataFetcherLocal.setDataLocation (
    data_name,
    location,
    key = 'data_location' ) [inherited]
```

Set the location of a data set.

Parameters

<i>data_name</i>	Name of data set
<i>location</i>	Location of data set
<i>key</i>	Key of configuration option

6.26.2.11 writeConfig()

```
def skdaccess.framework.data_class.DataFetcherBase.writeConfig (
    conf ) [inherited]
```

Write config to disk.

Parameters

<i>conf</i>	configparser.ConfigParser object
-------------	----------------------------------

6.26.3 Member Data Documentation

6.26.3.1 ap_paramList

skdaccess.framework.data_class.DataFetcherBase.ap_paramList [inherited]

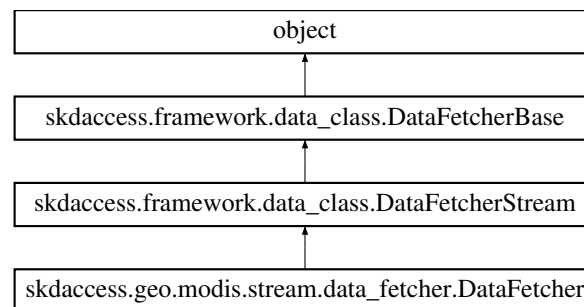
The documentation for this class was generated from the following file:

- framework/[data_class.py](#)

6.27 skdaccess.framework.data_class.DataFetcherStream Class Reference

Data fetcher base class for downloading data into memory.

Inheritance diagram for skdaccess.framework.data_class.DataFetcherStream:



Public Member Functions

- def [retrieveOnlineData](#) (self, data_specification)
Method for downloading data into memory.
- def [multirun_enabled](#) (self)
Returns whether or not this data fetcher is multirun enabled.
- def [output](#) (self)
Output data wrapper.
- def [perturb](#) (self)
Perturb parameters.
- def [reset](#) (self)
Set all parameters to initial value.
- def [__str__](#) (self)
Generate string description.
- def [getMetadata](#) (self)
Return metadata about Data Fetcher.
- def [getConfig](#) ()
Retrieve skdaccess configuration.
- def [writeConfig](#) (conf)
Write config to disk.

Public Attributes

- [ap_paramList](#)

6.27.1 Detailed Description

Data fetcher base class for downloading data into memory.

6.27.2 Member Function Documentation

6.27.2.1 __str__()

```
def skdaccess.framework.data_class.DataFetcherBase.__str__ (
    self ) [inherited]
```

Generate string description.

6.27.2.2 getConfig()

```
def skdaccess.framework.data_class.DataFetcherBase.getConfig ( ) [inherited]
```

Retrieve skdaccess configuration.

Returns

configParser.ConfigParser object of configuration

6.27.2.3 getMetadata()

```
def skdaccess.framework.data_class.DataFetcherBase.getMetadata (
    self ) [inherited]
```

Return metadata about Data Fetcher.

Returns

metadata of object.

6.27.2.4 multirun_enabled()

```
def skdaccess.framework.data_class.DataFetcherStream.multirun_enabled (
    self )
```

Returns whether or not this data fetcher is multirun enabled.

Returns

Boolean indicating whether or not this data fetcher is multirun enabled

6.27.2.5 output()

```
def skdaccess.framework.data_class.DataFetcherBase.output (
    self ) [inherited]
```

Output data wrapper.

Returns

Datawrapper

6.27.2.6 perturb()

```
def skdaccess.framework.data_class.DataFetcherBase.perturb (
    self ) [inherited]
```

Perturb parameters.

6.27.2.7 reset()

```
def skdaccess.framework.data_class.DataFetcherBase.reset (
    self ) [inherited]
```

Set all parameters to initial value.

6.27.2.8 retrieveOnlineData()

```
def skdaccess.framework.data_class.DataFetcherStream.retrieveOnlineData (
    self,
    data_specification )
```

Method for downloading data into memory.

Parameters

<i>data_specification</i>	Url list of data to be retrieved
---------------------------	----------------------------------

Returns

Retrieved data

6.27.2.9 writeConfig()

```
def skdaccess.framework.data_class.DataFetcherBase.writeConfig (
    conf ) [inherited]
```

Write config to disk.

Parameters

<i>conf</i>	configparser.ConfigParser object
-------------	----------------------------------

6.27.3 Member Data Documentation**6.27.3.1 ap_paramList**

```
skdaccess.framework.data_class.DataFetcherBase.ap_paramList [inherited]
```

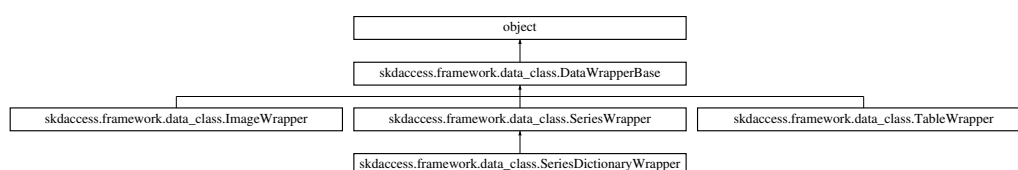
The documentation for this class was generated from the following file:

- framework/[data_class.py](#)

6.28 skdaccess.framework.data_class.DataWrapperBase Class Reference

Base class for wrapping data for use in DiscoveryPipeline.

Inheritance diagram for skdaccess.framework.data_class.DataWrapperBase:



Public Member Functions

- def `__init__` (self, obj_wrap, run_id=-1, meta_data=None)
Construct wrapper from input data.
- def `update` (self, obj)
Updated wrapped data.
- def `get` (self)
Retrieve stored data.
- def `getResults` (self)
Retrieve accumulated results, if any.
- def `addResult` (self, rkey, rres)
Add a result to the data wrapper.
- def `reset` (self)
Reset data back to original state.
- def `info` (self, key=None)
Get information about data wrapper.
- def `getIterator` (self)
Get an iterator to the data.

Public Attributes

- `data`
- `results`
- `constants`
- `run_id`
- `meta_data`

6.28.1 Detailed Description

Base class for wrapping data for use in DiscoveryPipeline.

6.28.2 Constructor & Destructor Documentation

6.28.2.1 `__init__()`

```
def skdaccess.framework.data_class.DataWrapperBase.__init__ (
    self,
    obj_wrap,
    run_id = -1,
    meta_data = None )
```

Construct wrapper from input data.

Parameters

<i>obj_wrap</i>	Data to be wrapped
<i>run_id</i>	ID of the run
<i>meta_data</i>	Metadata to store with data

6.28.3 Member Function Documentation**6.28.3.1 addResult()**

```
def skdaccess.framework.data_class.DataWrapperBase.addResult (
    self,
    rkey,
    rres )
```

Add a result to the data wrapper.

Parameters

<i>rkey</i>	Result key
<i>rres</i>	Result

6.28.3.2 get()

```
def skdaccess.framework.data_class.DataWrapperBase.get (
    self )
```

Retrieve stored data.

Returns

Stored data

6.28.3.3 getIterator()

```
def skdaccess.framework.data_class.DataWrapperBase.getIterator (
    self )
```

Get an iterator to the data.

Returns

iterator to data

6.28.3.4 `getResults()`

```
def skdaccess.framework.data_class.DataWrapperBase.getResults (
    self )
```

Retrieve accumulated results, if any.

Returns

store results

6.28.3.5 `info()`

```
def skdaccess.framework.data_class.DataWrapperBase.info (
    self,
    key = None )
```

Get information about data wrapper.

Returns

The stored metadata

6.28.3.6 `reset()`

```
def skdaccess.framework.data_class.DataWrapperBase.reset (
    self )
```

Reset data back to original state.

6.28.3.7 `update()`

```
def skdaccess.framework.data_class.DataWrapperBase.update (
    self,
    obj )
```

Updated wrapped data.

Parameters

<i>obj</i>	New data for wrapper
------------	----------------------

6.28.4 Member Data Documentation**6.28.4.1 constants**

`skdaccess.framework.data_class.DataWrapperBase.constants`

6.28.4.2 data

`skdaccess.framework.data_class.DataWrapperBase.data`

6.28.4.3 meta_data

`skdaccess.framework.data_class.DataWrapperBase.meta_data`

6.28.4.4 results

`skdaccess.framework.data_class.DataWrapperBase.results`

6.28.4.5 run_id

`skdaccess.framework.data_class.DataWrapperBase.run_id`

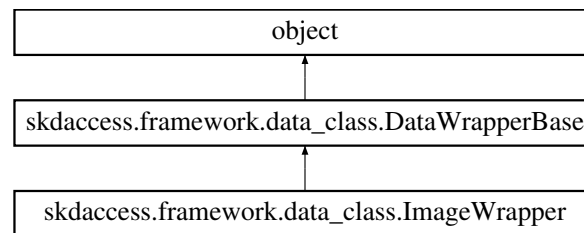
The documentation for this class was generated from the following file:

- framework/[data_class.py](#)

6.29 skdaccess.framework.data_class.ImageWrapper Class Reference

Wrapper for image data.

Inheritance diagram for skdaccess.framework.data_class.ImageWrapper:



Public Member Functions

- def [getIterator](#) (self)
Get an iterator to the data.
- def [updateData](#) (self, label, new_data)
Change image.
- def [deleteData](#) (self, label)
Delete image.
- def [update](#) (self, obj)
Updated wrapped data.
- def [get](#) (self)
Retrieve stored data.
- def [getResults](#) (self)
Retrieve accumulated results, if any.
- def [addResult](#) (self, rkey, rres)
Add a result to the data wrapper.
- def [reset](#) (self)
Reset data back to original state.
- def [info](#) (self, key=None)
Get information about data wrapper.

Public Attributes

- [data](#)
- [results](#)
- [constants](#)
- [run_id](#)
- [meta_data](#)

6.29.1 Detailed Description

Wrapper for image data.

6.29.2 Member Function Documentation

6.29.2.1 addResult()

```
def skdaccess.framework.data_class.DataWrapperBase.addResult (
    self,
    rkey,
    rres ) [inherited]
```

Add a result to the data wrapper.

Parameters

<i>rkey</i>	Result key
<i>rres</i>	Result

6.29.2.2 deleteData()

```
def skdaccess.framework.data_class.ImageWrapper.deleteData (
    self,
    label )
```

Delete image.

Parameters

<i>label</i>	Delete image with label
--------------	-------------------------

6.29.2.3 get()

```
def skdaccess.framework.data_class.DataWrapperBase.get (
    self ) [inherited]
```

Retrieve stored data.

Returns

Stored data

6.29.2.4 getIterator()

```
def skdaccess.framework.data_class.ImageWrapper.getIterator (
    self )
```

Get an iterator to the data.

Returns

Iterator yielding (label, image_data)

6.29.2.5 getResults()

```
def skdaccess.framework.data_class.DataWrapperBase.getResults (
    self ) [inherited]
```

Retrieve accumulated results, if any.

Returns

store results

6.29.2.6 info()

```
def skdaccess.framework.data_class.DataWrapperBase.info (
    self,
    key = None ) [inherited]
```

Get information about data wrapper.

Returns

The stored metadata

6.29.2.7 reset()

```
def skdaccess.framework.data_class.DataWrapperBase.reset (
    self ) [inherited]
```

Reset data back to original state.

6.29.2.8 update()

```
def skdaccess.framework.data_class.DataWrapperBase.update (
    self,
    obj ) [inherited]
```

Updated wrapped data.

Parameters

<i>obj</i>	New data for wrapper
------------	----------------------

6.29.2.9 updateData()

```
def skdaccess.framework.data_class.ImageWrapper.updateData (
    self,
    label,
    new_data )
```

Change image.

Parameters

<i>label</i>	Label of data to be changed
<i>new_data</i>	New data to replace old data

6.29.3 Member Data Documentation**6.29.3.1 constants**

```
skdaccess.framework.data_class.DataWrapperBase.constants [inherited]
```

6.29.3.2 data

```
skdaccess.framework.data_class.DataWrapperBase.data [inherited]
```

6.29.3.3 meta_data

```
skdaccess.framework.data_class.DataWrapperBase.meta_data [inherited]
```

6.29.3.4 results

`skdaccess.framework.data_class.DataWrapperBase.results` [inherited]

6.29.3.5 run_id

`skdaccess.framework.data_class.DataWrapperBase.run_id` [inherited]

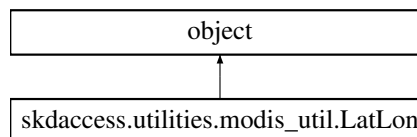
The documentation for this class was generated from the following file:

- framework/[data_class.py](#)

6.30 skdaccess.utilities.modis_util.LatLon Class Reference

Calculates Lat/Lon position from y,x pixel coordinate.

Inheritance diagram for `skdaccess.utilities.modis_util.LatLon`:



Public Member Functions

- `def __init__(self, metadata, x_offset=0, y_offset=0)`
Initialize getLatLon object.
- `def __call__(self, y, x)`
Convert pixel coordinates to lat/lon.

Public Attributes

- [x_offset](#)
- [y_offset](#)
- [lat_data](#)
- [lon_data](#)
- [alat](#)
- [alon](#)

6.30.1 Detailed Description

Calculates Lat/Lon position from y,x pixel coordinate.

6.30.2 Constructor & Destructor Documentation

6.30.2.1 `__init__()`

```
def skdaccess.utilities.modis_util.LatLon.__init__ (
    self,
    metadata,
    x_offset = 0,
    y_offset = 0 )
```

Initialize getLatLon object.

Parameters

<i>metadata</i>	Image metadata
<i>x_offset</i>	Pixel offset (used when gridding data)
<i>y_offset</i>	Pixel offset (used when gridding data)

6.30.3 Member Function Documentation

6.30.3.1 `__call__()`

```
def skdaccess.utilities.modis_util.LatLon.__call__ (
    self,
    y,
    x )
```

Convert pixel coordinates to lat/lon.

Parameters

<i>y</i>	y coordinate
<i>x</i>	x coordinate

Returns

(lat, lon)

6.30.4 Member Data Documentation

6.30.4.1 alat

`skdaccess.utilities.modis_util.LatLon.alat`

6.30.4.2 alon

`skdaccess.utilities.modis_util.LatLon.alon`

6.30.4.3 lat_data

`skdaccess.utilities.modis_util.LatLon.lat_data`

6.30.4.4 lon_data

`skdaccess.utilities.modis_util.LatLon.lon_data`

6.30.4.5 x_offset

`skdaccess.utilities.modis_util.LatLon.x_offset`

6.30.4.6 y_offset

`skdaccess.utilities.modis_util.LatLon.y_offset`

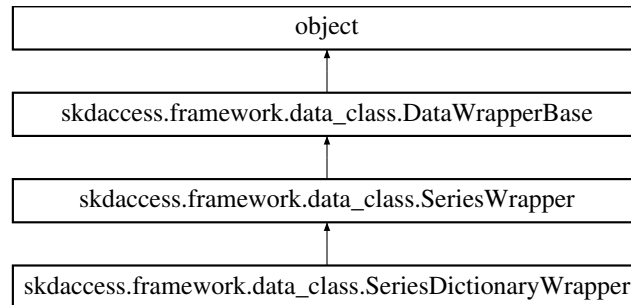
The documentation for this class was generated from the following file:

- [utilities/modis_util.py](#)

6.31 skdaccess.framework.data_class.SeriesDictionaryWrapper Class Reference

Data wrapper for series data using a dictionary of data frames.

Inheritance diagram for skdaccess.framework.data_class.SeriesDictionaryWrapper:



Public Member Functions

- def [getIterator](#) (self)
Get an iterator to the data.
- def [getIndices](#) (self)
Get the indices of the data.
- def [getLength](#) (self)
Get total number of series that the iterate will loop over.
- def [update](#) (self, obj)
Updated wrapped data.
- def [get](#) (self)
Retrieve stored data.
- def [getResults](#) (self)
Retrieve accumulated results, if any.
- def [addResult](#) (self, rkey, rres)
Add a result to the data wrapper.
- def [reset](#) (self)
Reset data back to original state.
- def [info](#) (self, key=None)
Get information about data wrapper.

Public Attributes

- [data_names](#)
- [error_names](#)
- [data](#)
- [results](#)
- [constants](#)
- [run_id](#)
- [meta_data](#)

6.31.1 Detailed Description

Data wrapper for series data using a dictionary of data frames.

6.31.2 Member Function Documentation

6.31.2.1 addResult()

```
def skdaccess.framework.data_class.DataWrapperBase.addResult (
    self,
    rkey,
    rres ) [inherited]
```

Add a result to the data wrapper.

Parameters

<i>rkey</i>	Result key
<i>rres</i>	Result

6.31.2.2 get()

```
def skdaccess.framework.data_class.DataWrapperBase.get (
    self ) [inherited]
```

Retrieve stored data.

Returns

Stored data

6.31.2.3 getIndices()

```
def skdaccess.framework.data_class.SeriesDictionaryWrapper.getIndices (
    self )
```

Get the indices of the data.

Returns

index of data

6.31.2.4 `getIterator()`

```
def skdaccess.framework.data_class.SeriesDictionaryWrapper.getIterator (
    self )
```

Get an iterator to the data.

Returns

Iterator (label, data, errors) that will cycle over data and error names

6.31.2.5 `getLength()`

```
def skdaccess.framework.data_class.SeriesDictionaryWrapper.getLength (
    self )
```

Get total number of series that the iterate will loop over.

Returns

Number of series iterator will traverse over

6.31.2.6 `getResults()`

```
def skdaccess.framework.data_class.DataWrapperBase.getResults (
    self ) [inherited]
```

Retrieve accumulated results, if any.

Returns

store results

6.31.2.7 `info()`

```
def skdaccess.framework.data_class.DataWrapperBase.info (
    self,
    key = None ) [inherited]
```

Get information about data wrapper.

Returns

The stored metadata

6.31.2.8 reset()

```
def skdaccess.framework.data_class.DataWrapperBase.reset (
    self ) [inherited]
```

Reset data back to original state.

6.31.2.9 update()

```
def skdaccess.framework.data_class.DataWrapperBase.update (
    self,
    obj ) [inherited]
```

Updated wrapped data.

Parameters

<i>obj</i>	New data for wrapper
------------	----------------------

6.31.3 Member Data Documentation

6.31.3.1 constants

```
skdaccess.framework.data_class.DataWrapperBase.constants [inherited]
```

6.31.3.2 data

```
skdaccess.framework.data_class.DataWrapperBase.data [inherited]
```

6.31.3.3 data_names

```
skdaccess.framework.data_class.SeriesWrapper.data_names [inherited]
```

6.31.3.4 error_names

`skdaccess.framework.data_class.SeriesWrapper.error_names` [inherited]

6.31.3.5 meta_data

`skdaccess.framework.data_class.DataWrapperBase.meta_data` [inherited]

6.31.3.6 results

`skdaccess.framework.data_class.DataWrapperBase.results` [inherited]

6.31.3.7 run_id

`skdaccess.framework.data_class.DataWrapperBase.run_id` [inherited]

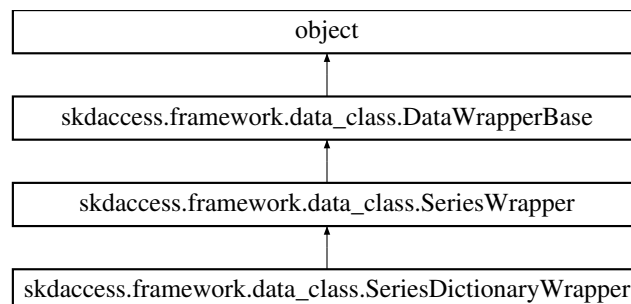
The documentation for this class was generated from the following file:

- framework/[data_class.py](#)

6.32 skdaccess.framework.data_class.SeriesWrapper Class Reference

Data wrapper for series data using a data panel.

Inheritance diagram for `skdaccess.framework.data_class.SeriesWrapper`:



Public Member Functions

- def `__init__` (self, obj_wrap, [data_names](#), [error_names](#)=None, [meta_data](#)=None, [run_id](#)=-1)
Initialize Series Wrapper.
- def [getIterator](#) (self)
Get an iterator to the data.
- def [getIndices](#) (self)
Get the indices of the data.
- def [getLength](#) (self)
Get total number of series that the iterate will loop over.
- def [update](#) (self, obj)
Updated wrapped data.
- def [get](#) (self)
Retrieve stored data.
- def [getResults](#) (self)
Retrieve accumulated results, if any.
- def [addResult](#) (self, rkey, rres)
Add a result to the data wrapper.
- def [reset](#) (self)
Reset data back to original state.
- def [info](#) (self, key=None)
Get information about data wrapper.

Public Attributes

- [data_names](#)
- [error_names](#)
- [data](#)
- [results](#)
- [constants](#)
- [run_id](#)
- [meta_data](#)

6.32.1 Detailed Description

Data wrapper for series data using a data panel.

6.32.2 Constructor & Destructor Documentation

6.32.2.1 `__init__()`

```
def skdaccess.framework.data_class.SeriesWrapper.__init__ (
    self,
    obj_wrap,
    data_names,
    error_names = None,
    meta_data = None,
    run_id = -1 )
```

Initialize Series Wrapper.

Parameters

<i>obj_wrap</i>	Pandas data panel to wrap
<i>data_names</i>	List of data column names
<i>error_names</i>	List of error column names
<i>meta_data</i>	Metadata
<i>run_id</i>	ID of run

6.32.3 Member Function Documentation

6.32.3.1 addResult()

```
def skdaccess.framework.data_class.DataWrapperBase.addResult (
    self,
    rkey,
    rres ) [inherited]
```

Add a result to the data wrapper.

Parameters

<i>rkey</i>	Result key
<i>rres</i>	Result

6.32.3.2 get()

```
def skdaccess.framework.data_class.DataWrapperBase.get (
    self ) [inherited]
```

Retrieve stored data.

Returns

Stored data

6.32.3.3 `getIndices()`

```
def skdaccess.framework.data_class.SeriesWrapper.getIndices (
    self )
```

Get the indices of the data.

Returns

index of data

6.32.3.4 `getIterator()`

```
def skdaccess.framework.data_class.SeriesWrapper.getIterator (
    self )
```

Get an iterator to the data.

Returns

Iterator (label, data, errors) that will cycle over data and error names

6.32.3.5 `getLength()`

```
def skdaccess.framework.data_class.SeriesWrapper.getLength (
    self )
```

Get total number of series that the iterate will loop over.

Returns

Number of series iterator will traverse over

6.32.3.6 `getResults()`

```
def skdaccess.framework.data_class.DataWrapperBase.getResults (
    self ) [inherited]
```

Retrieve accumulated results, if any.

Returns

store results

6.32.3.7 info()

```
def skdaccess.framework.data_class.DataWrapperBase.info (
    self,
    key = None ) [inherited]
```

Get information about data wrapper.

Returns

The stored metadata

6.32.3.8 reset()

```
def skdaccess.framework.data_class.DataWrapperBase.reset (
    self ) [inherited]
```

Reset data back to original state.

6.32.3.9 update()

```
def skdaccess.framework.data_class.DataWrapperBase.update (
    self,
    obj ) [inherited]
```

Updated wrapped data.

Parameters

<i>obj</i>	New data for wrapper
------------	----------------------

6.32.4 Member Data Documentation

6.32.4.1 constants

```
skdaccess.framework.data_class.DataWrapperBase.constants [inherited]
```

6.32.4.2 data

`skdaccess.framework.data_class.DataWrapperBase.data` [inherited]

6.32.4.3 data_names

`skdaccess.framework.data_class.SeriesWrapper.data_names`

6.32.4.4 error_names

`skdaccess.framework.data_class.SeriesWrapper.error_names`

6.32.4.5 meta_data

`skdaccess.framework.data_class.DataWrapperBase.meta_data` [inherited]

6.32.4.6 results

`skdaccess.framework.data_class.DataWrapperBase.results` [inherited]

6.32.4.7 run_id

`skdaccess.framework.data_class.DataWrapperBase.run_id` [inherited]

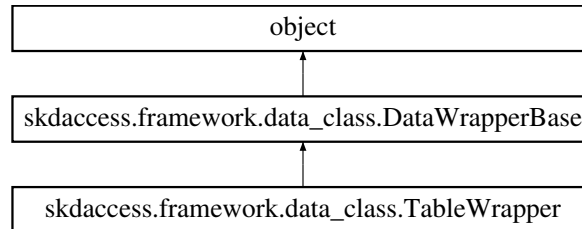
The documentation for this class was generated from the following file:

- framework/[data_class.py](#)

6.33 skdaccess.framework.data_class.TableWrapper Class Reference

Data wrapper for table data using an ordered dictionary.

Inheritance diagram for skdaccess.framework.data_class.TableWrapper:



Public Member Functions

- def `__init__` (self, obj_wrap, run_id=-1, meta_data=None, default_columns=None, default_error_columns=None)
Construct object from input data.
- def `getIterator` (self)
Iterator access to data.
- def `getLength` (self)
Get number of data frames.
- def `updateData` (self, label, index, column_names, new_data)
Update wrapped data.
- def `addColumn` (self, label, column_names, new_data)
Add new column to data.
- def `getDefaultColumns` (self)
Get the default columns of data.
- def `getDefaultErrorColumns` (self)
Get the default error columns of data.
- def `removeFrames` (self, label_list)
Remove Data Frames from wrapper.
- def `updateFrames` (self, label_list, frame_list)
Update data frames.
- def `update` (self, obj)
Updated wrapped data.
- def `get` (self)
Retrieve stored data.
- def `getResults` (self)
Retrieve accumulated results, if any.
- def `addResult` (self, rkey, rres)
Add a result to the data wrapper.
- def `reset` (self)
Reset data back to original state.
- def `info` (self, key=None)
Get information about data wrapper.

Public Attributes

- [default_columns](#)
- [default_error_columns](#)
- [data](#)
- [results](#)
- [constants](#)
- [run_id](#)
- [meta_data](#)

6.33.1 Detailed Description

Data wrapper for table data using an ordered dictionary.

6.33.2 Constructor & Destructor Documentation

6.33.2.1 `__init__()`

```
def skdaccess.framework.data_class.TableWrapper.__init__ (
    self,
    obj_wrap,
    run_id = -1,
    meta_data = None,
    default_columns = None,
    default_error_columns = None )
```

Construct object from input data.

Parameters

<i>obj_wrap</i>	Data to be wrapped
<i>run_id</i>	ID of the run
<i>meta_data</i>	Metadata to store with data
<i>default_columns</i>	Default columns for pipeline items
<i>default_error_columns</i>	Default error columns for pipeline items

6.33.3 Member Function Documentation

6.33.3.1 addColumn()

```
def skdaccess.framework.data_class.TableWrapper.addColumn (
    self,
    label,
    column_names,
    new_data )
```

Add new column to data.

Parameters

<i>label</i>	Data label
<i>column_names</i>	Names of columns to update
<i>new_data</i>	New data to add

6.33.3.2 addResult()

```
def skdaccess.framework.data_class.DataWrapperBase.addResult (
    self,
    rkey,
    rres ) [inherited]
```

Add a result to the data wrapper.

Parameters

<i>rkey</i>	Result key
<i>rres</i>	Result

6.33.3.3 get()

```
def skdaccess.framework.data_class.DataWrapperBase.get (
    self ) [inherited]
```

Retrieve stored data.

Returns

Stored data

6.33.3.4 getDefaultColumns()

```
def skdaccess.framework.data_class.TableWrapper.getDefaultColumns (
    self )
```

Get the default columns of data.

Returns

List of default columns

6.33.3.5 getDefaultErrorColumns()

```
def skdaccess.framework.data_class.TableWrapper.getDefaultErrorColumns (
    self )
```

Get the default error columns of data.

Returns

List of default error columns

6.33.3.6 getIterator()

```
def skdaccess.framework.data_class.TableWrapper.getIterator (
    self )
```

Iterator access to data.

Returns

iterator to (label, data frame) from Dictionary

6.33.3.7 getLength()

```
def skdaccess.framework.data_class.TableWrapper.getLength (
    self )
```

Get number of data frames.

Returns

Number of data frames

6.33.3.8 `getResults()`

```
def skdaccess.framework.data_class.DataWrapperBase.getResults (
    self ) [inherited]
```

Retrieve accumulated results, if any.

Returns

store results

6.33.3.9 `info()`

```
def skdaccess.framework.data_class.DataWrapperBase.info (
    self,
    key = None ) [inherited]
```

Get information about data wrapper.

Returns

The stored metadata

6.33.3.10 `removeFrames()`

```
def skdaccess.framework.data_class.TableWrapper.removeFrames (
    self,
    label_list )
```

Remove Data Frames from wrapper.

Parameters

<i>label_list</i>	List of labels to remove
-------------------	--------------------------

6.33.3.11 `reset()`

```
def skdaccess.framework.data_class.DataWrapperBase.reset (
    self ) [inherited]
```

Reset data back to original state.

6.33.3.12 update()

```
def skdaccess.framework.data_class.DataWrapperBase.update (
    self,
    obj ) [inherited]
```

Updated wrapped data.

Parameters

<i>obj</i>	New data for wrapper
------------	----------------------

6.33.3.13 updateData()

```
def skdaccess.framework.data_class.TableWrapper.updateData (
    self,
    label,
    index,
    column_names,
    new_data )
```

Update wrapped data.

Parameters

<i>label</i>	Data label
<i>index</i>	Index of data to update
<i>column_names</i>	Names of columns to update
<i>new_data</i>	Data to replace the old data

6.33.3.14 updateFrames()

```
def skdaccess.framework.data_class.TableWrapper.updateFrames (
    self,
    label_list,
    frame_list )
```

Update data frames.

Parameters

<i>label_list</i>	List of labels to update
<i>frame_list</i>	List of updated frames

6.33.4 Member Data Documentation

6.33.4.1 constants

`skdaccess.framework.data_class.DataWrapperBase.constants` [inherited]

6.33.4.2 data

`skdaccess.framework.data_class.DataWrapperBase.data` [inherited]

6.33.4.3 default_columns

`skdaccess.framework.data_class.TableWrapper.default_columns`

6.33.4.4 default_error_columns

`skdaccess.framework.data_class.TableWrapper.default_error_columns`

6.33.4.5 meta_data

`skdaccess.framework.data_class.DataWrapperBase.meta_data` [inherited]

6.33.4.6 results

`skdaccess.framework.data_class.DataWrapperBase.results` [inherited]

6.33.4.7 run_id

`skdaccess.framework.data_class.DataWrapperBase.run_id` [inherited]

The documentation for this class was generated from the following file:

- [framework/data_class.py](#)

Chapter 7

File Documentation

7.1 astro/kepler/data_fetcher.py File Reference

Classes

- class [skdaccess.astro.kepler.DataFetcher](#)
Data Fetcher for Kepler light curve data.

Namespaces

- [skdaccess.astro.kepler.data_fetcher](#)

7.2 geo/gldas/data_fetcher.py File Reference

Classes

- class [skdaccess.geo.gldas.DataFetcher](#)
Data Fetcher for GLDAS data.

Namespaces

- [skdaccess.geo.gldas.data_fetcher](#)

7.3 geo/grace/data_fetcher.py File Reference

Classes

- class [skdaccess.geo.grace.DataFetcher](#)
Data Fetcher for GRACE data.

Namespaces

- [skdaccess.geo.grace.data_fetcher](#)

7.4 geo/groundwater/data_fetcher.py File Reference

Classes

- class [skdaccess.geo.groundwater.DataFetcher](#)
Generates Data Wrappers of groundwater measurements taken in the US.

Namespaces

- [skdaccess.geo.groundwater.data_fetcher](#)

7.5 geo/modis/cache/cloud_mask/data_fetcher.py File Reference

Classes

- class [skdaccess.geo.modis.cache.cloud_mask.DataFetcher](#)
Data Fetcher for MODIS Cloud Mask.

Namespaces

- [skdaccess.geo.modis.cache.cloud_mask.data_fetcher](#)

7.6 geo/modis/cache/cloud_opacity/data_fetcher.py File Reference

Classes

- class [skdaccess.geo.modis.cache.cloud_opacity.DataFetcher](#)
Data Fetcher for MODIS Cloud Opacity.

Namespaces

- [skdaccess.geo.modis.cache.cloud_opacity.data_fetcher](#)

7.7 geo/modis/cache/data_fetcher.py File Reference

Classes

- class [skdaccess.geo.modis.cache.DataFetcher](#)
Data Fetcher for MODIS data.

Namespaces

- [skdaccess.geo.modis.cache.data_fetcher](#)

7.8 geo/modis/cache/reflectance/data_fetcher.py File Reference

Classes

- class [skdaccess.geo.modis.cache.reflectance.DataFetcher](#)
Data fetcher for the modis surface reflectance product ('09', 1 km resolution)

Namespaces

- [skdaccess.geo.modis.cache.reflectance.data_fetcher](#)

7.9 geo/modis/stream/cloud_mask/data_fetcher.py File Reference

Classes

- class [skdaccess.geo.modis.stream.cloud_mask.DataFetcher](#)
Data Fetcher for MODIS Cloud Mask.

Namespaces

- [skdaccess.geo.modis.stream.cloud_mask.data_fetcher](#)

7.10 geo/modis/stream/cloud_opacity/data_fetcher.py File Reference

Classes

- class [skdaccess.geo.modis.stream.cloud_opacity.DataFetcher](#)
Data Fetcher for MODIS Cloud Opacity.

Namespaces

- [skdaccess.geo.modis.stream.cloud_opacity.data_fetcher](#)

7.11 geo/modis/stream/data_fetcher.py File Reference

Classes

- class [skdaccess.geo.modis.stream.DataFetcher](#)
Data Fetcher for MODIS data.

Namespaces

- [skdaccess.geo.modis.stream.data_fetcher](#)

7.12 geo/modis/stream/reflectance/data_fetcher.py File Reference

Classes

- class [skdaccess.geo.modis.stream.reflectance.DataFetcher](#)
Data fetcher for the modis surface reflectance product ('09', 1 km resolution)

Namespaces

- [skdaccess.geo.modis.stream.reflectance.data_fetcher](#)

7.13 geo/pbo/data_fetcher.py File Reference

Classes

- class [skdaccess.geo.pbo.DataFetcher](#)
Data fetcher for PBO GPS data.

Namespaces

- [skdaccess.geo.pbo.data_fetcher](#)

7.14 bin/skdaccess.py File Reference

Namespaces

- [skdaccess.bin.skdaccess](#)

Functions

- def [skdaccess.bin.skdaccess.skdaccess_script\(\)](#)
This function defines a script for downloading data.

7.15 framework/data_class.py File Reference

Classes

- class [skdaccess.framework.data_class.DataFetcherBase](#)
Base class for all data fetchers.
- class [skdaccess.framework.data_class.DataFetcherLocal](#)
Data fetcher base class for use when storing data locally.
- class [skdaccess.framework.data_class.DataFetcherStorage](#)
Data fetcher base class for use when entire data set is downloaded.
- class [skdaccess.framework.data_class.DataFetcherStream](#)
Data fetcher base class for downloading data into memory.
- class [skdaccess.framework.data_class.DataFetcherCache](#)
Data fetcher base class for downloading data and caching results on hard disk.
- class [skdaccess.framework.data_class.DataWrapperBase](#)
Base class for wrapping data for use in DiscoveryPipeline.
- class [skdaccess.framework.data_class.SeriesWrapper](#)
Data wrapper for series data using a data panel.
- class [skdaccess.framework.data_class.SeriesDictionaryWrapper](#)
Data wrapper for series data using a dictionary of data frames.
- class [skdaccess.framework.data_class.TableWrapper](#)
Data wrapper for table data using an ordered dictionary.
- class [skdaccess.framework.data_class.ImageWrapper](#)
Wrapper for image data.

Namespaces

- [skdaccess.framework.data_class](#)

7.16 framework/param_class.py File Reference

Classes

- class [skdaccess.framework.param_class.AutoParam](#)
Defines a tunable parameter class inherited by specific subclasses.
- class [skdaccess.framework.param_class.AutoParamMinMax](#)
A tunable parameter with min and max ranges, perturbs to a random value in range.
- class [skdaccess.framework.param_class.AutoParamList](#)
A tunable parameter with a specified list of choices that can be randomly selected via perturb.
- class [skdaccess.framework.param_class.AutoParamListCycle](#)
Cycles through a list of paramters.
- class [skdaccess.framework.param_class.AutoList](#)
Specifies a list for returning selections of lists, as opposed to a single element.
- class [skdaccess.framework.param_class.AutoListSubset](#)
An [AutoList](#) perturber that creates random subsets of a list.
- class [skdaccess.framework.param_class.AutoListPermute](#)
A perturber that permutes a list.
- class [skdaccess.framework.param_class.AutoListRemove](#)
Removes a different single element from the initial list at each perturb call.
- class [skdaccess.framework.param_class.AutoListCycle](#)
An Autolist that cycles through different lists.

Namespaces

- [skdaccess.framework.param_class](#)

7.17 utilities/grace_util.py File Reference

Namespaces

- [skdaccess.utilities.grace_util](#)

Functions

- def [skdaccess.utilities.grace_util.averageDates](#) (dates, round_nearest_day=False)
Compute the average of a pandas series of timestamps.
- def [skdaccess.utilities.grace_util.dateMismatch](#) (dates, days=10)
Check if dates are not within a certain number of days of each other.
- def [skdaccess.utilities.grace_util.computeEWD](#) (grace_data, scale_factor, round_nearest_day=False)
Compute scale corrected equivalent water depth.
- def [skdaccess.utilities.grace_util.readGraceData](#) (filename, lat_name, lon_name, data_name, time=None)
This function reads in netcdf data provided by GRACE Tellus.

7.18 utilities/gw_util.py File Reference

Namespaces

- [skdaccess.utilities.gw_util](#)

Functions

- def [skdaccess.utilities.gw_util.combine_water_heights](#) (in_data)
Combine median and average water heights.

7.19 utilities/kepler_util.py File Reference

Namespaces

- [skdaccess.utilities.kepler_util](#)

Functions

- def [skdaccess.utilities.kepler_util.normalize](#) (in_data, column='PDCSAP_FLUX', group_column='QUARTER')
This function normalizes PDCSAP_FLUX data by quarter by dividing the flux by the median for the quarter.

7.20 utilities/modis_util.py File Reference

Classes

- class [skdaccess.utilities.modis_util.LatLon](#)
Calculates Lat/Lon position from y,x pixel coordinate.

Namespaces

- [skdaccess.utilities.modis_util](#)

Functions

- def [skdaccess.utilities.modis_util.getImageType](#) (in_data)
Determine what type of modis data is being processed.
- def [skdaccess.utilities.modis_util.calibrateModis](#) (data, metadata)
This function calibrates input modis data.
- def [skdaccess.utilities.modis_util.rescale](#) (in_array, max_val=0.9, min_val=-0.01)
This function rescales an image to fall between 0 and 1.
- def [skdaccess.utilities.modis_util.checkBit](#) (data, bit)
Get the bit value from a bit flag.
- def [skdaccess.utilities.modis_util.createGrid](#) (data, y_start, y_end, x_start, x_end, y_grid, x_grid, dtype, grid_fill=np.nan)
Subsets image data into a smaller image.
- def [skdaccess.utilities.modis_util.getFileIDs](#) (modis_identifier, start_date, end_date, lat, lon, daynightboth)
Retrieve file IDs for images matching search parameters.
- def [skdaccess.utilities.modis_util.getFileURLs](#) (file_ids)
Retrieve the ftp location for a list of file IDs.
- def [skdaccess.utilities.modis_util.getModisData](#) (dataset, variable_name)
Loads modis data.
- def [skdaccess.utilities.modis_util.readMODISData](#) (modis_list, variables, grid, grid_fill, use_long_name, platform, product_id)
Retrieve a list of modis data.

7.21 utilities/pbo_util.py File Reference

Namespaces

- [skdaccess.utilities.pbo_util](#)

Functions

- def [skdaccess.utilities.pbo_util.getStationCoords](#) (pbo_info, station_list)
Get the station coordinates for a list of stations.
- def [skdaccess.utilities.pbo_util.getLatLonRange](#) (pbo_info, station_list)
Retrive the range of latitude and longitude occupied by a set of stations.
- def [skdaccess.utilities.pbo_util.getROIstations](#) (geo_point, radiusParam, data, header)
This function returns the 4ID station codes for the stations in a region.
- def [skdaccess.utilities.pbo_util.stab_sys](#) (data_iterator, metadata, stab_min_NE=.0005, stab_min_U=.005, sigsc=2, errProp=1)
Stabilize GPS data to a region.
- def [skdaccess.utilities.pbo_util.propagateErrors](#) (R, sc, stationCovs)
Propagate GPS errors.
- def [skdaccess.utilities.pbo_util.nostab_sys](#) (allH, allD, timerng, indx=1, mdyratio=.7, use_progress_bar=True)
Do not apply stabilization and simply returns stations after checking for sufficient amount of data.
- def [skdaccess.utilities.pbo_util.removeAntennaOffset](#) (antenna_offsets, data, window_start=pd.to_timedelta('4D'), window_end=pd.to_timedelta('4D'), min_diff=0.005, debug=False)
Remove offsets caused by changes in antennas.

Index

`__call__`
 `skdaccess::framework::param_class::AutoList`, 32
 `skdaccess::framework::param_class::AutoListCycle`, 37
 `skdaccess::framework::param_class::AutoList`↔
 `Permute`, 41
 `skdaccess::framework::param_class::AutoList`↔
 `Remove`, 45
 `skdaccess::framework::param_class::AutoList`↔
 `Subset`, 49
 `skdaccess::framework::param_class::AutoParam`, 54
 `skdaccess::framework::param_class::AutoParamList`, 56
 `skdaccess::framework::param_class::AutoParam`↔
 `ListCycle`, 59
 `skdaccess::framework::param_class::AutoParam`↔
 `MinMax`, 62
 `skdaccess::utilities::modis_util::LatLon`, 146
`__getitem__`
 `skdaccess::framework::param_class::AutoList`, 32
 `skdaccess::framework::param_class::AutoListCycle`, 37
 `skdaccess::framework::param_class::AutoList`↔
 `Permute`, 41
 `skdaccess::framework::param_class::AutoList`↔
 `Remove`, 45
 `skdaccess::framework::param_class::AutoList`↔
 `Subset`, 49
`__init__`
 `skdaccess::astro::kepler::data_fetcher::DataFetcher`, 92
 `skdaccess::framework::data_class::DataFetcher`↔
 `Base`, 117
 `skdaccess::framework::data_class::DataWrapper`↔
 `Base`, 137
 `skdaccess::framework::data_class::SeriesWrapper`, 153
 `skdaccess::framework::data_class::TableWrapper`, 160
 `skdaccess::framework::param_class::AutoList`, 32
 `skdaccess::framework::param_class::AutoListCycle`, 36
 `skdaccess::framework::param_class::AutoList`↔
 `Remove`, 45
 `skdaccess::framework::param_class::AutoParam`, 53
 `skdaccess::framework::param_class::AutoParamList`, 56
 `skdaccess::framework::param_class::AutoParam`↔
 `ListCycle`, 59
 `skdaccess::framework::param_class::AutoParam`↔
 `MinMax`, 61
 `skdaccess::geo::gldas::data_fetcher::DataFetcher`, 75
 `skdaccess::geo::grace::data_fetcher::DataFetcher`, 81
 `skdaccess::geo::groundwater::data_fetcher::Data`↔
 `Fetcher`, 86
 `skdaccess::geo::modis::cache::cloud_mask::data`↔
 `fetcher::DataFetcher`, 98
 `skdaccess::geo::modis::cache::cloud_opacity`↔
 `::data_fetcher::DataFetcher`, 99
 `skdaccess::geo::modis::cache::data_fetcher::Data`↔
 `Fetcher`, 101
 `skdaccess::geo::modis::cache::reflectance::data`↔
 `fetcher::DataFetcher`, 65
 `skdaccess::geo::modis::stream::cloud_mask::data`↔
 `_fetcher::DataFetcher`, 109
 `skdaccess::geo::modis::stream::cloud_opacity`↔
 `::data_fetcher::DataFetcher`, 108
 `skdaccess::geo::modis::stream::data_fetcher::`↔
 `DataFetcher`, 111
 `skdaccess::geo::modis::stream::reflectance::data`↔
 `fetcher::DataFetcher`, 66
 `skdaccess::geo::pbo::data_fetcher::DataFetcher`, 68
 `skdaccess::utilities::modis_util::LatLon`, 146
`__len__`
 `skdaccess::framework::param_class::AutoList`, 33
 `skdaccess::framework::param_class::AutoListCycle`, 37
 `skdaccess::framework::param_class::AutoList`↔
 `Permute`, 41
 `skdaccess::framework::param_class::AutoList`↔
 `Remove`, 46
 `skdaccess::framework::param_class::AutoList`↔
 `Subset`, 50
`__setitem__`
 `skdaccess::framework::param_class::AutoList`, 33
 `skdaccess::framework::param_class::AutoListCycle`, 38
 `skdaccess::framework::param_class::AutoList`↔

- Permute, [42](#)
 - skdaccess::framework::param_class::AutoList↔
 - Remove, [46](#)
 - skdaccess::framework::param_class::AutoList↔
 - Subset, [50](#)
 - __str__
 - skdaccess::astro::kepler::data_fetcher::DataFetcher, [93](#)
 - skdaccess::framework::data_class::DataFetcher↔
 - Base, [118](#)
 - skdaccess::framework::data_class::DataFetcher↔
 - Cache, [121](#)
 - skdaccess::framework::data_class::DataFetcher↔
 - Local, [125](#)
 - skdaccess::framework::data_class::DataFetcher↔
 - Storage, [129](#)
 - skdaccess::framework::data_class::DataFetcher↔
 - Stream, [134](#)
 - skdaccess::framework::param_class::AutoList, [33](#)
 - skdaccess::framework::param_class::AutoListCycle, [38](#)
 - skdaccess::framework::param_class::AutoList↔
 - Permute, [42](#)
 - skdaccess::framework::param_class::AutoList↔
 - Remove, [46](#)
 - skdaccess::framework::param_class::AutoList↔
 - Subset, [50](#)
 - skdaccess::framework::param_class::AutoParam, [54](#)
 - skdaccess::framework::param_class::AutoParamList, [56](#)
 - skdaccess::framework::param_class::AutoParam↔
 - ListCycle, [59](#)
 - skdaccess::framework::param_class::AutoParam↔
 - MinMax, [62](#)
 - skdaccess::geo::gldas::data_fetcher::DataFetcher, [76](#)
 - skdaccess::geo::grace::data_fetcher::DataFetcher, [81](#)
 - skdaccess::geo::groundwater::data_fetcher::Data↔
 - Fetcher, [87](#)
 - skdaccess::geo::modis::cache::data_fetcher::Data↔
 - Fetcher, [102](#)
 - skdaccess::geo::modis::stream::data_fetcher::↔
 - DataFetcher, [112](#)
 - skdaccess::geo::pbo::data_fetcher::DataFetcher, [69](#)
 - addColumn
 - skdaccess::framework::data_class::TableWrapper, [160](#)
 - addResult
 - skdaccess::framework::data_class::DataWrapper↔
 - Base, [138](#)
 - skdaccess::framework::data_class::ImageWrapper, [142](#)
 - skdaccess::framework::data_class::SeriesDictionary↔
 - Wrapper, [149](#)
 - skdaccess::framework::data_class::SeriesWrapper, [155](#)
 - skdaccess::framework::data_class::TableWrapper, [161](#)
- alat
 - skdaccess::utilities::modis_util::LatLon, [147](#)
- alon
 - skdaccess::utilities::modis_util::LatLon, [147](#)
- antenna_info
 - skdaccess::geo::pbo::data_fetcher::DataFetcher, [73](#)
- ap_paramList
 - skdaccess::astro::kepler::data_fetcher::DataFetcher, [97](#)
 - skdaccess::framework::data_class::DataFetcher↔
 - Base, [120](#)
 - skdaccess::framework::data_class::DataFetcher↔
 - Cache, [124](#)
 - skdaccess::framework::data_class::DataFetcher↔
 - Local, [128](#)
 - skdaccess::framework::data_class::DataFetcher↔
 - Storage, [133](#)
 - skdaccess::framework::data_class::DataFetcher↔
 - Stream, [136](#)
 - skdaccess::geo::gldas::data_fetcher::DataFetcher, [79](#)
 - skdaccess::geo::grace::data_fetcher::DataFetcher, [85](#)
 - skdaccess::geo::groundwater::data_fetcher::Data↔
 - Fetcher, [91](#)
 - skdaccess::geo::modis::cache::data_fetcher::Data↔
 - Fetcher, [106](#)
 - skdaccess::geo::modis::stream::data_fetcher::↔
 - DataFetcher, [114](#)
 - skdaccess::geo::pbo::data_fetcher::DataFetcher, [73](#)
- astro/kepler/data_fetcher.py, [167](#)
- averageDates
 - skdaccess::utilities::grace_util, [16](#)
- bin/skdaccess.py, [171](#)
- cacheData
 - skdaccess::astro::kepler::data_fetcher::DataFetcher, [93](#)
 - skdaccess::framework::data_class::DataFetcher↔
 - Cache, [121](#)
 - skdaccess::geo::modis::cache::data_fetcher::Data↔
 - Fetcher, [102](#)
- calibrateModis
 - skdaccess::utilities::modis_util, [20](#)
- checkBit
 - skdaccess::utilities::modis_util, [20](#)
- combine_water_heights
 - skdaccess::utilities::gw_util, [18](#)

- computeEWD
 - skdaccess::utilities::grace_util, [17](#)
- constants
 - skdaccess::framework::data_class::DataWrapper↔
Base, [140](#)
 - skdaccess::framework::data_class::ImageWrapper,
[144](#)
 - skdaccess::framework::data_class::SeriesDictionary↔
Wrapper, [151](#)
 - skdaccess::framework::data_class::SeriesWrapper,
[157](#)
 - skdaccess::framework::data_class::TableWrapper,
[165](#)
- createGrid
 - skdaccess::utilities::modis_util, [21](#)
- current_index
 - skdaccess::framework::param_class::AutoParam↔
ListCycle, [60](#)
- cutoff
 - skdaccess::geo::groundwater::data_fetcher::Data↔
Fetcher, [91](#)
- data
 - skdaccess::framework::data_class::DataWrapper↔
Base, [140](#)
 - skdaccess::framework::data_class::ImageWrapper,
[144](#)
 - skdaccess::framework::data_class::SeriesDictionary↔
Wrapper, [151](#)
 - skdaccess::framework::data_class::SeriesWrapper,
[157](#)
 - skdaccess::framework::data_class::TableWrapper,
[165](#)
- data_names
 - skdaccess::framework::data_class::SeriesDictionary↔
Wrapper, [151](#)
 - skdaccess::framework::data_class::SeriesWrapper,
[158](#)
- dateMismatch
 - skdaccess::utilities::grace_util, [17](#)
- daynightboth
 - skdaccess::geo::modis::cache::data_fetcher::Data↔
Fetcher, [106](#)
 - skdaccess::geo::modis::stream::data_fetcher::↔
DataFetcher, [115](#)
- decimals
 - skdaccess::framework::param_class::AutoParam↔
MinMax, [63](#)
- default_columns
 - skdaccess::framework::data_class::TableWrapper,
[165](#)
 - skdaccess::geo::pbo::data_fetcher::DataFetcher, [73](#)
- default_error_columns
 - skdaccess::framework::data_class::TableWrapper,
[165](#)
 - skdaccess::geo::pbo::data_fetcher::DataFetcher, [74](#)
- deleteData
 - skdaccess::framework::data_class::ImageWrapper,
[142](#)
- downloadFullDataset
 - skdaccess::framework::data_class::DataFetcher↔
Storage, [129](#)
 - skdaccess::geo::gldas::data_fetcher::DataFetcher,
[76](#)
 - skdaccess::geo::grace::data_fetcher::DataFetcher,
[82](#)
 - skdaccess::geo::groundwater::data_fetcher::Data↔
Fetcher, [87](#)
 - skdaccess::geo::pbo::data_fetcher::DataFetcher, [69](#)
- downloadKeplerData
 - skdaccess::astro::kepler::data_fetcher::DataFetcher,
[94](#)
- end_date
 - skdaccess::geo::gldas::data_fetcher::DataFetcher,
[79](#)
 - skdaccess::geo::grace::data_fetcher::DataFetcher,
[85](#)
 - skdaccess::geo::groundwater::data_fetcher::Data↔
Fetcher, [91](#)
 - skdaccess::geo::modis::cache::data_fetcher::Data↔
Fetcher, [106](#)
 - skdaccess::geo::modis::stream::data_fetcher::↔
DataFetcher, [115](#)
- error_names
 - skdaccess::framework::data_class::SeriesDictionary↔
Wrapper, [151](#)
 - skdaccess::framework::data_class::SeriesWrapper,
[158](#)
- find_data
 - skdaccess::geo::modis::cache::data_fetcher::Data↔
Fetcher, [103](#)
- framework/data_class.py, [171](#)
- framework/param_class.py, [172](#)
- geo/gldas/data_fetcher.py, [167](#)
- geo/grace/data_fetcher.py, [167](#)
- geo/groundwater/data_fetcher.py, [168](#)
- geo/modis/cache/cloud_mask/data_fetcher.py, [168](#)
- geo/modis/cache/cloud_opacity/data_fetcher.py, [168](#)
- geo/modis/cache/data_fetcher.py, [169](#)
- geo/modis/cache/reflectance/data_fetcher.py, [169](#)
- geo/modis/stream/cloud_mask/data_fetcher.py, [169](#)
- geo/modis/stream/cloud_opacity/data_fetcher.py, [169](#)
- geo/modis/stream/data_fetcher.py, [170](#)
- geo/modis/stream/reflectance/data_fetcher.py, [170](#)
- geo/pbo/data_fetcher.py, [170](#)

- get
 - skdaccess::framework::data_class::DataWrapper↔
Base, [138](#)
 - skdaccess::framework::data_class::ImageWrapper,
[142](#)
 - skdaccess::framework::data_class::SeriesDictionary↔
Wrapper, [149](#)
 - skdaccess::framework::data_class::SeriesWrapper,
[155](#)
 - skdaccess::framework::data_class::TableWrapper,
[161](#)
- getAllOptions
 - skdaccess::framework::param_class::AutoList, [34](#)
 - skdaccess::framework::param_class::AutoListCycle,
[38](#)
 - skdaccess::framework::param_class::AutoList↔
Permute, [42](#)
 - skdaccess::framework::param_class::AutoList↔
Remove, [47](#)
 - skdaccess::framework::param_class::AutoList↔
Subset, [51](#)
- getAntennaLogs
 - skdaccess::geo::pbo::data_fetcher::DataFetcher, [70](#)
- getConfig
 - skdaccess::astro::kepler::data_fetcher::DataFetcher,
[94](#)
 - skdaccess::framework::data_class::DataFetcher↔
Base, [118](#)
 - skdaccess::framework::data_class::DataFetcher↔
Cache, [122](#)
 - skdaccess::framework::data_class::DataFetcher↔
Local, [125](#)
 - skdaccess::framework::data_class::DataFetcher↔
Storage, [130](#)
 - skdaccess::framework::data_class::DataFetcher↔
Stream, [134](#)
 - skdaccess::geo::gldas::data_fetcher::DataFetcher,
[77](#)
 - skdaccess::geo::grace::data_fetcher::DataFetcher,
[82](#)
 - skdaccess::geo::groundwater::data_fetcher::Data↔
Fetcher, [88](#)
 - skdaccess::geo::modis::cache::data_fetcher::Data↔
Fetcher, [103](#)
 - skdaccess::geo::modis::stream::data_fetcher::↔
DataFetcher, [112](#)
 - skdaccess::geo::pbo::data_fetcher::DataFetcher, [70](#)
- getDataLocation
 - skdaccess::astro::kepler::data_fetcher::DataFetcher,
[94](#)
 - skdaccess::framework::data_class::DataFetcher↔
Cache, [122](#)
 - skdaccess::framework::data_class::DataFetcher↔
Local, [126](#)
 - skdaccess::framework::data_class::DataFetcher↔
Storage, [130](#)
 - skdaccess::geo::gldas::data_fetcher::DataFetcher,
[77](#)
 - skdaccess::geo::grace::data_fetcher::DataFetcher,
[82](#)
 - skdaccess::geo::groundwater::data_fetcher::Data↔
Fetcher, [88](#)
 - skdaccess::geo::modis::cache::data_fetcher::Data↔
Fetcher, [103](#)
 - skdaccess::geo::modis::stream::data_fetcher::↔
DataFetcher, [112](#)
 - skdaccess::geo::pbo::data_fetcher::DataFetcher, [70](#)
- getDefaultColumns
 - skdaccess::framework::data_class::TableWrapper,
[161](#)
- getDefaultErrorColumns
 - skdaccess::framework::data_class::TableWrapper,
[162](#)
- getFileIDs
 - skdaccess::utilities::modis_util, [21](#)
- getFileURLs
 - skdaccess::utilities::modis_util, [22](#)
- getImageType
 - skdaccess::utilities::modis_util, [22](#)
- getIndices
 - skdaccess::framework::data_class::SeriesDictionary↔
Wrapper, [149](#)
 - skdaccess::framework::data_class::SeriesWrapper,
[155](#)
- getInfo
 - skdaccess::geo::pbo::data_fetcher::DataFetcher, [70](#)
- getIterator
 - skdaccess::framework::data_class::DataWrapper↔
Base, [138](#)
 - skdaccess::framework::data_class::ImageWrapper,
[142](#)
 - skdaccess::framework::data_class::SeriesDictionary↔
Wrapper, [149](#)
 - skdaccess::framework::data_class::SeriesWrapper,
[156](#)
 - skdaccess::framework::data_class::TableWrapper,
[162](#)
- getLatLonRange
 - skdaccess::utilities::pbo_util, [25](#)
- getLength
 - skdaccess::framework::data_class::SeriesDictionary↔
Wrapper, [150](#)
 - skdaccess::framework::data_class::SeriesWrapper,
[156](#)
 - skdaccess::framework::data_class::TableWrapper,
[162](#)
- getMetadata
 - skdaccess::astro::kepler::data_fetcher::DataFetcher,
[95](#)
 - skdaccess::framework::data_class::DataFetcher↔

- Base, [118](#)
- skdaccess::framework::data_class::DataFetcher↔
 - Cache, [122](#)
 - Local, [126](#)
 - Storage, [131](#)
 - Stream, [134](#)
- skdaccess::geo::gldas::data_fetcher::DataFetcher, [77](#)
- skdaccess::geo::grace::data_fetcher::DataFetcher, [83](#)
- skdaccess::geo::groundwater::data_fetcher::Data↔
 - Fetcher, [88](#)
- skdaccess::geo::modis::cache::data_fetcher::Data↔
 - Fetcher, [104](#)
- skdaccess::geo::modis::stream::data_fetcher::↔
 - DataFetcher, [112](#)
- skdaccess::geo::pbo::data_fetcher::DataFetcher, [71](#)
- getModisData
 - skdaccess::utilities::modis_util, [23](#)
- getROlstations
 - skdaccess::utilities::pbo_util, [25](#)
- getResults
 - skdaccess::framework::data_class::DataWrapper↔
 - Base, [138](#)
 - skdaccess::framework::data_class::ImageWrapper, [143](#)
 - skdaccess::framework::data_class::SeriesDictionary↔
 - Wrapper, [150](#)
 - skdaccess::framework::data_class::SeriesWrapper, [156](#)
 - skdaccess::framework::data_class::TableWrapper, [162](#)
- getStationCoords
 - skdaccess::utilities::pbo_util, [26](#)
- getStationMetadata
 - skdaccess::geo::groundwater::data_fetcher::Data↔
 - Fetcher, [89](#)
 - skdaccess::geo::pbo::data_fetcher::DataFetcher, [71](#)
- grid
 - skdaccess::geo::modis::cache::data_fetcher::Data↔
 - Fetcher, [106](#)
 - skdaccess::geo::modis::stream::data_fetcher::↔
 - DataFetcher, [115](#)
- grid_fill
 - skdaccess::geo::modis::cache::data_fetcher::Data↔
 - Fetcher, [106](#)
 - skdaccess::geo::modis::stream::data_fetcher::↔
 - DataFetcher, [115](#)
- index
 - skdaccess::framework::param_class::AutoListCycle, [39](#)
 - info
 - skdaccess::framework::data_class::DataWrapper↔
 - Base, [139](#)
 - skdaccess::framework::data_class::ImageWrapper, [143](#)
 - skdaccess::framework::data_class::SeriesDictionary↔
 - Wrapper, [150](#)
 - skdaccess::framework::data_class::SeriesWrapper, [156](#)
 - skdaccess::framework::data_class::TableWrapper, [163](#)
 - lat_data
 - skdaccess::utilities::modis_util::LatLon, [147](#)
 - list_val_list
 - skdaccess::framework::param_class::AutoListCycle, [39](#)
 - lon_data
 - skdaccess::utilities::modis_util::LatLon, [147](#)
 - meta_data
 - skdaccess::framework::data_class::DataWrapper↔
 - Base, [140](#)
 - skdaccess::framework::data_class::ImageWrapper, [144](#)
 - skdaccess::framework::data_class::SeriesDictionary↔
 - Wrapper, [152](#)
 - skdaccess::framework::data_class::SeriesWrapper, [158](#)
 - skdaccess::framework::data_class::TableWrapper, [165](#)
 - skdaccess::geo::pbo::data_fetcher::DataFetcher, [74](#)
 - modis_id
 - skdaccess::geo::modis::cache::data_fetcher::Data↔
 - Fetcher, [107](#)
 - skdaccess::geo::modis::stream::data_fetcher::↔
 - DataFetcher, [115](#)
 - modis_identifier
 - skdaccess::geo::modis::cache::data_fetcher::Data↔
 - Fetcher, [107](#)
 - skdaccess::geo::modis::stream::data_fetcher::↔
 - DataFetcher, [115](#)
 - modis_platform
 - skdaccess::geo::modis::cache::data_fetcher::Data↔
 - Fetcher, [107](#)
 - skdaccess::geo::modis::stream::data_fetcher::↔
 - DataFetcher, [115](#)
 - multirun_enabled
 - skdaccess::astro::kepler::data_fetcher::DataFetcher, [95](#)
 - skdaccess::framework::data_class::DataFetcher↔
 - Base, [118](#)

- skdaccess::framework::data_class::DataFetcher↔
 - Cache, [122](#)
- skdaccess::framework::data_class::DataFetcher↔
 - Local, [126](#)
- skdaccess::framework::data_class::DataFetcher↔
 - Storage, [131](#)
- skdaccess::framework::data_class::DataFetcher↔
 - Stream, [134](#)
- skdaccess::geo::gldas::data_fetcher::DataFetcher, [78](#)
- skdaccess::geo::grace::data_fetcher::DataFetcher, [83](#)
- skdaccess::geo::groundwater::data_fetcher::Data↔
 - Fetcher, [89](#)
- skdaccess::geo::modis::cache::data_fetcher::Data↔
 - Fetcher, [104](#)
- skdaccess::geo::modis::stream::data_fetcher::↔
 - DataFetcher, [113](#)
- skdaccess::geo::pbo::data_fetcher::DataFetcher, [71](#)
- n
 - skdaccess::framework::param_class::AutoList↔
 - Remove, [48](#)
 - skdaccess::framework::param_class::AutoParam↔
 - MinMax, [63](#)
- n_max
 - skdaccess::framework::param_class::AutoParam↔
 - MinMax, [63](#)
- normalize
 - skdaccess::utilities::kepler_util, [19](#)
- nostab_sys
 - skdaccess::utilities::pbo_util, [26](#)
- output
 - skdaccess::astro::kepler::data_fetcher::DataFetcher, [95](#)
 - skdaccess::framework::data_class::DataFetcher↔
 - Base, [118](#)
 - skdaccess::framework::data_class::DataFetcher↔
 - Cache, [123](#)
 - skdaccess::framework::data_class::DataFetcher↔
 - Local, [127](#)
 - skdaccess::framework::data_class::DataFetcher↔
 - Storage, [131](#)
 - skdaccess::framework::data_class::DataFetcher↔
 - Stream, [135](#)
 - skdaccess::geo::gldas::data_fetcher::DataFetcher, [78](#)
 - skdaccess::geo::grace::data_fetcher::DataFetcher, [83](#)
 - skdaccess::geo::groundwater::data_fetcher::Data↔
 - Fetcher, [89](#)
 - skdaccess::geo::modis::cache::data_fetcher::Data↔
 - Fetcher, [105](#)
 - skdaccess::geo::modis::stream::data_fetcher::↔
 - DataFetcher, [113](#)
 - skdaccess::geo::pbo::data_fetcher::DataFetcher, [72](#)
- propagateErrors
 - skdaccess::utilities::pbo_util, [27](#)
- quarter_list
 - skdaccess::astro::kepler::data_fetcher::DataFetcher, [97](#)
- readGraceData
 - skdaccess::utilities::grace_util, [18](#)
- readMODISData
 - skdaccess::utilities::modis_util, [23](#)
- skdaccess::geo::modis::stream::data_fetcher::↔
 - DataFetcher, [113](#)
- skdaccess::geo::pbo::data_fetcher::DataFetcher, [71](#)
- perturb
 - skdaccess::astro::kepler::data_fetcher::DataFetcher, [96](#)
 - skdaccess::framework::data_class::DataFetcher↔
 - Base, [119](#)
 - skdaccess::framework::data_class::DataFetcher↔
 - Cache, [123](#)
 - skdaccess::framework::data_class::DataFetcher↔
 - Local, [127](#)
 - skdaccess::framework::data_class::DataFetcher↔
 - Storage, [131](#)
 - skdaccess::framework::data_class::DataFetcher↔
 - Stream, [135](#)
 - skdaccess::framework::param_class::AutoList, [34](#)
 - skdaccess::framework::param_class::AutoListCycle, [38](#)
 - skdaccess::framework::param_class::AutoList↔
 - Permute, [43](#)
 - skdaccess::framework::param_class::AutoList↔
 - Remove, [47](#)
 - skdaccess::framework::param_class::AutoList↔
 - Subset, [51](#)
 - skdaccess::framework::param_class::AutoParam, [54](#)
 - skdaccess::framework::param_class::AutoParamList, [57](#)
 - skdaccess::framework::param_class::AutoParam↔
 - ListCycle, [59](#)
 - skdaccess::framework::param_class::AutoParam↔
 - MinMax, [62](#)
 - skdaccess::geo::gldas::data_fetcher::DataFetcher, [78](#)
 - skdaccess::geo::grace::data_fetcher::DataFetcher, [83](#)
 - skdaccess::geo::groundwater::data_fetcher::Data↔
 - Fetcher, [89](#)
 - skdaccess::geo::modis::cache::data_fetcher::Data↔
 - Fetcher, [105](#)
 - skdaccess::geo::modis::stream::data_fetcher::↔
 - DataFetcher, [113](#)
 - skdaccess::geo::pbo::data_fetcher::DataFetcher, [72](#)

- removeAntennaOffset
 - skdaccess::utilities::pbo_util, [27](#)
- removeFrames
 - skdaccess::framework::data_class::TableWrapper, [163](#)
- resample
 - skdaccess::geo::gldas::data_fetcher::DataFetcher, [79](#)
- rescale
 - skdaccess::utilities::modis_util, [24](#)
- reset
 - skdaccess::astro::kepler::data_fetcher::DataFetcher, [96](#)
 - skdaccess::framework::data_class::DataFetcher↔Base, [119](#)
 - skdaccess::framework::data_class::DataFetcher↔Cache, [123](#)
 - skdaccess::framework::data_class::DataFetcher↔Local, [127](#)
 - skdaccess::framework::data_class::DataFetcher↔Storage, [132](#)
 - skdaccess::framework::data_class::DataFetcher↔Stream, [135](#)
 - skdaccess::framework::data_class::DataWrapper↔Base, [139](#)
 - skdaccess::framework::data_class::ImageWrapper, [143](#)
 - skdaccess::framework::data_class::SeriesDictionary↔Wrapper, [150](#)
 - skdaccess::framework::data_class::SeriesWrapper, [157](#)
 - skdaccess::framework::data_class::TableWrapper, [163](#)
 - skdaccess::framework::param_class::AutoList, [34](#)
 - skdaccess::framework::param_class::AutoListCycle, [39](#)
 - skdaccess::framework::param_class::AutoList↔Permute, [43](#)
 - skdaccess::framework::param_class::AutoList↔Remove, [47](#)
 - skdaccess::framework::param_class::AutoList↔Subset, [51](#)
 - skdaccess::framework::param_class::AutoParam, [54](#)
 - skdaccess::framework::param_class::AutoParamList, [57](#)
 - skdaccess::framework::param_class::AutoParam↔ListCycle, [60](#)
 - skdaccess::framework::param_class::AutoParam↔MinMax, [63](#)
 - skdaccess::geo::gldas::data_fetcher::DataFetcher, [78](#)
 - skdaccess::geo::grace::data_fetcher::DataFetcher, [84](#)
 - skdaccess::geo::groundwater::data_fetcher::Data↔Fetcher, [90](#)
 - skdaccess::geo::modis::cache::data_fetcher::Data↔Fetcher, [105](#)
 - skdaccess::geo::pbo::data_fetcher::DataFetcher, [72](#)
- results
 - skdaccess::framework::data_class::DataWrapper↔Base, [140](#)
 - skdaccess::framework::data_class::ImageWrapper, [144](#)
 - skdaccess::framework::data_class::SeriesDictionary↔Wrapper, [152](#)
 - skdaccess::framework::data_class::SeriesWrapper, [158](#)
 - skdaccess::framework::data_class::TableWrapper, [165](#)
- retrieveOnlineData
 - skdaccess::framework::data_class::DataFetcher↔Stream, [135](#)
 - skdaccess::geo::modis::stream::data_fetcher::↔DataFetcher, [114](#)
- run_id
 - skdaccess::framework::data_class::DataWrapper↔Base, [140](#)
 - skdaccess::framework::data_class::ImageWrapper, [145](#)
 - skdaccess::framework::data_class::SeriesDictionary↔Wrapper, [152](#)
 - skdaccess::framework::data_class::SeriesWrapper, [158](#)
 - skdaccess::framework::data_class::TableWrapper, [165](#)
- setDataLocation
 - skdaccess::astro::kepler::data_fetcher::DataFetcher, [96](#)
 - skdaccess::framework::data_class::DataFetcher↔Cache, [123](#)
 - skdaccess::framework::data_class::DataFetcher↔Local, [127](#)
 - skdaccess::framework::data_class::DataFetcher↔Storage, [132](#)
 - skdaccess::geo::gldas::data_fetcher::DataFetcher, [78](#)
 - skdaccess::geo::grace::data_fetcher::DataFetcher, [84](#)
 - skdaccess::geo::groundwater::data_fetcher::Data↔Fetcher, [90](#)
 - skdaccess::geo::modis::cache::data_fetcher::Data↔Fetcher, [105](#)
 - skdaccess::geo::pbo::data_fetcher::DataFetcher, [72](#)
- setStationList
 - skdaccess::geo::pbo::data_fetcher::DataFetcher, [73](#)

- skdaccess, 9
- skdaccess.astro, 9
- skdaccess.astro.kepler, 9
- skdaccess.astro.kepler.data_fetcher, 9
- skdaccess.astro.kepler.DataFetcher, 91
- skdaccess.bin, 10
- skdaccess.bin.skdaccess, 10
- skdaccess.framework, 10
- skdaccess.framework.data_class, 11
- skdaccess.framework.data_class.DataFetcherBase, 116
- skdaccess.framework.data_class.DataFetcherCache, 120
- skdaccess.framework.data_class.DataFetcherLocal, 124
- skdaccess.framework.data_class.DataFetcherStorage, 128
- skdaccess.framework.data_class.DataFetcherStream, 133
- skdaccess.framework.data_class.DataWrapperBase, 136
- skdaccess.framework.data_class.ImageWrapper, 141
- skdaccess.framework.data_class.SeriesDictionary←Wrapper, 148
- skdaccess.framework.data_class.SeriesWrapper, 152
- skdaccess.framework.data_class.TableWrapper, 159
- skdaccess.framework.param_class, 11
- skdaccess.framework.param_class.AutoList, 31
- skdaccess.framework.param_class.AutoListCycle, 35
- skdaccess.framework.param_class.AutoListPermute, 40
- skdaccess.framework.param_class.AutoListRemove, 44
- skdaccess.framework.param_class.AutoListSubset, 48
- skdaccess.framework.param_class.AutoParam, 52
- skdaccess.framework.param_class.AutoParamList, 55
- skdaccess.framework.param_class.AutoParamListCycle, 58
- skdaccess.framework.param_class.AutoParamMinMax, 61
- skdaccess.geo, 12
- skdaccess.geo.gldas, 12
- skdaccess.geo.gldas.data_fetcher, 12
- skdaccess.geo.gldas.DataFetcher, 74
- skdaccess.geo.grace, 12
- skdaccess.geo.grace.data_fetcher, 12
- skdaccess.geo.grace.DataFetcher, 80
- skdaccess.geo.groundwater, 12
- skdaccess.geo.groundwater.data_fetcher, 13
- skdaccess.geo.groundwater.DataFetcher, 85
- skdaccess.geo.modis, 13
- skdaccess.geo.modis.cache, 13
- skdaccess.geo.modis.cache.cloud_mask, 13
- skdaccess.geo.modis.cache.cloud_mask.data_fetcher, 13
- skdaccess.geo.modis.cache.cloud_mask.DataFetcher, 97
- skdaccess.geo.modis.cache.cloud_opacity, 13
- skdaccess.geo.modis.cache.cloud_opacity.data_fetcher, 14
- skdaccess.geo.modis.cache.cloud_opacity.DataFetcher, 98
- skdaccess.geo.modis.cache.data_fetcher, 14
- skdaccess.geo.modis.cache.DataFetcher, 100
- skdaccess.geo.modis.cache.reflectance, 14
- skdaccess.geo.modis.cache.reflectance.data_fetcher, 14
- skdaccess.geo.modis.cache.reflectance.DataFetcher, 64
- skdaccess.geo.modis.stream, 14
- skdaccess.geo.modis.stream.cloud_mask, 14
- skdaccess.geo.modis.stream.cloud_mask.data_fetcher, 15
- skdaccess.geo.modis.stream.cloud_mask.DataFetcher, 109
- skdaccess.geo.modis.stream.cloud_opacity, 15
- skdaccess.geo.modis.stream.cloud_opacity.data_fetcher, 15
- skdaccess.geo.modis.stream.cloud_opacity.DataFetcher, 108
- skdaccess.geo.modis.stream.data_fetcher, 15
- skdaccess.geo.modis.stream.DataFetcher, 110
- skdaccess.geo.modis.stream.reflectance, 15
- skdaccess.geo.modis.stream.reflectance.data_fetcher, 15
- skdaccess.geo.modis.stream.reflectance.DataFetcher, 65
- skdaccess.geo.pbo, 16
- skdaccess.geo.pbo.data_fetcher, 16
- skdaccess.geo.pbo.DataFetcher, 67
- skdaccess.utilities, 16
- skdaccess.utilities.grace_util, 16
- skdaccess.utilities.gw_util, 18
- skdaccess.utilities.kepler_util, 19
- skdaccess.utilities.modis_util, 19
- skdaccess.utilities.modis_util.LatLon, 145
- skdaccess.utilities.pbo_util, 24
- skdaccess::astro::kepler::data_fetcher::DataFetcher
 - __init__, 92
 - __str__, 93
 - ap_paramList, 97
 - cacheData, 93
 - downloadKeplerData, 94
 - getConfig, 94
 - getDataLocation, 94
 - getMetadata, 95
 - multirun_enabled, 95
 - output, 95
 - perturb, 96
 - quarter_list, 97
 - reset, 96
 - setDataLocation, 96
 - writeConfig, 97
- skdaccess::bin::skdaccess
 - skdaccess_script, 10
- skdaccess::framework::data_class::DataFetcherBase
 - __init__, 117
 - __str__, 118
 - ap_paramList, 120
 - getConfig, 118

- getMetadata, 118
- multirun_enabled, 118
- output, 118
- perturb, 119
- reset, 119
- writeConfig, 119
- skdaccess::framework::data_class::DataFetcherCache
 - __str__, 121
 - ap_paramList, 124
 - cacheData, 121
 - getConfig, 122
 - getDataLocation, 122
 - getMetadata, 122
 - multirun_enabled, 122
 - output, 123
 - perturb, 123
 - reset, 123
 - setDataLocation, 123
 - writeConfig, 124
- skdaccess::framework::data_class::DataFetcherLocal
 - __str__, 125
 - ap_paramList, 128
 - getConfig, 125
 - getDataLocation, 126
 - getMetadata, 126
 - multirun_enabled, 126
 - output, 127
 - perturb, 127
 - reset, 127
 - setDataLocation, 127
 - writeConfig, 128
- skdaccess::framework::data_class::DataFetcherStorage
 - __str__, 129
 - ap_paramList, 133
 - downloadFullDataset, 129
 - getConfig, 130
 - getDataLocation, 130
 - getMetadata, 131
 - multirun_enabled, 131
 - output, 131
 - perturb, 131
 - reset, 132
 - setDataLocation, 132
 - writeConfig, 132
- skdaccess::framework::data_class::DataFetcherStream
 - __str__, 134
 - ap_paramList, 136
 - getConfig, 134
 - getMetadata, 134
 - multirun_enabled, 134
 - output, 135
 - perturb, 135
 - reset, 135
 - retrieveOnlineData, 135
 - writeConfig, 136
- skdaccess::framework::data_class::DataWrapperBase
 - __init__, 137
 - addResult, 138
 - constants, 140
 - data, 140
 - get, 138
 - getIterator, 138
 - getResults, 138
 - info, 139
 - meta_data, 140
 - reset, 139
 - results, 140
 - run_id, 140
 - update, 139
- skdaccess::framework::data_class::ImageWrapper
 - addResult, 142
 - constants, 144
 - data, 144
 - deleteData, 142
 - get, 142
 - getIterator, 142
 - getResults, 143
 - info, 143
 - meta_data, 144
 - reset, 143
 - results, 144
 - run_id, 145
 - update, 143
 - updateData, 144
- skdaccess::framework::data_class::SeriesDictionary↵
 - Wrapper
 - addResult, 149
 - constants, 151
 - data, 151
 - data_names, 151
 - error_names, 151
 - get, 149
 - getIndices, 149
 - getIterator, 149
 - getLength, 150
 - getResults, 150
 - info, 150
 - meta_data, 152
 - reset, 150
 - results, 152
 - run_id, 152
 - update, 151
- skdaccess::framework::data_class::SeriesWrapper
 - __init__, 153
 - addResult, 155
 - constants, 157
 - data, 157
 - data_names, 158

error_names, 158
 get, 155
 getIndices, 155
 getIterator, 156
 getLength, 156
 getResults, 156
 info, 156
 meta_data, 158
 reset, 157
 results, 158
 run_id, 158
 update, 157
 skdaccess::framework::data_class::TableWrapper
 __init__, 160
 addColumn, 160
 addResult, 161
 constants, 165
 data, 165
 default_columns, 165
 default_error_columns, 165
 get, 161
 getDefaultColumns, 161
 getDefaultErrorColumns, 162
 getIterator, 162
 getLength, 162
 getResults, 162
 info, 163
 meta_data, 165
 removeFrames, 163
 reset, 163
 results, 165
 run_id, 165
 update, 164
 updateData, 164
 updateFrames, 164
 skdaccess::framework::param_class::AutoList
 __call__, 32
 __getitem__, 32
 __init__, 32
 __len__, 33
 __setitem__, 33
 __str__, 33
 getAllOptions, 34
 perturb, 34
 reset, 34
 val, 34
 val_init, 35
 val_list, 35
 skdaccess::framework::param_class::AutoListCycle
 __call__, 37
 __getitem__, 37
 __init__, 36
 __len__, 37
 __setitem__, 38
 __str__, 38
 getAllOptions, 38
 index, 39
 list_val_list, 39
 perturb, 38
 reset, 39
 val, 39
 val_init, 39
 val_list, 40
 skdaccess::framework::param_class::AutoListPermute
 __call__, 41
 __getitem__, 41
 __len__, 41
 __setitem__, 42
 __str__, 42
 getAllOptions, 42
 perturb, 43
 reset, 43
 val, 43
 val_init, 43
 val_list, 44
 skdaccess::framework::param_class::AutoListRemove
 __call__, 45
 __getitem__, 45
 __init__, 45
 __len__, 46
 __setitem__, 46
 __str__, 46
 getAllOptions, 47
 n, 48
 perturb, 47
 reset, 47
 val, 47
 val_init, 48
 val_list, 48
 skdaccess::framework::param_class::AutoListSubset
 __call__, 49
 __getitem__, 49
 __len__, 50
 __setitem__, 50
 __str__, 50
 getAllOptions, 51
 perturb, 51
 reset, 51
 val, 51
 val_init, 52
 val_list, 52
 skdaccess::framework::param_class::AutoParam
 __call__, 54
 __init__, 53
 __str__, 54
 perturb, 54
 reset, 54
 val, 55

- val_init, 55
- skdaccess::framework::param_class::AutoParamList
 - __call__, 56
 - __init__, 56
 - __str__, 56
 - perturb, 57
 - reset, 57
 - val, 57
 - val_init, 57
 - val_list, 57
- skdaccess::framework::param_class::AutoParamListCycle
 - __call__, 59
 - __init__, 59
 - __str__, 59
 - current_index, 60
 - perturb, 59
 - reset, 60
 - val, 60
 - val_init, 60
 - val_list, 60
- skdaccess::framework::param_class::AutoParamMinMax
 - __call__, 62
 - __init__, 61
 - __str__, 62
 - decimals, 63
 - n, 63
 - n_max, 63
 - perturb, 62
 - reset, 63
 - val, 63
 - val_init, 63
 - val_max, 64
 - val_min, 64
- skdaccess::geo::gldas::data_fetcher::DataFetcher
 - __init__, 75
 - __str__, 76
 - ap_paramList, 79
 - downloadFullDataset, 76
 - end_date, 79
 - getConfig, 77
 - getDataLocation, 77
 - getMetadata, 77
 - multirun_enabled, 78
 - output, 78
 - perturb, 78
 - resample, 79
 - reset, 78
 - setDataLocation, 78
 - start_date, 79
 - writeConfig, 79
- skdaccess::geo::grace::data_fetcher::DataFetcher
 - __init__, 81
 - __str__, 81
 - ap_paramList, 85
 - downloadFullDataset, 82
 - end_date, 85
 - getConfig, 82
 - getDataLocation, 82
 - getMetadata, 83
 - multirun_enabled, 83
 - output, 83
 - perturb, 83
 - reset, 84
 - setDataLocation, 84
 - start_date, 85
 - writeConfig, 84
- skdaccess::geo::groundwater::data_fetcher::DataFetcher
 - __init__, 86
 - __str__, 87
 - ap_paramList, 91
 - cutoff, 91
 - downloadFullDataset, 87
 - end_date, 91
 - getConfig, 88
 - getDataLocation, 88
 - getMetadata, 88
 - getStationMetadata, 89
 - multirun_enabled, 89
 - output, 89
 - perturb, 89
 - reset, 90
 - setDataLocation, 90
 - start_date, 91
 - writeConfig, 90
- skdaccess::geo::modis::cache::cloud_mask::data_fetcher::DataFetcher
 - __init__, 98
- skdaccess::geo::modis::cache::cloud_opacity::data_fetcher::DataFetcher
 - __init__, 99
- skdaccess::geo::modis::cache::data_fetcher::DataFetcher
 - __init__, 101
 - __str__, 102
 - ap_paramList, 106
 - cacheData, 102
 - daynightboth, 106
 - end_date, 106
 - find_data, 103
 - getConfig, 103
 - getDataLocation, 103
 - getMetadata, 104
 - grid, 106
 - grid_fill, 106
 - modis_id, 107
 - modis_identifier, 107
 - modis_platform, 107
 - multirun_enabled, 104
 - output, 104

- perturb, 105
- reset, 105
- setDataLocation, 105
- start_date, 107
- use_long_name, 107
- variable_list, 107
- writeConfig, 106
- skdaccess::geo::modis::cache::reflectance::data_↔
 - fetcher::DataFetcher
 - __init__, 65
- skdaccess::geo::modis::stream::cloud_mask::data_↔
 - fetcher::DataFetcher
 - __init__, 109
- skdaccess::geo::modis::stream::cloud_opacity::data_↔
 - fetcher::DataFetcher
 - __init__, 108
- skdaccess::geo::modis::stream::data_fetcher::Data↔
 - Fetcher
 - __init__, 111
 - __str__, 112
 - ap_paramList, 114
 - daynightboth, 115
 - end_date, 115
 - getConfig, 112
 - getMetadata, 112
 - grid, 115
 - grid_fill, 115
 - modis_id, 115
 - modis_identifier, 115
 - modis_platform, 115
 - multirun_enabled, 113
 - output, 113
 - perturb, 113
 - reset, 113
 - retrieveOnlineData, 114
 - start_date, 116
 - use_long_name, 116
 - variable_list, 116
 - writeConfig, 114
- skdaccess::geo::modis::stream::reflectance::data_↔
 - fetcher::DataFetcher
 - __init__, 66
- skdaccess::geo::pbo::data_fetcher::DataFetcher
 - __init__, 68
 - __str__, 69
 - antenna_info, 73
 - ap_paramList, 73
 - default_columns, 73
 - default_error_columns, 74
 - downloadFullDataset, 69
 - getAntennaLogs, 70
 - getConfig, 70
 - getDataLocation, 70
 - getInfo, 70
 - getMetadata, 71
 - getStationMetadata, 71
 - meta_data, 74
 - multirun_enabled, 71
 - output, 71
 - perturb, 72
 - reset, 72
 - setDataLocation, 72
 - setStationList, 73
 - station_list, 74
 - use_progress_bar, 74
 - writeConfig, 73
- skdaccess::utilities::grace_util
 - averageDates, 16
 - computeEWD, 17
 - dateMismatch, 17
 - readGraceData, 18
- skdaccess::utilities::gw_util
 - combine_water_heights, 18
- skdaccess::utilities::kepler_util
 - normalize, 19
- skdaccess::utilities::modis_util
 - calibrateModis, 20
 - checkBit, 20
 - createGrid, 21
 - getFileIDs, 21
 - getFileURLs, 22
 - getImageType, 22
 - getModisData, 23
 - readMODISData, 23
 - rescale, 24
- skdaccess::utilities::modis_util::LatLon
 - __call__, 146
 - __init__, 146
 - alat, 147
 - alon, 147
 - lat_data, 147
 - lon_data, 147
 - x_offset, 147
 - y_offset, 147
- skdaccess::utilities::pbo_util
 - getLatLonRange, 25
 - getROIstations, 25
 - getStationCoords, 26
 - nostab_sys, 26
 - propagateErrors, 27
 - removeAntennaOffset, 27
 - stab_sys, 28
- skdaccess_script
 - skdaccess::bin::skdaccess, 10
- stab_sys
 - skdaccess::utilities::pbo_util, 28
- start_date

- skdaccess::geo::gldas::data_fetcher::DataFetcher, 79
- skdaccess::geo::grace::data_fetcher::DataFetcher, 85
- skdaccess::geo::groundwater::data_fetcher::DataFetcher, 91
- skdaccess::geo::modis::cache::data_fetcher::DataFetcher, 107
- skdaccess::geo::modis::stream::data_fetcher::DataFetcher, 116
- station_list
 - skdaccess::geo::pbo::data_fetcher::DataFetcher, 74
- update
 - skdaccess::framework::data_class::DataWrapperBase, 139
 - skdaccess::framework::data_class::ImageWrapper, 143
 - skdaccess::framework::data_class::SeriesDictionaryWrapper, 151
 - skdaccess::framework::data_class::SeriesWrapper, 157
 - skdaccess::framework::data_class::TableWrapper, 164
- updateData
 - skdaccess::framework::data_class::ImageWrapper, 144
 - skdaccess::framework::data_class::TableWrapper, 164
- updateFrames
 - skdaccess::framework::data_class::TableWrapper, 164
- use_long_name
 - skdaccess::geo::modis::cache::data_fetcher::DataFetcher, 107
 - skdaccess::geo::modis::stream::data_fetcher::DataFetcher, 116
- use_progress_bar
 - skdaccess::geo::pbo::data_fetcher::DataFetcher, 74
- utilities/grace_util.py, 172
- utilities/gw_util.py, 173
- utilities/kepler_util.py, 173
- utilities/modis_util.py, 173
- utilities/pbo_util.py, 174
- val
 - skdaccess::framework::param_class::AutoList, 34
 - skdaccess::framework::param_class::AutoListCycle, 39
 - skdaccess::framework::param_class::AutoListPermute, 43
 - skdaccess::framework::param_class::AutoListRemove, 47
 - skdaccess::framework::param_class::AutoListSubset, 51
 - skdaccess::framework::param_class::AutoParam, 55
 - skdaccess::framework::param_class::AutoParamList, 57
 - skdaccess::framework::param_class::AutoParamListCycle, 60
 - skdaccess::framework::param_class::AutoParamMinMax, 63
- val_init
 - skdaccess::framework::param_class::AutoList, 35
 - skdaccess::framework::param_class::AutoListCycle, 39
 - skdaccess::framework::param_class::AutoListPermute, 43
 - skdaccess::framework::param_class::AutoListRemove, 48
 - skdaccess::framework::param_class::AutoListSubset, 52
 - skdaccess::framework::param_class::AutoParam, 55
 - skdaccess::framework::param_class::AutoParamList, 57
 - skdaccess::framework::param_class::AutoParamListCycle, 60
 - skdaccess::framework::param_class::AutoParamMinMax, 63
- val_list
 - skdaccess::framework::param_class::AutoList, 35
 - skdaccess::framework::param_class::AutoListCycle, 40
 - skdaccess::framework::param_class::AutoListPermute, 44
 - skdaccess::framework::param_class::AutoListRemove, 48
 - skdaccess::framework::param_class::AutoListSubset, 52
 - skdaccess::framework::param_class::AutoParamList, 57
 - skdaccess::framework::param_class::AutoParamListCycle, 60
- val_max
 - skdaccess::framework::param_class::AutoParamMinMax, 64
- val_min
 - skdaccess::framework::param_class::AutoParamMinMax, 64
- variable_list
 - skdaccess::geo::modis::cache::data_fetcher::DataFetcher, 107
 - skdaccess::geo::modis::stream::data_fetcher::DataFetcher, 116
- writeConfig
 - skdaccess::astro::kepler::data_fetcher::DataFetcher, 97

skdaccess::framework::data_class::DataFetcher↔
Base, [119](#)
skdaccess::framework::data_class::DataFetcher↔
Cache, [124](#)
skdaccess::framework::data_class::DataFetcher↔
Local, [128](#)
skdaccess::framework::data_class::DataFetcher↔
Storage, [132](#)
skdaccess::framework::data_class::DataFetcher↔
Stream, [136](#)
skdaccess::geo::gldas::data_fetcher::DataFetcher,
[79](#)
skdaccess::geo::grace::data_fetcher::DataFetcher,
[84](#)
skdaccess::geo::groundwater::data_fetcher::Data↔
Fetcher, [90](#)
skdaccess::geo::modis::cache::data_fetcher::Data↔
Fetcher, [106](#)
skdaccess::geo::modis::stream::data_fetcher::↔
DataFetcher, [114](#)
skdaccess::geo::pbo::data_fetcher::DataFetcher, [73](#)

x_offset

skdaccess::utilities::modis_util::LatLon, [147](#)

y_offset

skdaccess::utilities::modis_util::LatLon, [147](#)