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 groundwater_example Namespace Reference 9

5.1.1 Variable Documentation 9

5.1.1.1 color 9

5.1.1.2 data_1 9

5.1.1.3 data_2 9

5.1.1.4 dataIt 10

5.1.1.5 fullDF 10

5.1.1.6 fullDW 10

5.1.1.7 label_1 10

5.1.1.8 label_2 10

5.1.1.9 meta_data . . . 10
5.2 skdaccess Namespace Reference . . . 10
5.3 skdaccess.astro Namespace Reference . . . 11
5.4 skdaccess.astro.kepler Namespace Reference . . . 11
5.5 skdaccess.astro.kepler.data_fetcher Namespace Reference . . . 11
5.6 skdaccess.bin Namespace Reference . . . 11
5.7 skdaccess.bin.skdaccess Namespace Reference . . . 11
5.7.1 Function Documentation . . . 11
5.7.1.1 skdaccess_script() . . . 11
5.8 skdaccess.framework Namespace Reference . . . 12
5.9 skdaccess.framework.data_class Namespace Reference . . . 12
5.10 skdaccess.framework.param_class Namespace Reference . . . 12
5.11 skdaccess.geo Namespace Reference . . . 12
5.12 skdaccess.geo.gldas Namespace Reference . . . 13
5.13 skdaccess.geo.gldas.data_fetcher Namespace Reference . . . 13
5.14 skdaccess.geo.grace Namespace Reference . . . 13
5.15 skdaccess.geo.grace.data_fetcher Namespace Reference . . . 13
5.16 skdaccess.geo.groundwater Namespace Reference . . . 13
5.17 skdaccess.geo.groundwater.data_fetcher Namespace Reference . . . 13
5.18 skdaccess.geo.mahali Namespace Reference . . . 14
5.19 skdaccess.geo.mahali.data_fetcher Namespace Reference . . . 14
5.20 skdaccess.geo.mahali.data_wrapper Namespace Reference . . . 14
5.21 skdaccess.geo.modis Namespace Reference . . . 14
5.22 skdaccess.geo.modis.cache Namespace Reference . . . 14
5.23 skdaccess.geo.modis.cache.cloud_mask Namespace Reference . . . 14
5.24 skdaccess.geo.modis.cache.cloud_mask.data_fetcher Namespace Reference . . . 15
5.25 skdaccess.geo.modis.cache.cloud_opacity Namespace Reference . . . 15
5.26 skdaccess.geo.modis.cache.cloud_opacity.data_fetcher Namespace Reference . . . 15

5.27 skdaccess.geo.modis.cache.data_fetcher Namespace Reference . . . 15
5.28 skdaccess.geo.modis.cache.reflectance Namespace Reference . . . 15
5.29 skdaccess.geo.modis.cache.reflectance.data_fetcher Namespace Reference . . . 15
5.30 skdaccess.geo.modis.stream Namespace Reference . . . 16
5.31 skdaccess.geo.modis.stream.cloud_mask Namespace Reference . . . 16
5.32 skdaccess.geo.modis.stream.cloud_mask.data_fetcher Namespace Reference . . . 16
5.33 skdaccess.geo.modis.stream.cloud_opacity Namespace Reference . . . 16
5.34 skdaccess.geo.modis.stream.cloud_opacity.data_fetcher Namespace Reference . . . 16
5.35 skdaccess.geo.modis.stream.data_fetcher Namespace Reference . . . 16
5.36 skdaccess.geo.modis.stream.reflectance Namespace Reference . . . 17
5.37 skdaccess.geo.modis.stream.reflectance.data_fetcher Namespace Reference . . . 17
5.38 skdaccess.geo.pbo Namespace Reference . . . 17
5.39 skdaccess.geo.pbo.data_fetcher Namespace Reference . . . 17
5.40 skdaccess.utilities Namespace Reference . . . 17
5.41 skdaccess.utilities.grace_util Namespace Reference . . . 17
5.41.1 Function Documentation . . . 18
5.41.1.1 average_dates() . . . 18
5.41.1.2 compute_ewd() . . . 18
5.41.1.3 dateMismatch() . . . 18
5.41.1.4 read_grace_data() . . . 19
5.42 skdaccess.utilities.gw_util Namespace Reference . . . 19
5.42.1 Function Documentation . . . 19
5.42.1.1 combine_water_heights() . . . 19
5.43 skdaccess.utilities.kepler_util Namespace Reference . . . 19
5.43.1 Function Documentation . . . 19
5.43.1.1 normalize() . . . 19
5.44 skdaccess.utilities.map_util Namespace Reference . . . 20
5.44.1 Function Documentation . . . 20

5.44.1.1 calc_slopes() . . . 20
5.44.1.2 global_coords() . . . 21
5.44.1.3 gps2pixel() . . . 21
5.44.1.4 sanitize_latlon() . . . 21
5.44.1.5 trim_map() . . . 22
5.44.1.6 wgs84_distance() . . . 22
5.45 skdaccess.utilities.modis_util Namespace Reference . . . 22
5.45.1 Function Documentation . . . 23
5.45.1.1 calibrateModis() . . . 23
5.45.1.2 checkBit() . . . 23
5.45.1.3 createGrid() . . . 23
5.45.1.4 getFileIDs() . . . 24
5.45.1.5 getFileURLs() . . . 24
5.45.1.6 getImageType() . . . 25
5.45.1.7 getModisData() . . . 25
5.45.1.8 gps2pixel() . . . 25
5.45.1.9 readMODISData() . . . 26
5.45.1.10 rescale() . . . 26
5.46 skdaccess.utilities.pbo_util Namespace Reference . . . 27
5.46.1 Function Documentation . . . 27
5.46.1.1 getLatLonRange() . . . 27
5.46.1.2 getROIstations() . . . 27
5.46.1.3 getStationCoords() . . . 28
5.46.1.4 nostab_sys() . . . 28
5.46.1.5 propagateErrors() . . . 28
5.46.1.6 removeAntennaOffset() . . . 28
5.46.1.7 stab_sys() . . . 29

6 Class Documentation **31**

6.1 skdaccess.framework.param_class.AutoList Class Reference 31

6.1.1 Detailed Description 31

6.1.2 Constructor & Destructor Documentation 31

6.1.2.1 __init__() 31

6.1.3 Member Function Documentation 32

6.1.3.1 __call__() 32

6.1.3.2 __getitem__() 32

6.1.3.3 __len__() 32

6.1.3.4 __setitem__() 33

6.1.3.5 __str__() 33

6.1.3.6 getAllOptions() 33

6.1.3.7 perturb() 33

6.1.3.8 reset() 34

6.1.3.9 val() 34

6.2 skdaccess.framework.param_class.AutoListCycle Class Reference 34

6.2.1 Detailed Description 35

6.2.2 Constructor & Destructor Documentation 35

6.2.2.1 __init__() 35

6.2.3 Member Function Documentation 35

6.2.3.1 __call__() 35

6.2.3.2 __getitem__() 35

6.2.3.3 __len__() 36

6.2.3.4 __setitem__() 36

6.2.3.5 __str__() 36

6.2.3.6 getAllOptions() 36

6.2.3.7 perturb() 37

6.2.3.8 reset() 37

6.2.3.9 val() . . . 37
6.3 skdaccess.framework.param_class.AutoListPermute Class Reference . . . 37
6.3.1 Detailed Description . . . 38
6.3.2 Member Function Documentation . . . 38
6.3.2.1 __call__() . . . 38
6.3.2.2 __getitem__() . . . 38
6.3.2.3 __len__() . . . 39
6.3.2.4 __setitem__() . . . 39
6.3.2.5 __str__() . . . 39
6.3.2.6 getAllOptions() . . . 39
6.3.2.7 perturb() . . . 40
6.3.2.8 reset() . . . 40
6.3.2.9 val() . . . 40
6.4 skdaccess.framework.param_class.AutoListRemove Class Reference . . . 40
6.4.1 Detailed Description . . . 41
6.4.2 Constructor & Destructor Documentation . . . 41
6.4.2.1 __init__() . . . 41
6.4.3 Member Function Documentation . . . 41
6.4.3.1 __call__() . . . 41
6.4.3.2 __getitem__() . . . 42
6.4.3.3 __len__() . . . 42
6.4.3.4 __setitem__() . . . 42
6.4.3.5 __str__() . . . 42
6.4.3.6 getAllOptions() . . . 43
6.4.3.7 perturb() . . . 43
6.4.3.8 reset() . . . 43
6.4.3.9 val() . . . 43
6.5 skdaccess.framework.param_class.AutoListSubset Class Reference . . . 44

6.5.1 Detailed Description . . . 44
6.5.2 Member Function Documentation . . . 44
6.5.2.1 __call__() . . . 44
6.5.2.2 __getitem__() . . . 44
6.5.2.3 __len__() . . . 45
6.5.2.4 __setitem__() . . . 45
6.5.2.5 __str__() . . . 45
6.5.2.6 getAllOptions() . . . 46
6.5.2.7 perturb() . . . 46
6.5.2.8 reset() . . . 46
6.5.2.9 val() . . . 46
6.6 skdaccess.framework.param_class.AutoParam Class Reference . . . 46
6.6.1 Detailed Description . . . 47
6.6.2 Constructor & Destructor Documentation . . . 47
6.6.2.1 __init__() . . . 47
6.6.3 Member Function Documentation . . . 47
6.6.3.1 __call__() . . . 47
6.6.3.2 __str__() . . . 48
6.6.3.3 perturb() . . . 48
6.6.3.4 reset() . . . 48
6.7 skdaccess.framework.param_class.AutoParamList Class Reference . . . 48
6.7.1 Detailed Description . . . 49
6.7.2 Constructor & Destructor Documentation . . . 49
6.7.2.1 __init__() . . . 49
6.7.3 Member Function Documentation . . . 49
6.7.3.1 __call__() . . . 49
6.7.3.2 __str__() . . . 50
6.7.3.3 perturb() . . . 50

6.7.3.4 reset() . . . 50
6.8 skdaccess.framework.param_class.AutoParamListCycle Class Reference . . . 50
6.8.1 Detailed Description . . . 51
6.8.2 Constructor & Destructor Documentation . . . 51
6.8.2.1 __init__() . . . 51
6.8.3 Member Function Documentation . . . 51
6.8.3.1 __call__() . . . 51
6.8.3.2 __str__() . . . 51
6.8.3.3 perturb() . . . 52
6.8.3.4 reset() . . . 52
6.9 skdaccess.framework.param_class.AutoParamMinMax Class Reference . . . 52
6.9.1 Detailed Description . . . 52
6.9.2 Constructor & Destructor Documentation . . . 53
6.9.2.1 __init__() . . . 53
6.9.3 Member Function Documentation . . . 53
6.9.3.1 __call__() . . . 53
6.9.3.2 __str__() . . . 53
6.9.3.3 perturb() . . . 54
6.9.3.4 reset() . . . 54
6.10 skdaccess.geo.modis.stream.DataFetcher Class Reference . . . 54
6.10.1 Detailed Description . . . 55
6.10.2 Constructor & Destructor Documentation . . . 55
6.10.2.1 __init__() . . . 55
6.10.3 Member Function Documentation . . . 55
6.10.3.1 __str__() . . . 55
6.10.3.2 getConfig() . . . 56
6.10.3.3 getMetadata() . . . 56
6.10.3.4 multirun_enabled() . . . 56

6.10.3.5 output() . . . 56
6.10.3.6 perturb() . . . 57
6.10.3.7 reset() . . . 57
6.10.3.8 retrieveOnlineData() . . . 57
6.10.3.9 writeConfig() . . . 57
6.11 skdaccess.geo.modis.stream.reflectance.DataFetcher Class Reference . . . 58
6.11.1 Detailed Description . . . 58
6.11.2 Constructor & Destructor Documentation . . . 58
6.11.2.1 __init__() . . . 58
6.12 skdaccess.geo.pbo.DataFetcher Class Reference . . . 59
6.12.1 Detailed Description . . . 59
6.12.2 Constructor & Destructor Documentation . . . 60
6.12.2.1 __init__() . . . 60
6.12.3 Member Function Documentation . . . 60
6.12.3.1 __str__() . . . 60
6.12.3.2 downloadFullDataset() . . . 60
6.12.3.3 getAntennaLogs() . . . 61
6.12.3.4 getConfig() . . . 61
6.12.3.5 getDataLocation() . . . 61
6.12.3.6 getInfo() . . . 62
6.12.3.7 getMetadata() . . . 62
6.12.3.8 getStationMetadata() . . . 62
6.12.3.9 multirun_enabled() . . . 62
6.12.3.10 output() . . . 63
6.12.3.11 perturb() . . . 63
6.12.3.12 reset() . . . 63
6.12.3.13 setDataLocation() . . . 63
6.12.3.14 setStationList() . . . 63

6.12.3.15 writeConfig() . . . 64
6.13 skdaccess.geo.modis.cache.cloud_opacity.DataFetcher Class Reference . . . 64
6.13.1 Detailed Description . . . 64
6.13.2 Constructor & Destructor Documentation . . . 65
6.13.2.1 __init__() . . . 65
6.14 skdaccess.geo.gldas.DataFetcher Class Reference . . . 65
6.14.1 Detailed Description . . . 66
6.14.2 Constructor & Destructor Documentation . . . 66
6.14.2.1 __init__() . . . 66
6.14.3 Member Function Documentation . . . 66
6.14.3.1 __str__() . . . 66
6.14.3.2 downloadFullDataset() . . . 67
6.14.3.3 getConfig() . . . 67
6.14.3.4 getDataLocation() . . . 67
6.14.3.5 getMetadata() . . . 68
6.14.3.6 multirun_enabled() . . . 68
6.14.3.7 output() . . . 68
6.14.3.8 perturb() . . . 68
6.14.3.9 reset() . . . 69
6.14.3.10 setDataLocation() . . . 69
6.14.3.11 writeConfig() . . . 69
6.15 skdaccess.geo.grace.DataFetcher Class Reference . . . 69
6.15.1 Detailed Description . . . 70
6.15.2 Constructor & Destructor Documentation . . . 70
6.15.2.1 __init__() . . . 70
6.15.3 Member Function Documentation . . . 71
6.15.3.1 __str__() . . . 71
6.15.3.2 downloadFullDataset() . . . 71

6.15.3.3 getConfig() . . . 71
6.15.3.4 getDataLocation() . . . 71
6.15.3.5 getMetadata() . . . 72
6.15.3.6 multirun_enabled() . . . 72
6.15.3.7 output() . . . 72
6.15.3.8 perturb() . . . 73
6.15.3.9 reset() . . . 73
6.15.3.10 setDataLocation() . . . 73
6.15.3.11 writeConfig() . . . 73
6.16 skdaccess.geo.groundwater.DataFetcher Class Reference . . . 74
6.16.1 Detailed Description . . . 74
6.16.2 Constructor & Destructor Documentation . . . 74
6.16.2.1 __init__() . . . 74
6.16.3 Member Function Documentation . . . 75
6.16.3.1 __str__() . . . 75
6.16.3.2 downloadFullDataset() . . . 75
6.16.3.3 getConfig() . . . 75
6.16.3.4 getDataLocation() . . . 76
6.16.3.5 getMetadata() . . . 76
6.16.3.6 getStationMetadata() . . . 76
6.16.3.7 multirun_enabled() . . . 77
6.16.3.8 output() . . . 77
6.16.3.9 perturb() . . . 77
6.16.3.10 reset() . . . 77
6.16.3.11 setDataLocation() . . . 77
6.16.3.12 writeConfig() . . . 78
6.17 skdaccess.geo.modis.stream.cloud_opacity.DataFetcher Class Reference . . . 78
6.17.1 Detailed Description . . . 78

6.17.2 Constructor & Destructor Documentation . . . 79
6.17.2.1 __init__() . . . 79
6.18 skdaccess.astro.kepler.DataFetcher Class Reference . . . 79
6.18.1 Detailed Description . . . 80
6.18.2 Constructor & Destructor Documentation . . . 80
6.18.2.1 __init__() . . . 80
6.18.3 Member Function Documentation . . . 80
6.18.3.1 __str__() . . . 80
6.18.3.2 cacheData() . . . 81
6.18.3.3 downloadKeplerData() . . . 81
6.18.3.4 getConfig() . . . 81
6.18.3.5 getDataLocation() . . . 81
6.18.3.6 getMetadata() . . . 82
6.18.3.7 multirun_enabled() . . . 82
6.18.3.8 output() . . . 82
6.18.3.9 perturb() . . . 83
6.18.3.10 reset() . . . 83
6.18.3.11 setDataLocation() . . . 83
6.18.3.12 writeConfig() . . . 83
6.19 skdaccess.geo.mahali.DataFetcher Class Reference . . . 84
6.19.1 Detailed Description . . . 84
6.19.2 Constructor & Destructor Documentation . . . 84
6.19.2.1 __init__() . . . 84
6.19.3 Member Function Documentation . . . 85
6.19.3.1 __str__() . . . 85
6.19.3.2 cacheData() [1/2] . . . 85
6.19.3.3 cacheData() [2/2] . . . 85
6.19.3.4 getConfig() . . . 85

6.19.3.5 getDataLocation() . . . 86
6.19.3.6 getMetadata() . . . 86
6.19.3.7 multirun_enabled() . . . 86
6.19.3.8 output() . . . 87
6.19.3.9 perturb() . . . 87
6.19.3.10 reset() . . . 87
6.19.3.11 setDataLocation() . . . 87
6.19.3.12 writeConfig() . . . 87
6.20 skdaccess.geo.modis.cache.cloud_mask.DataFetcher Class Reference . . . 88
6.20.1 Detailed Description . . . 88
6.20.2 Constructor & Destructor Documentation . . . 88
6.20.2.1 __init__() . . . 88
6.21 skdaccess.geo.modis.cache.DataFetcher Class Reference . . . 89
6.21.1 Detailed Description . . . 90
6.21.2 Constructor & Destructor Documentation . . . 90
6.21.2.1 __init__() . . . 90
6.21.3 Member Function Documentation . . . 90
6.21.3.1 __str__() . . . 90
6.21.3.2 cacheData() . . . 91
6.21.3.3 find_data() . . . 91
6.21.3.4 getConfig() . . . 91
6.21.3.5 getDataLocation() . . . 91
6.21.3.6 getMetadata() . . . 92
6.21.3.7 multirun_enabled() . . . 92
6.21.3.8 output() . . . 92
6.21.3.9 perturb() . . . 93
6.21.3.10 reset() . . . 93
6.21.3.11 setDataLocation() . . . 93

6.21.3.12 writeConfig() . . . 93
6.22 skdaccess.geo.modis.cache.reflectance.DataFetcher Class Reference . . . 94
6.22.1 Detailed Description . . . 94
6.22.2 Constructor & Destructor Documentation . . . 94
6.22.2.1 __init__() . . . 94
6.23 skdaccess.geo.modis.stream.cloud_mask.DataFetcher Class Reference . . . 95
6.23.1 Detailed Description . . . 95
6.23.2 Constructor & Destructor Documentation . . . 95
6.23.2.1 __init__() . . . 95
6.24 skdaccess.framework.data_class.DataFetcherBase Class Reference . . . 96
6.24.1 Detailed Description . . . 96
6.24.2 Constructor & Destructor Documentation . . . 96
6.24.2.1 __init__() . . . 96
6.24.3 Member Function Documentation . . . 97
6.24.3.1 __str__() . . . 97
6.24.3.2 getConfig() . . . 97
6.24.3.3 getMetadata() . . . 97
6.24.3.4 multirun_enabled() . . . 97
6.24.3.5 output() . . . 98
6.24.3.6 perturb() . . . 98
6.24.3.7 reset() . . . 98
6.24.3.8 writeConfig() . . . 98
6.25 skdaccess.framework.data_class.DataFetcherCache Class Reference . . . 98
6.25.1 Detailed Description . . . 99
6.25.2 Member Function Documentation . . . 99
6.25.2.1 __str__() . . . 99
6.25.2.2 cacheData() . . . 99
6.25.2.3 getConfig() . . . 100

6.25.2.4 getDataLocation() . . . 100
6.25.2.5 getMetadata() . . . 100
6.25.2.6 multirun_enabled() . . . 101
6.25.2.7 output() . . . 101
6.25.2.8 perturb() . . . 101
6.25.2.9 reset() . . . 101
6.25.2.10 setDataLocation() . . . 101
6.25.2.11 writeConfig() . . . 102
6.26 skdaccess.framework.data_class.DataFetcherLocal Class Reference . . . 102
6.26.1 Member Function Documentation . . . 103
6.26.1.1 __str__() . . . 103
6.26.1.2 getConfig() . . . 103
6.26.1.3 getDataLocation() . . . 103
6.26.1.4 getMetadata() . . . 103
6.26.1.5 multirun_enabled() . . . 104
6.26.1.6 output() . . . 104
6.26.1.7 perturb() . . . 104
6.26.1.8 reset() . . . 104
6.26.1.9 setDataLocation() . . . 104
6.26.1.10 writeConfig() . . . 105
6.27 skdaccess.framework.data_class.DataFetcherStorage Class Reference . . . 105
6.27.1 Detailed Description . . . 106
6.27.2 Member Function Documentation . . . 106
6.27.2.1 __str__() . . . 106
6.27.2.2 downloadFullDataset() . . . 106
6.27.2.3 getConfig() . . . 106
6.27.2.4 getDataLocation() . . . 106
6.27.2.5 getMetadata() . . . 107

6.27.2.6 multirun_enabled() . . . 107
6.27.2.7 output() . . . 107
6.27.2.8 perturb() . . . 108
6.27.2.9 reset() . . . 108
6.27.2.10 setDataLocation() . . . 108
6.27.2.11 writeConfig() . . . 108
6.28 skdaccess.framework.data_class.DataFetcherStream Class Reference . . . 109
6.28.1 Detailed Description . . . 109
6.28.2 Member Function Documentation . . . 109
6.28.2.1 __str__() . . . 109
6.28.2.2 getConfig() . . . 109
6.28.2.3 getMetadata() . . . 110
6.28.2.4 multirun_enabled() . . . 110
6.28.2.5 output() . . . 110
6.28.2.6 perturb() . . . 110
6.28.2.7 reset() . . . 110
6.28.2.8 retrieveOnlineData() . . . 110
6.28.2.9 writeConfig() . . . 111
6.29 skdaccess.geo.mahali.data_wrapper.DataWrapper Class Reference . . . 111
6.29.1 Detailed Description . . . 112
6.29.2 Member Function Documentation . . . 112
6.29.2.1 addResult() . . . 112
6.29.2.2 get() . . . 112
6.29.2.3 getIterator() . . . 112
6.29.2.4 getResults() . . . 113
6.29.2.5 info() . . . 113
6.29.2.6 reset() . . . 113
6.29.2.7 update() . . . 113

6.30 skdaccess.framework.data_class.DataWrapperBase Class Reference . . . 114
6.30.1 Detailed Description . . . 114
6.30.2 Constructor & Destructor Documentation . . . 114
6.30.2.1 __init__() . . . 114
6.30.3 Member Function Documentation . . . 115
6.30.3.1 addResult() . . . 115
6.30.3.2 get() . . . 115
6.30.3.3 getIterator() . . . 115
6.30.3.4 getResults() . . . 115
6.30.3.5 info() . . . 116
6.30.3.6 reset() . . . 116
6.30.3.7 update() . . . 116
6.31 skdaccess.framework.data_class.ImageWrapper Class Reference . . . 116
6.31.1 Detailed Description . . . 117
6.31.2 Member Function Documentation . . . 117
6.31.2.1 addResult() . . . 117
6.31.2.2 deleteData() . . . 117
6.31.2.3 get() . . . 118
6.31.2.4 getIterator() . . . 118
6.31.2.5 getResults() . . . 118
6.31.2.6 info() . . . 118
6.31.2.7 reset() . . . 119
6.31.2.8 update() . . . 119
6.31.2.9 updateData() . . . 119
6.32 skdaccess.utilities.modis_util.LatLon Class Reference . . . 119
6.32.1 Detailed Description . . . 120
6.32.2 Constructor & Destructor Documentation . . . 120
6.32.2.1 __init__() . . . 120

6.32.3 Member Function Documentation . . . 120
6.32.3.1 __call__() . . . 120
6.33 skdaccess.utilities.map_util.Planet Class Reference . . . 121
6.33.1 Detailed Description . . . 121
6.33.2 Constructor & Destructor Documentation . . . 121
6.33.2.1 __init__() . . . 121
6.33.3 Member Function Documentation . . . 122
6.33.3.1 get_lateraldist() . . . 122
6.33.3.2 get_lateraldist_array() . . . 122
6.33.3.3 get_medialdist() . . . 122
6.34 skdaccess.framework.data_class.SeriesDictionaryWrapper Class Reference . . . 123
6.34.1 Detailed Description . . . 123
6.34.2 Member Function Documentation . . . 123
6.34.2.1 addResult() . . . 123
6.34.2.2 get() . . . 124
6.34.2.3 getIndices() . . . 124
6.34.2.4 getIterator() . . . 124
6.34.2.5 getLength() . . . 124
6.34.2.6 getResults() . . . 125
6.34.2.7 info() . . . 125
6.34.2.8 reset() . . . 125
6.34.2.9 update() . . . 125
6.35 skdaccess.framework.data_class.SeriesWrapper Class Reference . . . 126
6.35.1 Detailed Description . . . 126
6.35.2 Constructor & Destructor Documentation . . . 126
6.35.2.1 __init__() . . . 126
6.35.3 Member Function Documentation . . . 127
6.35.3.1 addResult() . . . 127

6.35.3.2 get() . . . 127
6.35.3.3 getIndices() . . . 127
6.35.3.4 getIterator() . . . 128
6.35.3.5 getLength() . . . 128
6.35.3.6 getResults() . . . 128
6.35.3.7 info() . . . 128
6.35.3.8 reset() . . . 129
6.35.3.9 update() . . . 129
6.36 skdaccess.framework.data_class.TableWrapper Class Reference . . . 129
6.36.1 Detailed Description . . . 130
6.36.2 Constructor & Destructor Documentation . . . 130
6.36.2.1 __init__() . . . 130
6.36.3 Member Function Documentation . . . 130
6.36.3.1 addColumn() . . . 130
6.36.3.2 addResult() . . . 131
6.36.3.3 get() . . . 131
6.36.3.4 getDefaultColumns() . . . 131
6.36.3.5 getDefaultErrorColumns() . . . 132
6.36.3.6 getIterator() . . . 132
6.36.3.7 getLength() . . . 132
6.36.3.8 getResults() . . . 132
6.36.3.9 info() . . . 133
6.36.3.10 removeFrames() . . . 133
6.36.3.11 reset() . . . 133
6.36.3.12 update() . . . 133
6.36.3.13 updateData() . . . 134
6.36.3.14 updateFrames() . . . 134

7 File Documentation 135

7.1 astro/kepler/data_fetcher.py File Reference . . . 135

7.2 geo/gldas/data_fetcher.py File Reference . . . 135

7.3 geo/grace/data_fetcher.py File Reference . . . 135

7.4 geo/groundwater/data_fetcher.py File Reference . . . 136

7.5 geo/mahali/data_fetcher.py File Reference . . . 136

7.6 geo/modis/cache/cloud_mask/data_fetcher.py File Reference . . . 136

7.7 geo/modis/cache/cloud_opacity/data_fetcher.py File Reference . . . 136

7.8 geo/modis/cache/data_fetcher.py File Reference . . . 137

7.9 geo/modis/cache/reflectance/data_fetcher.py File Reference . . . 137

7.10 geo/modis/stream/cloud_mask/data_fetcher.py File Reference . . . 137

7.11 geo/modis/stream/cloud_opacity/data_fetcher.py File Reference . . . 137

7.12 geo/modis/stream/data_fetcher.py File Reference . . . 138

7.13 geo/modis/stream/reflectance/data_fetcher.py File Reference . . . 138

7.14 geo/pbo/data_fetcher.py File Reference . . . 138

7.15 bin/skdaccess.py File Reference . . . 138

7.16 examples/groundwater_example.py File Reference . . . 139

7.17 framework/data_class.py File Reference . . . 139

7.18 framework/param_class.py File Reference . . . 140

7.19 geo/mahali/data_wrapper.py File Reference . . . 140

7.20 utilities/grace_util.py File Reference . . . 140

7.21 utilities/gw_util.py File Reference . . . 141

7.22 utilities/kepler_util.py File Reference . . . 141

7.23 utilities/map_util.py File Reference . . . 141

7.24 utilities/modis_util.py File Reference . . . 142

7.25 utilities/pbo_util.py File Reference . . . 142

Index 143

Chapter 1

Namespace Index

1.1 Packages

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

groundwater_example . . . 9
skdaccess . . . 10
skdaccess.astro . . . 11
skdaccess.astro.kepler . . . 11
skdaccess.astro.kepler.data_fetcher . . . 11
skdaccess.bin . . . 11
skdaccess.bin.skdaccess . . . 11
skdaccess.framework . . . 12
skdaccess.framework.data_class . . . 12
skdaccess.framework.param_class . . . 12
skdaccess.geo . . . 12
skdaccess.geo.gldas . . . 13
skdaccess.geo.gldas.data_fetcher . . . 13
skdaccess.geo.grace . . . 13
skdaccess.geo.grace.data_fetcher . . . 13
skdaccess.geo.groundwater . . . 13
skdaccess.geo.groundwater.data_fetcher . . . 13
skdaccess.geo.mahali . . . 14
skdaccess.geo.mahali.data_fetcher . . . 14
skdaccess.geo.mahali.data_wrapper . . . 14
skdaccess.geo.modis . . . 14
skdaccess.geo.modis.cache . . . 14
skdaccess.geo.modis.cache.cloud_mask . . . 14
skdaccess.geo.modis.cache.cloud_mask.data_fetcher . . . 15
skdaccess.geo.modis.cache.cloud_opacity . . . 15
skdaccess.geo.modis.cache.cloud_opacity.data_fetcher . . . 15
skdaccess.geo.modis.cache.data_fetcher . . . 15
skdaccess.geo.modis.cache.reflectance . . . 15
skdaccess.geo.modis.cache.reflectance.data_fetcher . . . 15
skdaccess.geo.modis.stream . . . 16
skdaccess.geo.modis.stream.cloud_mask . . . 16

skdaccess.geo.modis.stream.cloud_mask.data_fetcher . . . 16
skdaccess.geo.modis.stream.cloud_opacity . . . 16
skdaccess.geo.modis.stream.cloud_opacity.data_fetcher . . . 16
skdaccess.geo.modis.stream.data_fetcher . . . 16
skdaccess.geo.modis.stream.reflectance . . . 17
skdaccess.geo.modis.stream.reflectance.data_fetcher . . . 17
skdaccess.geo.pbo . . . 17
skdaccess.geo.pbo.data_fetcher . . . 17
skdaccess.utilities . . . 17
skdaccess.utilities.grace_util . . . 17
skdaccess.utilities.gw_util . . . 19
skdaccess.utilities.kepler_util . . . 19
skdaccess.utilities.map_util . . . 20
skdaccess.utilities.modis_util . . . 22
skdaccess.utilities.pbo_util . . . 27

Chapter 2

Hierarchical Index

2.1 Class Hierarchy

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

skdaccess.framework.param_class.AutoParam . . . 46
skdaccess.framework.param_class.AutoParamList . . . 48
skdaccess.framework.param_class.AutoParamListCycle . . . 50
skdaccess.framework.param_class.AutoParamMinMax . . . 52
MDF
skdaccess.geo.modis.cache.cloud_mask.DataFetcher . . . 88
skdaccess.geo.modis.cache.cloud_opacity.DataFetcher . . . 64
skdaccess.geo.modis.cache.reflectance.DataFetcher . . . 94
skdaccess.geo.modis.stream.cloud_mask.DataFetcher . . . 95
skdaccess.geo.modis.stream.cloud_opacity.DataFetcher . . . 78
skdaccess.geo.modis.stream.reflectance.DataFetcher . . . 58
object
skdaccess.framework.data_class.DataFetcherBase . . . 96
skdaccess.framework.data_class.DataFetcherLocal . . . 102
skdaccess.framework.data_class.DataFetcherCache . . . 98
skdaccess.astro.kepler.DataFetcher . . . 79
skdaccess.geo.mahali.DataFetcher . . . 84
skdaccess.geo.modis.cache.DataFetcher . . . 89
skdaccess.framework.data_class.DataFetcherStorage . . . 105
skdaccess.geo.gldas.DataFetcher . . . 65
skdaccess.geo.grace.DataFetcher . . . 69
skdaccess.geo.groundwater.DataFetcher . . . 74
skdaccess.geo.pbo.DataFetcher . . . 59
skdaccess.framework.data_class.DataFetcherStream . . . 109
skdaccess.geo.modis.stream.DataFetcher . . . 54
skdaccess.framework.data_class.DataWrapperBase . . . 114
skdaccess.framework.data_class.ImageWrapper . . . 116
skdaccess.framework.data_class.SeriesWrapper . . . 126
skdaccess.framework.data_class.SeriesDictionaryWrapper . . . 123
skdaccess.framework.data_class.TableWrapper . . . 129

skdaccess.geo.mahali.data_wrapper.DataWrapper 111
skdaccess.framework.param_class.AutoList 31
skdaccess.framework.param_class.AutoListCycle 34
skdaccess.framework.param_class.AutoListPermute 37
skdaccess.framework.param_class.AutoListRemove 40
skdaccess.framework.param_class.AutoListSubset 44
skdaccess.utilities.modis_util.LatLon 119
skdaccess.utilities.map_util.Planet 121

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 . . . 34

skdaccess.framework.param_class.AutoListPermute
: A perturber that permutes a list . . . 37

skdaccess.framework.param_class.AutoListRemove
: Removes a different single element from the initial list at each perturb call . . . 40

skdaccess.framework.param_class.AutoListSubset
: An AutoList perturber that creates random subsets of a list . . . 44

skdaccess.framework.param_class.AutoParam
: Defines a tunable parameter class inherited by specific subclasses . . . 46

skdaccess.framework.param_class.AutoParamList
: A tunable parameter with a specified list of choices that can be randomly selected via perturb . . . 48

skdaccess.framework.param_class.AutoParamListCycle
: Cycles through a list of paramters . . . 50

skdaccess.framework.param_class.AutoParamMinMax
: A tunable parameter with min and max ranges, perturbs to a random value in range . . . 52

skdaccess.geo.modis.stream.DataFetcher
: Data Fetcher for MODIS data . . . 54

skdaccess.geo.modis.stream.reflectance.DataFetcher
: Data fetcher for the modis surface reflectance product ('09', 1 km resolution) . . . 58

skdaccess.geo.pbo.DataFetcher
: Data fetcher for PBO GPS data . . . 59

skdaccess.geo.modis.cache.cloud_opacity.DataFetcher
: Data Fetcher for MODIS Cloud Opacity . . . 64

skdaccess.geo.gldas.DataFetcher
: Data Fetcher for GLDAS data . . . 65

skdaccess.geo.grace.DataFetcher
: Data Fetcher for GRACE data . . . 69

skdaccess.geo.groundwater.DataFetcher
: Generates Data Wrappers of groundwater measurements taken in the US . . . 74

skdaccess.geo.modis.stream.cloud_opacity.DataFetcher
Data Fetcher for MODIS Cloud Opacity . . . 78
skdaccess.astro.kepler.DataFetcher
Data Fetcher for Kepler light curve data . . . 79
skdaccess.geo.mahali.DataFetcher
Data Fetcher for Mahali Data . . . 84
skdaccess.geo.modis.cache.cloud_mask.DataFetcher
Data Fetcher for MODIS Cloud Mask . . . 88
skdaccess.geo.modis.cache.DataFetcher
Data Fetcher for MODIS data . . . 89
skdaccess.geo.modis.cache.reflectance.DataFetcher
Data fetcher for the modis surface reflectance product ('09', 1 km resolution) . . . 94
skdaccess.geo.modis.stream.cloud_mask.DataFetcher
Data Fetcher for MODIS Cloud Mask . . . 95
skdaccess.framework.data_class.DataFetcherBase
Base class for all data fetchers . . . 96
skdaccess.framework.data_class.DataFetcherCache
Data fetcher base class for downloading data and caching results on hard disk . . . 98
skdaccess.framework.data_class.DataFetcherLocal . . . 102
skdaccess.framework.data_class.DataFetcherStorage
Data fetcher base class for use when entire data set is downloaded . . . 105
skdaccess.framework.data_class.DataFetcherStream
Data fetcher base class for downloading data into memory . . . 109
skdaccess.geo.mahali.data_wrapper.DataWrapper
Data wrapper for Mahali data . . . 111
skdaccess.framework.data_class.DataWrapperBase
Base class for wrapping data for use in DiscoveryPipeline . . . 114
skdaccess.framework.data_class.ImageWrapper
Wrapper for image data . . . 116
skdaccess.utilities.modis_util.LatLon
Calculates Lat/Lon position from y,x pixel coordinate . . . 119
skdaccess.utilities.map_util.Planet
A class for storing variables about a planetary body . . . 121
skdaccess.framework.data_class.SeriesDictionaryWrapper
Data wrapper for series data using a dictionary of data frames . . . 123
skdaccess.framework.data_class.SeriesWrapper
Data wrapper for series data using a data panel . . . 126
skdaccess.framework.data_class.TableWrapper
Data wrapper for table data using an ordered dictionary . . . 129

Chapter 4

File Index

4.1 File List

Here is a list of all files with brief descriptions:

astro/kepler/data_fetcher.py . . . 135
bin/skdaccess.py . . . 138
examples/groundwater_example.py . . . 139
framework/data_class.py . . . 139
framework/param_class.py . . . 140
geo/gldas/data_fetcher.py . . . 135
geo/grace/data_fetcher.py . . . 135
geo/groundwater/data_fetcher.py . . . 136
geo/mahali/data_fetcher.py . . . 136
geo/mahali/data_wrapper.py . . . 140
geo/modis/cache/data_fetcher.py . . . 137
geo/modis/cache/cloud_mask/data_fetcher.py . . . 136
geo/modis/cache/cloud_opacity/data_fetcher.py . . . 136
geo/modis/cache/reflectance/data_fetcher.py . . . 137
geo/modis/stream/data_fetcher.py . . . 138
geo/modis/stream/cloud_mask/data_fetcher.py . . . 137
geo/modis/stream/cloud_opacity/data_fetcher.py . . . 137
geo/modis/stream/reflectance/data_fetcher.py . . . 138
geo/pbo/data_fetcher.py . . . 138
utilities/grace_util.py . . . 140
utilities/gw_util.py . . . 141
utilities/kepler_util.py . . . 141
utilities/map_util.py . . . 141
utilities/modis_util.py . . . 142
utilities/pbo_util.py . . . 142

Chapter 5

Namespace Documentation

5.1 groundwater_example Namespace Reference

Variables

- fullDF
- fullDW = fullDF.output()
- meta_data = WDF.getStationMetadata()
- dataIt = fullDW.getIterator()
- label_1
- data_1
- label_2
- data_2
- color

5.1.1 Variable Documentation

5.1.1.1 color

```
groundwater_example.color
```

5.1.1.2 data_1

```
groundwater_example.data_1
```

5.1.1.3 data_2

```
groundwater_example.data_2
```

5.1.1.4 dataIt

```
groundwater_example.dataIt = fullDW.getIterator()
```

5.1.1.5 fullDF

```
groundwater_example.fullDF
```

Initial value:

```
1 =  WDF([AutoParam(35), AutoParam(38), AutoParam(-119), AutoParam(-118)],
2              '2007-01-01','2016-12-31',cutoff=0.0)
```

5.1.1.6 fullDW

```
groundwater_example.fullDW = fullDF.output()
```

5.1.1.7 label_1

```
groundwater_example.label_1
```

5.1.1.8 label_2

```
groundwater_example.label_2
```

5.1.1.9 meta_data

```
groundwater_example.meta_data = WDF.getStationMetadata()
```

5.2 skdaccess Namespace Reference

Namespaces

- astro
- bin
- framework
- geo
- utilities

5.3 skdaccess.astro Namespace Reference

Namespaces

- kepler

5.4 skdaccess.astro.kepler Namespace Reference

Namespaces

- data_fetcher

5.5 skdaccess.astro.kepler.data_fetcher Namespace Reference

Classes

- class DataFetcher

5.6 skdaccess.bin Namespace Reference

Namespaces

- skdaccess

5.7 skdaccess.bin.skdaccess Namespace Reference

Functions

- def skdaccess_script ()

5.7.1 Function Documentation

5.7.1.1 skdaccess_script()

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

5.8 skdaccess.framework Namespace Reference

Namespaces

- data_class
- param_class

5.9 skdaccess.framework.data_class Namespace Reference

Classes

- class DataFetcherBase
- class DataFetcherCache
- class DataFetcherLocal
- class DataFetcherStorage
- class DataFetcherStream
- class DataWrapperBase
- class ImageWrapper
- class SeriesDictionaryWrapper
- class SeriesWrapper
- class TableWrapper

5.10 skdaccess.framework.param_class Namespace Reference

Classes

- class AutoList
- class AutoListCycle
- class AutoListPermute
- class AutoListRemove
- class AutoListSubset
- class AutoParam
- class AutoParamList
- class AutoParamListCycle
- class AutoParamMinMax

5.11 skdaccess.geo Namespace Reference

Namespaces

- gldas
- grace
- groundwater
- mahali
- modis
- pbo

5.12 skdaccess.geo.gldas Namespace Reference

Namespaces

- data_fetcher

5.13 skdaccess.geo.gldas.data_fetcher Namespace Reference

Classes

- class DataFetcher

5.14 skdaccess.geo.grace Namespace Reference

Namespaces

- data_fetcher

5.15 skdaccess.geo.grace.data_fetcher Namespace Reference

Classes

- class DataFetcher

5.16 skdaccess.geo.groundwater Namespace Reference

Namespaces

- data_fetcher

5.17 skdaccess.geo.groundwater.data_fetcher Namespace Reference

Classes

- class DataFetcher

5.18 skdaccess.geo.mahali Namespace Reference

Namespaces

- data_fetcher
- data_wrapper

5.19 skdaccess.geo.mahali.data_fetcher Namespace Reference

Classes

- class DataFetcher

5.20 skdaccess.geo.mahali.data_wrapper Namespace Reference

Classes

- class DataWrapper

5.21 skdaccess.geo.modis Namespace Reference

Namespaces

- cache
- stream

5.22 skdaccess.geo.modis.cache Namespace Reference

Namespaces

- cloud_mask
- cloud_opacity
- data_fetcher
- reflectance

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

Namespaces

- data_fetcher

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

Classes

- class DataFetcher

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

Namespaces

- data_fetcher

5.26 skdaccess.geo.modis.cache.cloud_opacity.data_fetcher Namespace Reference

Classes

- class DataFetcher

5.27 skdaccess.geo.modis.cache.data_fetcher Namespace Reference

Classes

- class DataFetcher

5.28 skdaccess.geo.modis.cache.reflectance Namespace Reference

Namespaces

- data_fetcher

5.29 skdaccess.geo.modis.cache.reflectance.data_fetcher Namespace Reference

Classes

- class DataFetcher

5.30 skdaccess.geo.modis.stream Namespace Reference

Namespaces

- cloud_mask
- cloud_opacity
- data_fetcher
- reflectance

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

Namespaces

- data_fetcher

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

Classes

- class DataFetcher

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

Namespaces

- data_fetcher

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

Classes

- class DataFetcher

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

Classes

- class DataFetcher

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

Namespaces

- data_fetcher

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

Classes

- class DataFetcher

5.38 skdaccess.geo.pbo Namespace Reference

Namespaces

- data_fetcher

5.39 skdaccess.geo.pbo.data_fetcher Namespace Reference

Classes

- class DataFetcher

5.40 skdaccess.utilities Namespace Reference

Namespaces

- grace_util
- gw_util
- kepler_util
- map_util
- modis_util
- pbo_util

5.41 skdaccess.utilities.grace_util Namespace Reference

Functions

- def average_dates (dates, round_nearest_day=False)
- def dateMismatch (dates, days=10)
- def compute_ewd (grace_data, scale_factor, round_nearest_day=False)
- def read_grace_data (filename, lat_name, lon_name, data_name, time=None)

5.41.1 Function Documentation

5.41.1.1 average_dates()

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

Compute the average of a pandas series of timestamps.

Parameters

dates	List of pandas datetime objects
round_nearest_day	Round to the nearest day

Returns

Average of dates

5.41.1.2 compute_ewd()

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

5.41.1.3 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

dates	Iterable container of pandas timestamps
days	Number of days

Returns

true if they are not with 10 days, false otherwise

5.41.1.4 read_grace_data()

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

This function reads in netcdf data provided by GRACE Tellus.

Parameters

filename	Name of file to read in
lat_name	Name of latitude data
lon_name	Name of longitude data
data_name	Name of data product
time	Name of time data

5.42 skdaccess.utilities.gw_util Namespace Reference

Functions

- def combine_water_heights (in_data)

5.42.1 Function Documentation

5.42.1.1 combine_water_heights()

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

5.43 skdaccess.utilities.kepler_util Namespace Reference

Functions

- def normalize (in_data, column='PDCSAP_FLUX', group_column='QUARTER')

5.43.1 Function Documentation

5.43.1.1 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

in_data	Data to be normalized
column	Name of column to be normalized
group_column	Name of column used to group data

5.44 skdaccess.utilities.map_util Namespace Reference

Classes

- class Planet

Functions

- def sanitize_latlon (lat_lon_tuple, ppd=1, start_from_90N=False)
- def trim_map (array, ppd, nswe, lat_npole=90, lon_offset=0)
- def calc_slopes (topo_array, ppd, planet, scaled=True, nswe="global", lon_offset=0, lat_npole=90)
- def wgs84_distance (point1, point2, planet=Planet("wgs84"), miles=False)
- def global_coords (x_in, y_in, coeffs)
- def gps2pixel (gpsmethod, gps_coord, init_guess)

5.44.1 Function Documentation

5.44.1.1 calc_slopes()

```
def skdaccess.utilities.map_util.calc_slopes (
              topo_array,
              ppd,
              planet,
              scaled = True,
              nswe = "global",
              lon_offset = 0,
              lat_npole = 90 )
```

Calculate a slope map from a topographic dataset.

For now, this tool assumes a global topographic dataset; in the future, it will be expanded to work on regional datasets as well.

Parameters

topo_array	a global topographic dataset, in numpy array form
ppd	the pixels-per-degree of the topo array
bodyname	the name of the planetary body in question
scaled	whether values should be scaled by latitude
nswe	the (NW,SE) corners of the area-of-interest

5.44.1.2 global_coords()

```
def skdaccess.utilities.map_util.global_coords (
              x_in,
              y_in,
              coeffs )
```

Transform pixel coordinates into global coords using affine transformation coefficients.

Parameters

x_in	X pixel coordinates
y_in	Y pixel coordinates
in_coeffs	Affine transformation coefficients

Returns

global coordinates

5.44.1.3 gps2pixel()

```
def skdaccess.utilities.map_util.gps2pixel (
              gpsmethod,
              gps_coord,
              init_guess )
```

Function for finding the pixel coordinate associated with a gps coordinate.

Parameters

gpsmethod	GPS coordinate mapping function
gps_coord	GPS coordinate to match, as (lat,lon)
init_guess	Initial guess for the pixel coordinate (optional)

Returns

Integer pixel coordinate nearest to lat,lon coordinate point

5.44.1.4 sanitize_latlon()

```
def skdaccess.utilities.map_util.sanitize_latlon (
              lat_lon_tuple,
              ppd = 1,
              start_from_90N = False )
```

5.44.1.5 trim_map()

```
def skdaccess.utilities.map_util.trim_map (
              array,
              ppd,
              nswe,
              lat_npole = 90,
              lon_offset = 0 )
```

Returns a copy of a map/array trimmed to the given N, S, W, E extents.

Parameters

array	the input array to be trimmed
ppd	the pixels-per-degree of the array
nswe	a 1x4 array of the desired [N, S, W, E] edges
lat_npole	the latitude of the N Pole in the same system as the given N, S, W, E values
lat_npole	the longitude of the prime meridian in the same system as the given N, S, W, E values

Returns

trimmed_map: the input data trimmed to the desired edges

5.44.1.6 wgs84_distance()

```
def skdaccess.utilities.map_util.wgs84_distance (
              point1,
              point2,
              planet = Planet("wgs84"),
              miles = False )
```

5.45 skdaccess.utilities.modis_util Namespace Reference

Classes

- class LatLon

Functions

- def getImageType (in_data)
- def calibrateModis (data, metadata)
- def gps2pixel (gpsmethod, gps_coord, bounds)
- def rescale (in_array, max_val=0.9, min_val=-0.01)
- def checkBit (data, bit)
- def createGrid (data, y_start, y_end, x_start, x_end, y_grid, x_grid, dtype, grid_fill=np.nan)
- def getFileIDs (modis_identifier, start_date, end_date, lat, lon, daynightboth)
- def getFileURLs (file_ids)
- def getModisData (dataset, variable_name)
- def readMODISData (modis_list, variables, grid, grid_fill, use_long_name, platform, product_id)

5.45.1 Function Documentation

5.45.1.1 calibrateModis()

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

This function calibrates input modis data.

Parameters

data	Input modis data
metadata	Metadata associated with modis input data

Returns

calibrated modis data

5.45.1.2 checkBit()

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

Get the bit value from a bit flag.

Parameters

data	Integer bit flag
bit	Which bit to select (start indexing at 0)

Returns

value of chosen bit in bit flag

5.45.1.3 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 )
```

5.45.1.4 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

modis_identifier	Product identifier (e.g. MOD09)
start	date: Starting date
end	date: Ending date
lat	Latitude
lon	Longitude
daynightboth	Get daytime images ('D'), nightime images ('N') or both ('B')

Returns

list of file IDs

5.45.1.5 getFileURLs()

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

Retrieve the ftp location for a list of file IDs.

Parameters

file_ids	List of file IDs

Returns

List of ftp locations

5.45.1.6 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 (y, x, z) mode (y, x) mode (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

in_data	Input modis data

Returns

type of modis data

5.45.1.7 getModisData()

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

Loads modis data.

Parameters

dataset	netCDF4 dataset
variable_name	Name of variable to extract from dataset

Returns

(modis_data, metadata)

5.45.1.8 gps2pixel()

```
def skdaccess.utilities.modis_util.gps2pixel (
              gpsmethod,
              gps_coord,
              bounds )
```

Function for finding the pixel coordinate associated with a gps coordinate.

Parameters

gpsmethod	GPS coordinate mapping function from above
gps_coord	GPS coordinate to match, as (lat,lon)
bounds	Pixel bounds to search within ((y_low,y_high),(x_low,x_high))

Returns

Nearest integer pixel value

5.45.1.9 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

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

5.45.1.10 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

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

Returns

scaled data

5.46 skdaccess.utilities.pbo_util Namespace Reference

Functions

- def getStationCoords (pbo_info, station_list)
- def getLatLonRange (pbo_info, station_list)
- def getROIstations (geo_point, radiusParam, data, header)
- def stab_sys (data_iterator, metadata, stab_min_NE=.0005, stab_min_U=.005, sigsc=2, errProp=1)
- def propagateErrors (R, sc, stationCovs)
- def nostab_sys (allH, allD, timerng, indx=1, mdyratio=.7)
- def removeAntennaOffset (antenna_offsets, data, window_start=pd.to_timedelta('4D'), window_end=pd.to_timedelta('4D'), min_diff=0.005, debug=False)

5.46.1 Function Documentation

5.46.1.1 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

pbo_info	PBO Metadata
station_list	List of stations

Returns

list containg two tuples, lat_range and lon_range

5.46.1.2 getROIstations()

```
def skdaccess.utilities.pbo_util.getROIstations (
              geo_point,
              radiusParam,
              data,
              header )
```

5.46.1.3 getStationCoords()

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

Get the station coordinates for a list of stations.

Parameters

pbo_info	PBO Metadata
station_list	List of stations

Returns

list of tuples containing lat, lon coordinates of stations

5.46.1.4 nostab_sys()

```
def skdaccess.utilities.pbo_util.nostab_sys (
              allH,
              allD,
              timerng,
              indx = 1,
              mdyratio = .7 )
```

5.46.1.5 propagateErrors()

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

5.46.1.6 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

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

Returns

GPS data with the offsets removed

5.46.1.7 stab_sys()

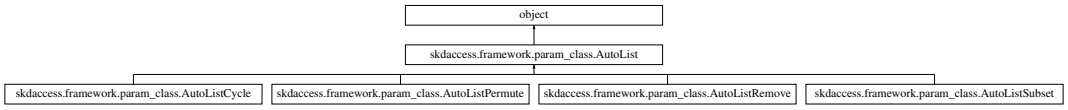
```
def skdaccess.utilities.pbo_util.stab_sys (
              data_iterator,
              metadata,
              stab_min_NE = .0005,
              stab_min_U = .005,
              sigsc = 2,
              errProp = 1 )
```

Chapter 6

Class Documentation

6.1 skdaccess.framework.param_class.AutoList Class Reference

Inheritance diagram for skdaccess.framework.param_class.AutoList:



Public Member Functions

- def __init__ (self, val_list)
- def val (self)
- def perturb (self)
- def reset (self)
- def getAllOptions (self)
- def __str__ (self)
- def __len__ (self)
- def __getitem__ (self, ii)
- def __setitem__ (self, ii, val)
- def __call__ (self)

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

val_list	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

ii	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

ii	Index of list to be set
val	Input value

6.1.3.5 __str__()

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

String representation of class.

Returns

String containing all parmaters 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 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

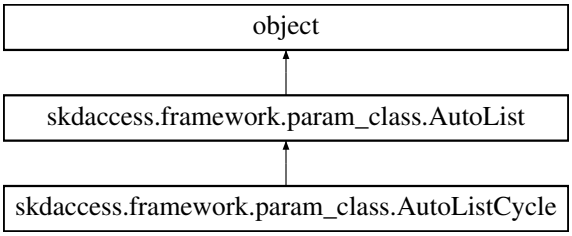
List of current parameters

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

- framework/param_class.py

6.2 skdaccess.framework.param_class.AutoListCycle Class Reference

Inheritance diagram for skdaccess.framework.param_class.AutoListCycle:



Public Member Functions

- def __init__ (self, list_val_list)
- def perturb (self)
- def reset (self)
- def getAllOptions (self)
- def val (self)
- def __str__ (self)
- def __len__ (self)
- def __getitem__ (self, ii)
- def __setitem__ (self, ii, val)
- def __call__ (self)

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

list_val_list	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

ii	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

ii	Index of list to be set
val	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

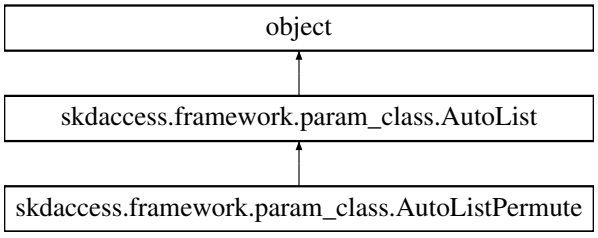
List of current parameters

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

- framework/param_class.py

6.3 skdaccess.framework.param_class.AutoListPermute Class Reference

Inheritance diagram for skdaccess.framework.param_class.AutoListPermute:



Public Member Functions

- def perturb (self)
- def val (self)
- def reset (self)
- def getAllOptions (self)
- def __str__ (self)
- def __len__ (self)
- def __getitem__ (self, ii)
- def __setitem__ (self, ii, val)
- def __call__ (self)

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

ii	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

ii	Index of list to be set
val	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

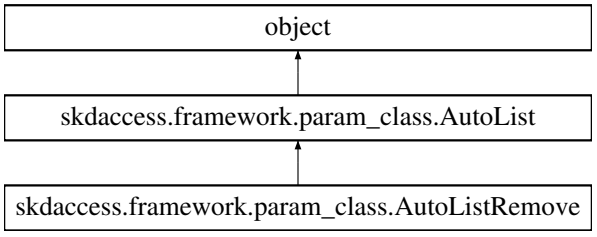
List of current parameters

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

- framework/param_class.py

6.4 skdaccess.framework.param_class.AutoListRemove Class Reference

Inheritance diagram for skdaccess.framework.param_class.AutoListRemove:



Public Member Functions

- def __init__ (self, val_list)
- def perturb (self)
- def reset (self)
- def val (self)
- def getAllOptions (self)
- def __str__ (self)
- def __len__ (self)
- def __getitem__ (self, ii)
- def __setitem__ (self, ii, val)
- def __call__ (self)

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

val_list	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

ii	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

ii	Index of list to be set
val	Input value

6.4.3.5 __str__()

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

String representation of class.

Returns

String containing all parmaters 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

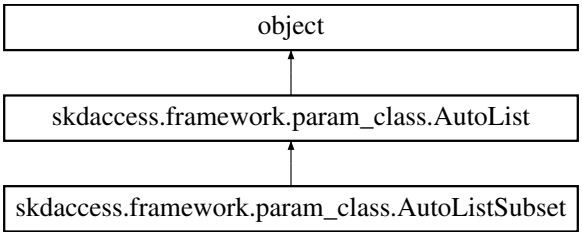
List of current parameters

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

- framework/param_class.py

6.5 skdaccess.framework.param_class.AutoListSubset Class Reference

Inheritance diagram for skdaccess.framework.param_class.AutoListSubset:



Public Member Functions

- def perturb (self)
- def val (self)
- def reset (self)
- def getAllOptions (self)
- def __str__ (self)
- def __len__ (self)
- def __getitem__ (self, ii)
- def __setitem__ (self, ii, val)
- def __call__ (self)

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

ii	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

ii	Index of list to be set
val	Input value

6.5.2.5 __str__()

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

String representation of class.

Returns

String containing all parmaters 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 )
```

Peturb 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

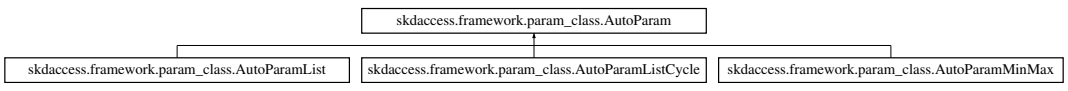
List of current parameters

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

- framework/param_class.py

6.6 skdaccess.framework.param_class.AutoParam Class Reference

Inheritance diagram for skdaccess.framework.param_class.AutoParam:



Public Member Functions

- def __init__ (self, val_init)
- def perturb (self)
- def reset (self)
- def __str__ (self)
- def __call__ (self)

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

val_init	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 )
```

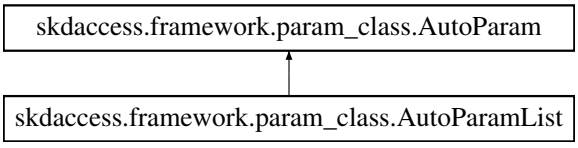
Reset value to initial value.

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

- framework/param_class.py

6.7 skdaccess.framework.param_class.AutoParamList Class Reference

Inheritance diagram for skdaccess.framework.param_class.AutoParamList:



Public Member Functions

- def __init__ (self, val_init, val_list)
- def perturb (self)
- def reset (self)
- def __str__ (self)
- def __call__ (self)

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

val_init	initial value for the parameter
val_list	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 )
```

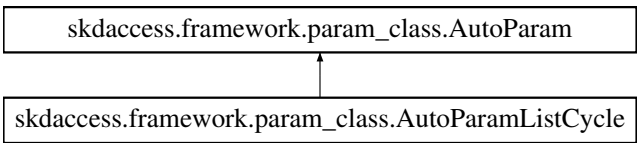
Reset the list to the default value.

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

- framework/param_class.py

6.8 skdaccess.framework.param_class.AutoParamListCycle Class Reference

Inheritance diagram for skdaccess.framework.param_class.AutoParamListCycle:



Public Member Functions

- def __init__ (self, val_list)
- def perturb (self)
- def reset (self)
- def __str__ (self)
- def __call__ (self)

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

val_list	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 )
```

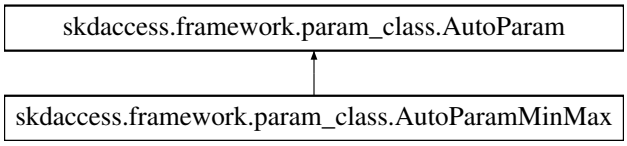
Reset the list to the default values.

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

- framework/param_class.py

6.9 skdaccess.framework.param_class.AutoParamMinMax Class Reference

Inheritance diagram for skdaccess.framework.param_class.AutoParamMinMax:



Public Member Functions

- def __init__ (self, val_init, val_min, val_max, decimals=0, extreme=0)
- def perturb (self)
- def reset (self)
- def __str__ (self)
- def __call__ (self)

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

val_init	Initial value for parameter
val_min	Minimum value for param
val_max	Maximum value for parameter
decimals	Number of decimals to include in the random number
extreme	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 )
```

Peturb the paramter 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 )
```

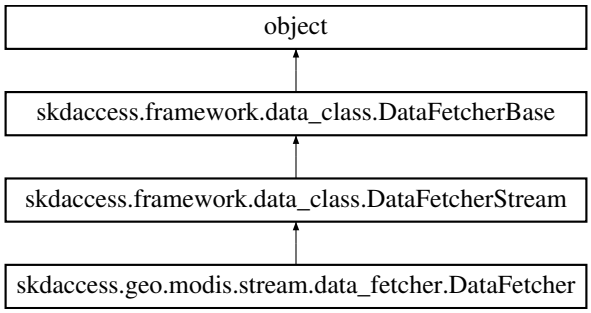
Reset to initial value.

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

- framework/param_class.py

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

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)
- def output (self)
- def retrieveOnlineData (self, data_specification)
- def multirun_enabled (self)
- def perturb (self)
- def reset (self)
- def __str__ (self)
- def getMetadata (self)
- def getConfig ()
- def writeConfig (conf)

6.10.1 Detailed Description

Data Fetcher for MODIS data.

6.10.2 Constructor & Destructor Documentation

6.10.2.1 __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

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

6.10.3 Member Function Documentation

6.10.3.1 __str__()

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

Generate string description.

6.10.3.2 getConfig()

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

Retrieve skdaccess configuration.

Returns

configParser.ConfigParser object of configuration

6.10.3.3 getMetadata()

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

Return metadata about Data Fetcher.

Returns

metadata of object.

6.10.3.4 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

6.10.3.5 output()

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

Generate data wrapper.

Returns

data wrapper of MODIS data

6.10.3.6 perturb()

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

perturb parameters

6.10.3.7 reset()

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

set all parameters to initial value

6.10.3.8 retrieveOnlineData()

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

Abstract class for downloading data into memory.

Parameters

data_specification	Data to be retrieved

Returns

Retrieved data

6.10.3.9 writeConfig()

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

Write config to disk.

Parameters

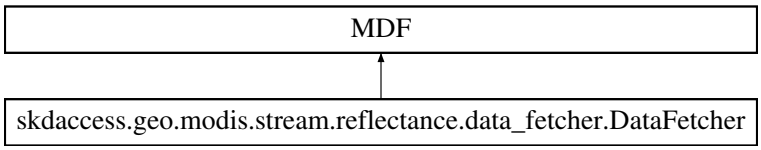
conf	configparser.ConfigParser object

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

- geo/modis/stream/data_fetcher.py

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

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)

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

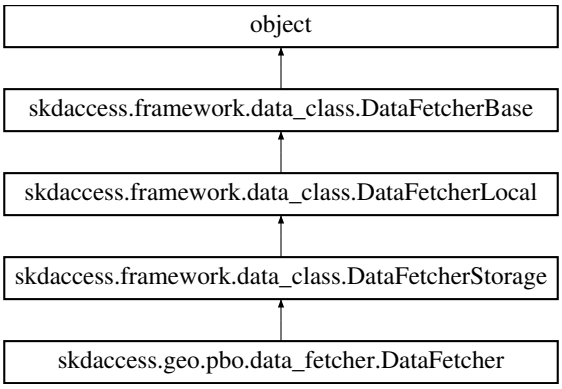
ap_paramList[lat]	Search latitude
ap_paramList[lon]	Search longitude
start_date	Starting date
end_date	Ending date
modis_platform	Paltform (Either "Terra" or "Aqua")
daynightboth	Use daytime data ('D'), nighttime data ('N') or both ('B')
grid	Further divide each image into a multiple grids of size (y,x)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

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)
- def setStationList (self, station_list)
- def getInfo (self)
- def output (self)
- def __str__ (self)
- def getStationMetadata ()
- def getAntennaLogs ()
- def downloadFullDataset (cls, out_file='pbo_data.h5', use_file=None)
- def multirun_enabled (self)
- def getDataLocation (data_name)
- def setDataLocation (data_name, location, key='data_location')
- def perturb (self)
- def reset (self)
- def getMetadata (self)
- def getConfig ()
- def writeConfig (conf)

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 )
```

Initialize a DataFetcher.

Parameters

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

out_file	Output filename for parsed data
use_file	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

data_name	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

data_name	Name of data set
location	Location of data set
key	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

station_list	List of stations to fetch

6.12.3.15 writeConfig()

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

Write config to disk.

Parameters

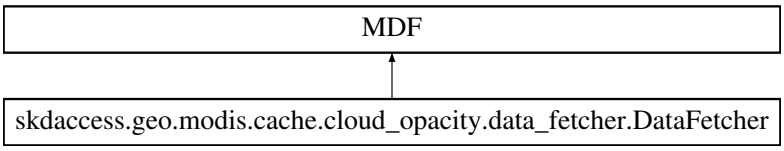
conf	configparser.ConfigParser object

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

- geo/pbo/data_fetcher.py

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

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)

6.13.1 Detailed Description

Data Fetcher for MODIS Cloud Opacity.

6.13.2 Constructor & Destructor Documentation

6.13.2.1 __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

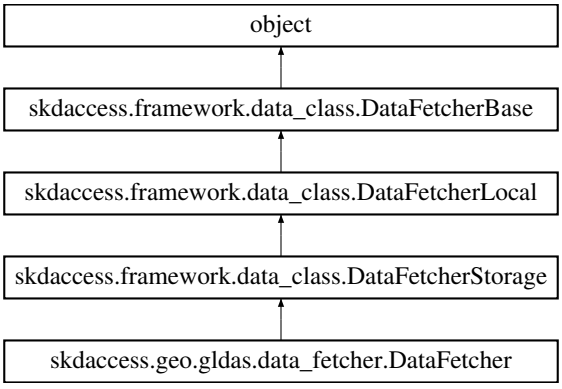
ap_paramList[lat]	Search latitude
ap_paramList[lon]	Search longitude
start_date	Starting date
end_date	Ending date
modis_platform	Paltform (Either "Terra" or "Aqua")
daynightboth	Use daytime data ('D'), nighttime data ('N') or both ('B')
grid	Further divide each image into a multiple grids of size (y,x)

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

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

6.14 skdaccess.geo.gldas.DataFetcher Class Reference

Inheritance diagram for skdaccess.geo.gldas.DataFetcher:



Public Member Functions

- def __init__ (self, ap_paramList, start_date=None, end_date=None, resample=False)
- def output (self)
- def downloadFullDataset (cls, out_file=None, use_file=None)
- def __str__ (self)
- def multirun_enabled (self)
- def getDataLocation (data_name)
- def setDataLocation (data_name, location, key='data_location')
- def perturb (self)
- def reset (self)
- def getMetadata (self)
- def getConfig ()
- def writeConfig (conf)

6.14.1 Detailed Description

Data Fetcher for GLDAS data.

6.14.2 Constructor & Destructor Documentation

6.14.2.1 __init__()

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

Construct a GLDAS Data Fetcher.

Parameters

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

6.14.3 Member Function Documentation

6.14.3.1 __str__()

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

String representation of data fetcher.

Returns

String listing the name and geopoint of data fetcher

6.14.3.2 downloadFullDataset()

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

Download GLDAS data.

Parameters

out_file	Output filename for parsed data
use_file	Directory of 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

data_name	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.gldas.DataFetcher.output (
              self )
```

Create data wrapper of GLDAS data for specified geopoint.

Returns

GLDAS 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

data_name	Name of data set
location	Location of data set
key	Key of configuration option

6.14.3.11 writeConfig()

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

Write config to disk.

Parameters

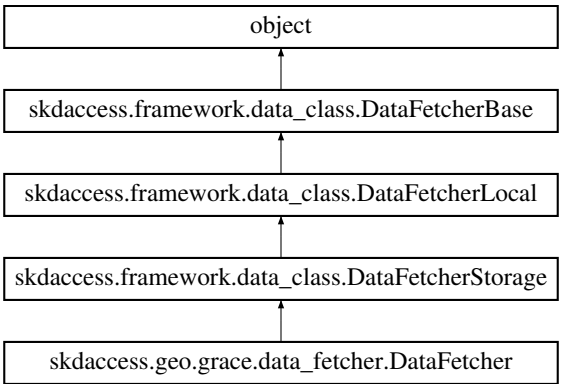
conf	configparser.ConfigParser object

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

- geo/gldas/data_fetcher.py

6.15 skdaccess.geo.grace.DataFetcher Class Reference

Inheritance diagram for skdaccess.geo.grace.DataFetcher:



Public Member Functions

- def __init__ (self, ap_paramList, start_date=None, end_date=None)
- def output (self)
- def __str__ (self)
- def downloadFullDataset (cls, out_file='grace.h5', use_file=None)
- def multirun_enabled (self)
- def getDataLocation (data_name)
- def setDataLocation (data_name, location, key='data_location')
- def perturb (self)
- def reset (self)
- def getMetadata (self)
- def getConfig ()
- def writeConfig (conf)

6.15.1 Detailed Description

Data Fetcher for GRACE data.

6.15.2 Constructor & Destructor Documentation

6.15.2.1 __init__()

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

Construct a Grace Data Fetcher.

Parameters

ap_paramList[geo_pont]	AutoList of geographic location tuples (lat,lon)
start_date	Beginning date
end_date	Ending date

6.15.3 Member Function Documentation

6.15.3.1 __str__()

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

String representation of data fetcher.

Returns

String listing the name and geopoint of data fetcher

6.15.3.2 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

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

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

data_name	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 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

6.15.3.7 output()

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

Create data wrapper of grace data for specified geopoints.

Returns

Grace Data Wrapper

6.15.3.8 perturb()

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

perturb parameters

6.15.3.9 reset()

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

set all parameters to initial value

6.15.3.10 setDataLocation()

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

Set the location of a data set.

Parameters

data_name	Name of data set
location	Location of data set
key	Key of configuration option

6.15.3.11 writeConfig()

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

Write config to disk.

Parameters

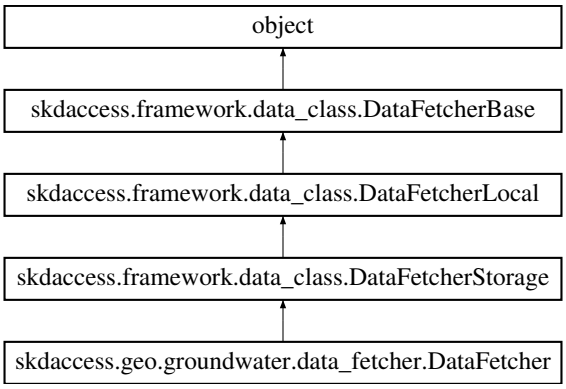
conf	configparser.ConfigParser object

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

- geo/grace/data_fetcher.py

6.16 skdaccess.geo.groundwater.DataFetcher Class Reference

Inheritance diagram for skdaccess.geo.groundwater.DataFetcher:



Public Member Functions

- def __init__ (self, ap_paramList=[ ], start_date=None, end_date=None, cutoff=0.75)
- def output (self)
- def __str__ (self)
- def getStationMetadata ()
- def downloadFullDataset (cls, out_file='gw.h5', use_file=None)
- def multirun_enabled (self)
- def getDataLocation (data_name)
- def setDataLocation (data_name, location, key='data_location')
- def perturb (self)
- def reset (self)
- def getMetadata (self)
- def getConfig ()
- def writeConfig (conf)

6.16.1 Detailed Description

Generates Data Wrappers of groundwater measurements taken in the US.

6.16.2 Constructor & Destructor Documentation

6.16.2.1 __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

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

6.16.3 Member Function Documentation

6.16.3.1 __str__()

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

String representation of data fetcher.

Returns

string describing data fetcher

6.16.3.2 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

out_file	Output filename for parsed data
local_data	Specify the directory where the data is. If None, the function will download the data

Returns

Absolute path of parsed data

6.16.3.3 getConfig()

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

Retrieve skdaccess configuration.

Returns

configParser.ConfigParser object of configuration

6.16.3.4 getDataLocation()

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

Get the location of data set.

Parameters

data_name	Name of data set

Returns

string of data location, None if not found

6.16.3.5 getMetadata()

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

Return metadata about Data Fetcher.

Returns

metadata of object.

6.16.3.6 getStationMetadata()

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

Retrieve metadata on groundwater wells.

Returns

pandas dataframe with groundwater well information

6.16.3.7 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

6.16.3.8 output()

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

Fetch Groundwater Data Wrapper.

Returns

Groundwater Data Wrapper

6.16.3.9 perturb()

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

perturb parameters

6.16.3.10 reset()

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

set all parameters to initial value

6.16.3.11 setDataLocation()

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

Set the location of a data set.

Parameters

data_name	Name of data set
location	Location of data set
key	Key of configuration option

6.16.3.12 writeConfig()

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

Write config to disk.

Parameters

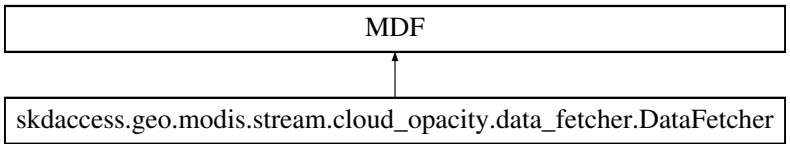
conf	configparser.ConfigParser object

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

- geo/groundwater/data_fetcher.py

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

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)

6.17.1 Detailed Description

Data Fetcher for MODIS Cloud Opacity.

6.17.2 Constructor & Destructor Documentation

6.17.2.1 __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

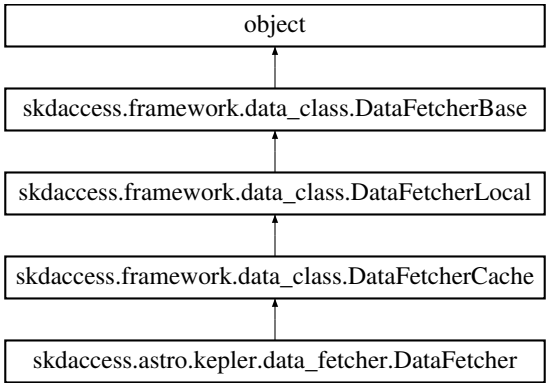
ap_paramList[lat]	Search latitude
ap_paramList[lon]	Search longitude
start_date	Starting date
end_date	Ending date
modis_platform	Paltform (Either "Terra" or "Aqua")
daynightboth	Use daytime data ('D'), nighttime data ('N') or both ('B')
grid	Further divide each image into a multiple grids of size (y,x)

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

- geo/modis/stream/cloud_opacity/data_fetcher.py

6.18 skdaccess.astro.kepler.DataFetcher Class Reference

Inheritance diagram for skdaccess.astro.kepler.DataFetcher:



Public Member Functions

- def __init__ (self, ap_paramList, quarter_list=None)
- def downloadKeplerData (self, kid_list)
- def cacheData (self, data_specification)
- def output (self)
- def multirun_enabled (self)
- def getDataLocation (data_name)
- def setDataLocation (data_name, location, key='data_location')
- def perturb (self)
- def reset (self)
- def __str__ (self)
- def getMetadata (self)
- def getConfig ()
- def writeConfig (conf)

6.18.1 Detailed Description

Data Fetcher for Kepler light curve data.

6.18.2 Constructor & Destructor Documentation

6.18.2.1 __init__()

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

Initialize Kepler Data Fetcher.

Parameters

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

6.18.3 Member Function Documentation

6.18.3.1 __str__()

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

Generate string description.

6.18.3.2 cacheData()

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

Cache Kepler data locally.

Parameters

data_specification	List of kepler IDs

6.18.3.3 downloadKeplerData()

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

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

Parameters

kid_list	List of Kepler ID's to download

Returns

dictionary of kepler data

6.18.3.4 getConfig()

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

Retrieve skdaccess configuration.

Returns

configParser.ConfigParser object of configuration

6.18.3.5 getDataLocation()

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

Get the location of data set.

Parameters

data_name	Name of data set

Returns

string of data location, None if not found

6.18.3.6 getMetadata()

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

Return metadata about Data Fetcher.

Returns

metadata of object.

6.18.3.7 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

6.18.3.8 output()

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

Output kepler data wrapper.

Returns

DataWrapper

6.18.3.9 perturb()

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

perturb parameters

6.18.3.10 reset()

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

set all parameters to initial value

6.18.3.11 setDataLocation()

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

Set the location of a data set.

Parameters

data_name	Name of data set
location	Location of data set
key	Key of configuration option

6.18.3.12 writeConfig()

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

Write config to disk.

Parameters

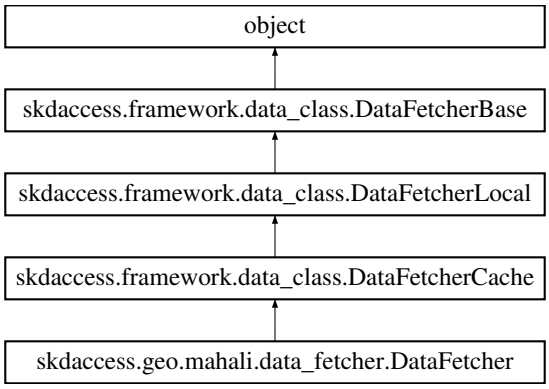
conf	configparser.ConfigParser object

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

- astro/kepler/data_fetcher.py

6.19 skdaccess.geo.mahali.DataFetcher Class Reference

Inheritance diagram for skdaccess.geo.mahali.DataFetcher:



Public Member Functions

- def __init__ (self, ap_paramList=[ ], start_date=None, end_date=None)
- def cacheData (self)
- def output (self)
- def cacheData (self, data_specification)
- def multirun_enabled (self)
- def getDataLocation (data_name)
- def setDataLocation (data_name, location, key='data_location')
- def perturb (self)
- def reset (self)
- def __str__ (self)
- def getMetadata (self)
- def getConfig ()
- def writeConfig (conf)

6.19.1 Detailed Description

Data Fetcher for Mahali Data.

6.19.2 Constructor & Destructor Documentation

6.19.2.1 __init__()

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

Initialize Mahali Data Fetcher.

Parameters

ap_paramList[stations]	Autolist of stations (Defaults to all stations)
start_date	Starting date for seelcting data (Defaults to beginning of available data)
end_date	Ending date for selecting data (Defaults to end of available data)

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.mahali.DataFetcher.cacheData (
            self )
```

Downloads all needed data.

Called by output().

6.19.3.3 cacheData() [2/2]

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

Download and store specified data to local disk.

Parameters

data_specification	Specification of data to be retrieved

6.19.3.4 getConfig()

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

Retrieve skdaccess configuration.

Returns

configParser.ConfigParser object of configuration

6.19.3.5 getDataLocation()

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

Get the location of data set.

Parameters

data_name	Name of data set

Returns

string of data location, None if not found

6.19.3.6 getMetadata()

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

Return metadata about Data Fetcher.

Returns

metadata of object.

6.19.3.7 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

6.19.3.8 output()

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

Generate dataw rapper for Mahali data.

Returns

Mahali data wrapper

6.19.3.9 perturb()

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

perturb parameters

6.19.3.10 reset()

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

set all parameters to initial value

6.19.3.11 setDataLocation()

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

Set the location of a data set.

Parameters

data_name	Name of data set
location	Location of data set
key	Key of configuration option

6.19.3.12 writeConfig()

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

Write config to disk.

Parameters

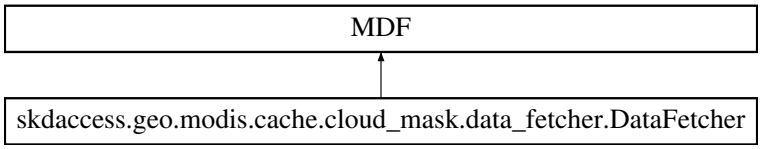
conf	configparser.ConfigParser object

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

- geo/mahali/data_fetcher.py

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

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)

6.20.1 Detailed Description

Data Fetcher for MODIS Cloud Mask.

6.20.2 Constructor & Destructor Documentation

6.20.2.1 __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

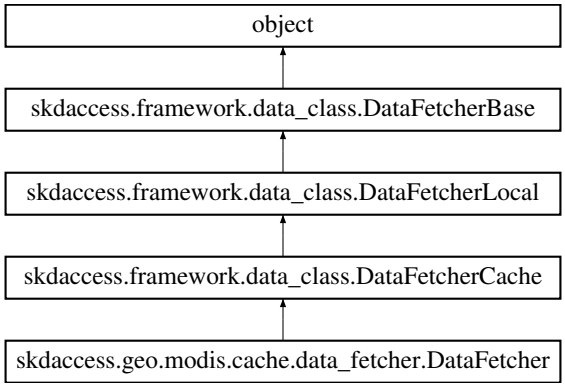
ap_paramList[lat]	Search latitude
ap_paramList[lon]	Search longitude
start_date	Starting date
end_date	Ending date
modis_platform	Paltform (Either "Terra" or "Aqua")
daynightboth	Use daytime data ('D'), nighttime data ('N') or both ('B')
grid	Further divide each image into a multiple grids of size (y,x)

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

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

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

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)
- def find_data (self, fileid_list)
- def cacheData (self, data_specification)
- def output (self)
- def multirun_enabled (self)
- def getDataLocation (data_name)
- def setDataLocation (data_name, location, key='data_location')
- def perturb (self)
- def reset (self)
- def __str__ (self)
- def getMetadata (self)
- def getConfig ()
- def writeConfig (conf)

6.21.1 Detailed Description

Data Fetcher for MODIS data.

6.21.2 Constructor & Destructor Documentation

6.21.2.1 __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

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

6.21.3 Member Function Documentation

6.21.3.1 __str__()

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

Generate string description.

6.21.3.2 cacheData()

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

Download MODIS data.

Parameters

data_specification	List of file IDs to cache

6.21.3.3 find_data()

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

Finds files previously downloaded files associated with fileids.

Parameters

fileid_list	List of file id's

Returns

Pandas series of file locaitons indexed by file id

6.21.3.4 getConfig()

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

Retrieve skdaccess configuration.

Returns

configParser.ConfigParser object of configuration

6.21.3.5 getDataLocation()

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

Get the location of data set.

Parameters

data_name	Name of data set

Returns

string of data location, None if not found

6.21.3.6 getMetadata()

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

Return metadata about Data Fetcher.

Returns

metadata of object.

6.21.3.7 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

6.21.3.8 output()

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

Generate data wrapper.

Returns

data wrapper of MODIS data

6.21.3.9 perturb()

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

perturb parameters

6.21.3.10 reset()

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

set all parameters to initial value

6.21.3.11 setDataLocation()

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

Set the location of a data set.

Parameters

data_name	Name of data set
location	Location of data set
key	Key of configuration option

6.21.3.12 writeConfig()

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

Write config to disk.

Parameters

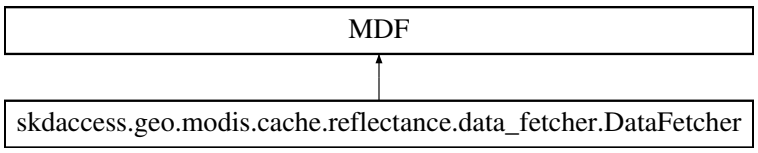
conf	configparser.ConfigParser object

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

- geo/modis/cache/data_fetcher.py

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

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)

6.22.1 Detailed Description

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

6.22.2 Constructor & Destructor Documentation

6.22.2.1 __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

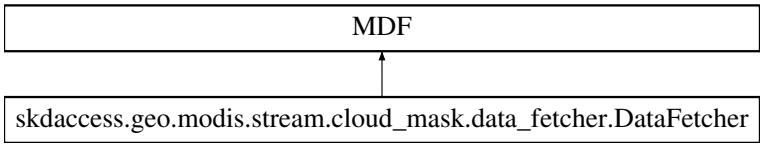
ap_paramList[lat]	Search latitude
ap_paramList[lon]	Search longitude
start_date	Starting date
end_date	Ending date
modis_platform	Paltform (Either "Terra" or "Aqua")
daynightboth	Use daytime data ('D'), nighttime data ('N') or both ('B')
grid	Further divide each image into a multiple grids of size (y,x)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

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

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

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

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)

6.23.1 Detailed Description

Data Fetcher for MODIS Cloud Mask.

6.23.2 Constructor & Destructor Documentation

6.23.2.1 __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

ap_paramList[lat]	Search latitude
ap_paramList[lon]	Search longitude
start_date	Starting date
end_date	Ending date
modis_platform	Paltform (Either "Terra" or "Aqua")
daynightboth	Use daytime data ('D'), nighttime data ('N') or both ('B')
grid	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

6.24 skdaccess.framework.data_class.DataFetcherBase Class Reference

Inheritance diagram for skdaccess.framework.data_class.DataFetcherBase:

Public Member Functions

- def __init__ (self, ap_paramList=[ ])
- def output (self)
- def perturb (self)
- def reset (self)
- def __str__ (self)
- def getMetadata (self)
- def getConfig ()
- def writeConfig (conf)
- def multirun_enabled (self)

6.24.1 Detailed Description

Base class for all data fetchers.

6.24.2 Constructor & Destructor Documentation

6.24.2.1 __init__()

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

Initialize data fetcher with parameter list.

Parameters

ap_paramList	List of parameters

6.24.3 Member Function Documentation

6.24.3.1 __str__()

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

Generate string description.

6.24.3.2 getConfig()

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

Retrieve skdaccess configuration.

Returns

configParser.ConfigParser object of configuration

6.24.3.3 getMetadata()

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

Return metadata about Data Fetcher.

Returns

metadata of object.

6.24.3.4 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

6.24.3.5 output()

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

Output data wrapper.

Returns

Datawrapper

6.24.3.6 perturb()

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

perturb parameters

6.24.3.7 reset()

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

set all parameters to initial value

6.24.3.8 writeConfig()

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

Write config to disk.

Parameters

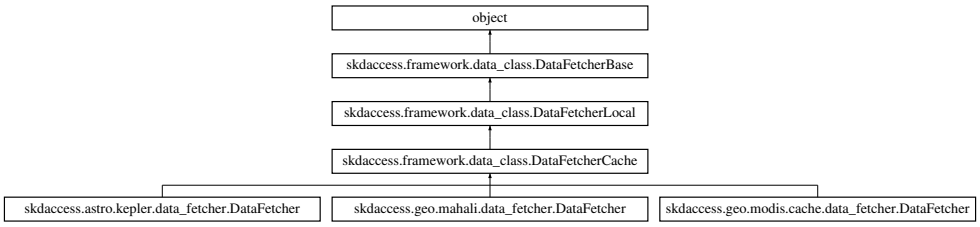
conf	configparser.ConfigParser object

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

- framework/data_class.py

6.25 skdaccess.framework.data_class.DataFetcherCache Class Reference

Inheritance diagram for skdaccess.framework.data_class.DataFetcherCache:



Public Member Functions

- def cacheData (self, data_specification)
- def multirun_enabled (self)
- def getDataLocation (data_name)
- def setDataLocation (data_name, location, key='data_location')
- def output (self)
- def perturb (self)
- def reset (self)
- def __str__ (self)
- def getMetadata (self)
- def getConfig ()
- def writeConfig (conf)

6.25.1 Detailed Description

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

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 cacheData()

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

Download and store specified data to local disk.

Parameters

data_specification	Specification of data to be retrieved

6.25.2.3 getConfig()

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

Retrieve skdaccess configuration.

Returns

configParser.ConfigParser object of configuration

6.25.2.4 getDataLocation()

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

Get the location of data set.

Parameters

data_name	Name of data set

Returns

string of data location, None if not found

6.25.2.5 getMetadata()

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

Return metadata about Data Fetcher.

Returns

metadata of object.

6.25.2.6 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

6.25.2.7 output()

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

Output data wrapper.

Returns

Datawrapper

6.25.2.8 perturb()

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

perturb parameters

6.25.2.9 reset()

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

set all parameters to initial value

6.25.2.10 setDataLocation()

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

Set the location of a data set.

Parameters

data_name	Name of data set
location	Location of data set
key	Key of configuration option

6.25.2.11 writeConfig()

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

Write config to disk.

Parameters

conf	configparser.ConfigParser object

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

- framework/data_class.py

6.26 skdaccess.framework.data_class.DataFetcherLocal Class Reference

Inheritance diagram for skdaccess.framework.data_class.DataFetcherLocal:

Public Member Functions

- def getDataLocation (data_name)
- def setDataLocation (data_name, location, key='data_location')
- def output (self)
- def perturb (self)
- def reset (self)
- def __str__ (self)
- def getMetadata (self)
- def getConfig ()
- def writeConfig (conf)
- def multirun_enabled (self)

6.26.1 Member Function Documentation

6.26.1.1 __str__()

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

Generate string description.

6.26.1.2 getConfig()

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

Retrieve skdaccess configuration.

Returns

configParser.ConfigParser object of configuration

6.26.1.3 getDataLocation()

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

Get the location of data set.

Parameters

data_name	Name of data set

Returns

string of data location, None if not found

6.26.1.4 getMetadata()

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

Return metadata about Data Fetcher.

Returns

metadata of object.

6.26.1.5 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

6.26.1.6 output()

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

Output data wrapper.

Returns

Datawrapper

6.26.1.7 perturb()

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

perturb parameters

6.26.1.8 reset()

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

set all parameters to initial value

6.26.1.9 setDataLocation()

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

Set the location of a data set.

Parameters

data_name	Name of data set
location	Location of data set
key	Key of configuration option

6.26.1.10 writeConfig()

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

Write config to disk.

Parameters

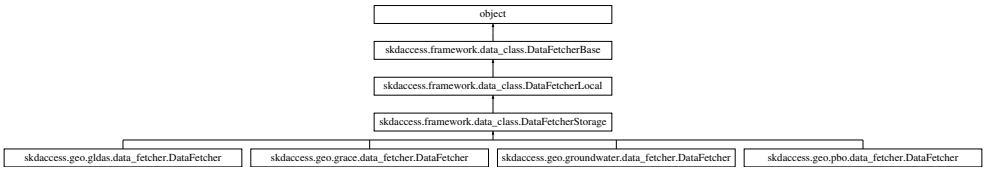
conf	configparser.ConfigParser object

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

- framework/data_class.py

6.27 skdaccess.framework.data_class.DataFetcherStorage Class Reference

Inheritance diagram for skdaccess.framework.data_class.DataFetcherStorage:



Public Member Functions

- def downloadFullDataset (cls, out_file, use_file=None)
- def multirun_enabled (self)
- def getDataLocation (data_name)
- def setDataLocation (data_name, location, key='data_location')
- def output (self)
- def perturb (self)
- def reset (self)
- def __str__ (self)
- def getMetadata (self)
- def getConfig ()
- def writeConfig (conf)

6.27.1 Detailed Description

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

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 downloadFullDataset()

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

Abstract function used to download full data set.

Parameters

out_file	output file name
use_file	Use previously downloaded data

Returns

Absolute path of parsed data

6.27.2.3 getConfig()

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

Retrieve skdaccess configuration.

Returns

configParser.ConfigParser object of configuration

6.27.2.4 getDataLocation()

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

Get the location of data set.

Parameters

data_name	Name of data set

Returns

string of data location, None if not found

6.27.2.5 getMetadata()

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

Return metadata about Data Fetcher.

Returns

metadata of object.

6.27.2.6 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

6.27.2.7 output()

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

Output data wrapper.

Returns

Datawrapper

6.27.2.8 perturb()

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

perturb parameters

6.27.2.9 reset()

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

set all parameters to initial value

6.27.2.10 setDataLocation()

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

Set the location of a data set.

Parameters

data_name	Name of data set
location	Location of data set
key	Key of configuration option

6.27.2.11 writeConfig()

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

Write config to disk.

Parameters

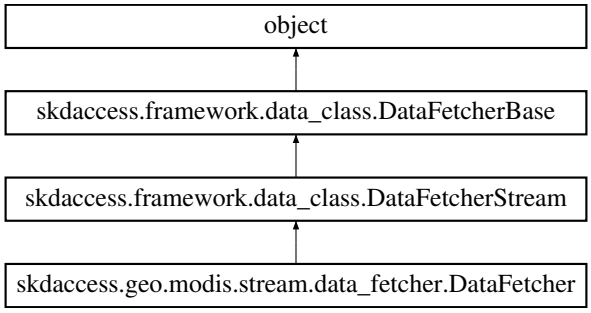
conf	configparser.ConfigParser object

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

- framework/data_class.py

6.28 skdaccess.framework.data_class.DataFetcherStream Class Reference

Inheritance diagram for skdaccess.framework.data_class.DataFetcherStream:



Public Member Functions

- def retrieveOnlineData (self, data_specification)
- def multirun_enabled (self)
- def output (self)
- def perturb (self)
- def reset (self)
- def __str__ (self)
- def getMetadata (self)
- def getConfig ()
- def writeConfig (conf)

6.28.1 Detailed Description

Data fetcher base class for downloading data into memory.

6.28.2 Member Function Documentation

6.28.2.1 __str__()

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

Generate string description.

6.28.2.2 getConfig()

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

Retrieve skdaccess configuration.

Returns

configParser.ConfigParser object of configuration

6.28.2.3 getMetadata()

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

Return metadata about Data Fetcher.

Returns

metadata of object.

6.28.2.4 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

6.28.2.5 output()

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

Output data wrapper.

Returns

Datawrapper

6.28.2.6 perturb()

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

perturb parameters

6.28.2.7 reset()

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

set all parameters to initial value

6.28.2.8 retrieveOnlineData()

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

Abstract class for downloading data into memory.

Parameters

data_specification	Data to be retrieved

Returns

Retrieved data

6.28.2.9 writeConfig()

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

Write config to disk.

Parameters

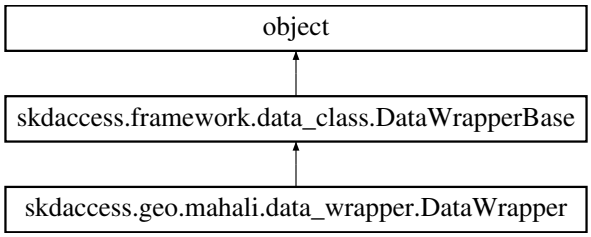
conf	configparser.ConfigParser object

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

- framework/data_class.py

6.29 skdaccess.geo.mahali.data_wrapper.DataWrapper Class Reference

Inheritance diagram for skdaccess.geo.mahali.data_wrapper.DataWrapper:



Public Member Functions

- def getIterator (self)
- def update (self, obj)
- def get (self)
- def getResults (self)
- def addResult (self, rkey, rres)
- def reset (self)
- def info (self, key=None)

6.29.1 Detailed Description

Data wrapper for Mahali 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

rkey	Result key
rres	Result

6.29.2.2 get()

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

Retrieve stored data.

Returns

Stored data

6.29.2.3 getIterator()

```
def skdaccess.geo.mahali.data_wrapper.DataWrapper.getIterator (
              self )
```

Get iterator to Mahali data.

Returns

Iterator yielding (site,date,nav,obs)

6.29.2.4 getResults()

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

Retrieve accumulated results, if any.

Returns

store results

6.29.2.5 info()

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

Get information about data wrapper.

Returns

The stored metadata

6.29.2.6 reset()

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

Reset data back to original state.

6.29.2.7 update()

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

Updated wrapped data.

Parameters

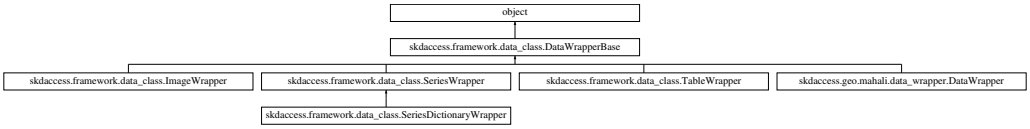
obj	New data for wrapper

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

- geo/mahali/data_wrapper.py

6.30 skdaccess.framework.data_class.DataWrapperBase Class Reference

Inheritance diagram for skdaccess.framework.data_class.DataWrapperBase:



Public Member Functions

- def __init__ (self, obj_wrap, run_id=-1, meta_data=None)
- def update (self, obj)
- def get (self)
- def getResults (self)
- def addResult (self, rkey, rres)
- def reset (self)
- def info (self, key=None)
- def getIterator (self)

6.30.1 Detailed Description

Base class for wrapping data for use in DiscoveryPipeline.

6.30.2 Constructor & Destructor Documentation

6.30.2.1 __init__()

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

Construct wrapper from input data.

Parameters

obj_wrap	Data to be wrapped
run_id	ID of the run
meta_data	Metadata to store with data

6.30.3 Member Function Documentation

6.30.3.1 addResult()

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

Add a result to the data wrapper.

Parameters

rkey	Result key
rres	Result

6.30.3.2 get()

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

Retrieve stored data.

Returns

Stored data

6.30.3.3 getIterator()

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

Get an iterator to the data.

Returns

iterator to data

6.30.3.4 getResults()

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

Retrieve accumulated results, if any.

Returns

store results

6.30.3.5 info()

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

Get information about data wrapper.

Returns

The stored metadata

6.30.3.6 reset()

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

Reset data back to original state.

6.30.3.7 update()

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

Updated wrapped data.

Parameters

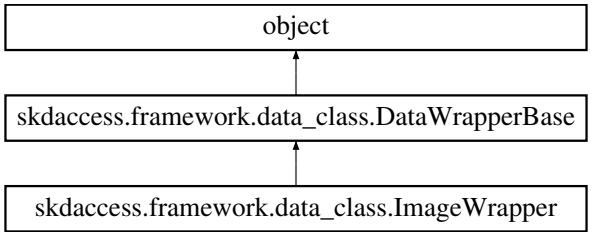
obj	New data for wrapper

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

- framework/data_class.py

6.31 skdaccess.framework.data_class.ImageWrapper Class Reference

Inheritance diagram for skdaccess.framework.data_class.ImageWrapper:



Public Member Functions

- def getIterator (self)
- def updateData (self, label, new_data)
- def deleteData (self, label)
- def update (self, obj)
- def get (self)
- def getResults (self)
- def addResult (self, rkey, rres)
- def reset (self)
- def info (self, key=None)

6.31.1 Detailed Description

Wrapper for image data.

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

rkey	Result key
rres	Result

6.31.2.2 deleteData()

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

Delete image.

Parameters

label	Delete image with label

6.31.2.3 get()

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

Retrieve stored data.

Returns

Stored data

6.31.2.4 getIterator()

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

Get an iterator to the data.

Returns

Iterator yielding (label, image_data)

6.31.2.5 getResults()

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

Retrieve accumulated results, if any.

Returns

store results

6.31.2.6 info()

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

Get information about data wrapper.

Returns

The stored metadata

6.31.2.7 reset()

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

Reset data back to original state.

6.31.2.8 update()

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

Updated wrapped data.

Parameters

obj	New data for wrapper

6.31.2.9 updateData()

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

Change image.

Parameters

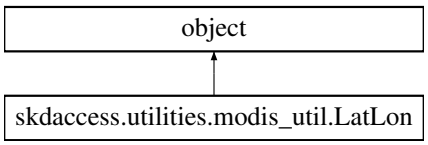
label	Label of data to be changed
new_data	New data to replace old data

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

- framework/data_class.py

6.32 skdaccess.utilities.modis_util.LatLon Class Reference

Inheritance diagram for skdaccess.utilities.modis_util.LatLon:



Public Member Functions

- def __init__ (self, metadata, x_offset=0, y_offset=0)
- def __call__ (self, y, x)

6.32.1 Detailed Description

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

6.32.2 Constructor & Destructor Documentation

6.32.2.1 __init__()

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

Initialize getLatLon object.

Parameters

x_offset	Pixel offset (used when gridding data)
y_offset	Pixel offset (used when gridding data)

6.32.3 Member Function Documentation

6.32.3.1 __call__()

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

Convert pixel coordinates to lat/lon.

Parameters

y	y coordinate
x	x coordinate

Returns

(lat, lon)

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

- utilities/modis_util.py

6.33 skdaccess.utilities.map_util.Planet Class Reference

Public Member Functions

- def __init__ (self, name)
- def get_lateraldist_array (self, ppd)
- def get_lateraldist (self, lats, ppd)
- def get_medialdist (self, lats, ppd)

6.33.1 Detailed Description

A class for storing variables about a planetary body.

6.33.2 Constructor & Destructor Documentation

6.33.2.1 __init__()

```
def skdaccess.utilities.map_util.Planet.__init__ (
            self,
            name )
```

Initialize Planet object.

Parameters

name	The name of the planetary body choice of ('earth', 'wgs84', 'grs80', or 'moon'). 'wgs84' and 'earth' provide the same planet.

6.33.3 Member Function Documentation

6.33.3.1 get_lateraldist()

```
def skdaccess.utilities.map_util.Planet.get_lateraldist (
              self,
              lats,
              ppd )
```

Get the lateral distance in meters for an input of lats.

Parameters

lats	Either a scalar or an array of latitudes
ppd	Pixels per degree of latitude

Returns

Lateral distance at each latitude in meters

6.33.3.2 get_lateraldist_array()

```
def skdaccess.utilities.map_util.Planet.get_lateraldist_array (
              self,
              ppd )
```

6.33.3.3 get_medialdist()

```
def skdaccess.utilities.map_util.Planet.get_medialdist (
              self,
              lats,
              ppd )
```

Get the medial distance at specific lattitudes.

Parameters

lats	Either a scalar or an array of latitudes
ppd	Pixels per degree of latitude

Returns

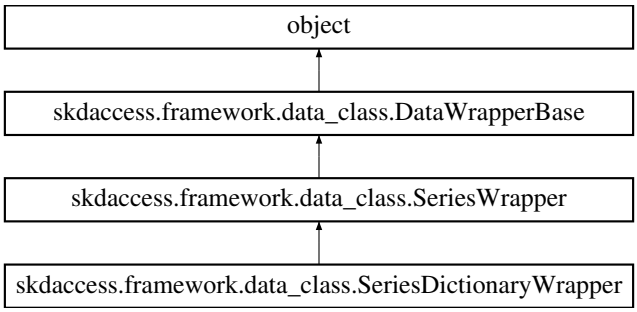
Medial distance at each latitude in meters

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

- utilities/map_util.py

6.34 skdaccess.framework.data_class.SeriesDictionaryWrapper Class Reference

Inheritance diagram for skdaccess.framework.data_class.SeriesDictionaryWrapper:



Public Member Functions

- def getIterator (self)
- def getIndices (self)
- def getLength (self)
- def update (self, obj)
- def get (self)
- def getResults (self)
- def addResult (self, rkey, rres)
- def reset (self)
- def info (self, key=None)

6.34.1 Detailed Description

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

6.34.2 Member Function Documentation

6.34.2.1 addResult()

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

Add a result to the data wrapper.

Parameters

rkey	Result key
rres	Result

6.34.2.2 get()

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

Retrieve stored data.

Returns

Stored data

6.34.2.3 getIndices()

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

Get the indices of the data.

Returns

index of data

6.34.2.4 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

6.34.2.5 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

6.34.2.6 getResults()

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

Retrieve accumulated results, if any.

Returns

store results

6.34.2.7 info()

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

Get information about data wrapper.

Returns

The stored metadata

6.34.2.8 reset()

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

Reset data back to original state.

6.34.2.9 update()

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

Updated wrapped data.

Parameters

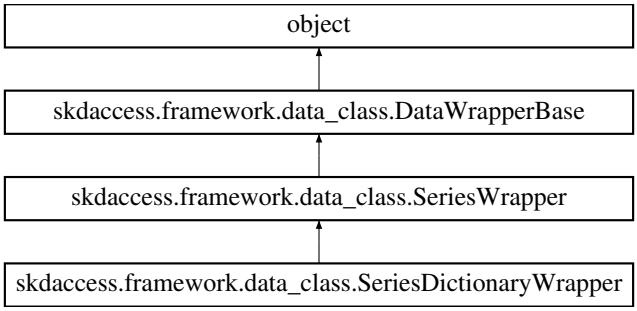
obj	New data for wrapper

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

- framework/data_class.py

6.35 skdaccess.framework.data_class.SeriesWrapper Class Reference

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)
- def getIterator (self)
- def getIndices (self)
- def getLength (self)
- def update (self, obj)
- def get (self)
- def getResults (self)
- def addResult (self, rkey, rres)
- def reset (self)
- def info (self, key=None)

6.35.1 Detailed Description

Data wrapper for series data using a data panel.

6.35.2 Constructor & Destructor Documentation

6.35.2.1 __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

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

6.35.3 Member Function Documentation

6.35.3.1 addResult()

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

Add a result to the data wrapper.

Parameters

rkey	Result key
rres	Result

6.35.3.2 get()

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

Retrieve stored data.

Returns

Stored data

6.35.3.3 getIndices()

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

Get the indicies of the data.

Returns

index of data

6.35.3.4 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

6.35.3.5 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

6.35.3.6 getResults()

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

Retrieve accumulated results, if any.

Returns

store results

6.35.3.7 info()

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

Get information about data wrapper.

Returns

The stored metadata

6.35.3.8 reset()

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

Reset data back to original state.

6.35.3.9 update()

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

Updated wrapped data.

Parameters

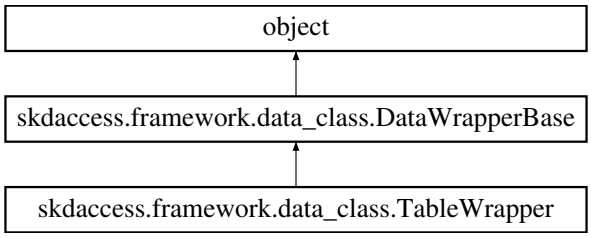
obj	New data for wrapper

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

- framework/data_class.py

6.36 skdaccess.framework.data_class.TableWrapper Class Reference

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)
- def getIterator (self)
- def getLength (self)
- def updateData (self, label, index, column_names, new_data)
- def addColumn (self, label, column_names, new_data)
- def getDefaultColumns (self)
- def getDefaultErrorColumns (self)

- def removeFrames (self, label_list)
- def updateFrames (self, label_list, frame_list)
- def update (self, obj)
- def get (self)
- def getResults (self)
- def addResult (self, rkey, rres)
- def reset (self)
- def info (self, key=None)

6.36.1 Detailed Description

Data wrapper for table data using an ordered dictionary.

6.36.2 Constructor & Destructor Documentation

6.36.2.1 __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

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

6.36.3 Member Function Documentation

6.36.3.1 addColumn()

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

Add new column to data.

Parameters

label	Data label
column_names	Names of columns to update
new_data	New data to add

6.36.3.2 addResult()

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

Add a result to the data wrapper.

Parameters

rkey	Result key
rres	Result

6.36.3.3 get()

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

Retrieve stored data.

Returns

Stored data

6.36.3.4 getDefaultColumns()

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

Get the default columns of data.

Returns

List of default columns

6.36.3.5 getDefaultErrorColumns()

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

Get the default error columns of data.

Returns

List of default error columns

6.36.3.6 getIterator()

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

Iterator access to data.

Iterates over the minor axis.

```
   @return iterator to (label, data frame) from Dictionary
```

6.36.3.7 getLength()

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

Returns

Number of data frames

6.36.3.8 getResults()

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

Retrieve accumulated results, if any.

Returns

store results

6.36.3.9 info()

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

Get information about data wrapper.

Returns

The stored metadata

6.36.3.10 removeFrames()

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

Remove Data Frames from wrapper.

Parameters

label_list	List of labels to remove

6.36.3.11 reset()

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

Reset data back to original state.

6.36.3.12 update()

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

Updated wrapped data.

Parameters

obj	New data for wrapper

6.36.3.13 updateData()

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

Update wrapped data.

Parameters

label	Data label
index	Index of data to update
column_names	Names of columns to update
new_data	Data to replace the old data

6.36.3.14 updateFrames()

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

Update data frames.

Parameters

label_list	List of labels to update
frame_list	List of updated frames

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

Namespaces

- skdaccess.astro.kepler.data_fetcher

7.2 geo/gldas/data_fetcher.py File Reference

Classes

- class skdaccess.geo.gldas.DataFetcher

Namespaces

- skdaccess.geo.gldas.data_fetcher

7.3 geo/grace/data_fetcher.py File Reference

Classes

- class skdaccess.geo.grace.DataFetcher

Namespaces

- skdaccess.geo.grace.data_fetcher

7.4 geo/groundwater/data_fetcher.py File Reference

Classes

- class skdaccess.geo.groundwater.DataFetcher

Namespaces

- skdaccess.geo.groundwater.data_fetcher

7.5 geo/mahali/data_fetcher.py File Reference

Classes

- class skdaccess.geo.mahali.DataFetcher

Namespaces

- skdaccess.geo.mahali.data_fetcher

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

Classes

- class skdaccess.geo.modis.cache.cloud_mask.DataFetcher

Namespaces

- skdaccess.geo.modis.cache.cloud_mask.data_fetcher

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

Classes

- class skdaccess.geo.modis.cache.cloud_opacity.DataFetcher

Namespaces

- skdaccess.geo.modis.cache.cloud_opacity.data_fetcher

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

Classes

- class skdaccess.geo.modis.cache.DataFetcher

Namespaces

- skdaccess.geo.modis.cache.data_fetcher

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

Classes

- class skdaccess.geo.modis.cache.reflectance.DataFetcher

Namespaces

- skdaccess.geo.modis.cache.reflectance.data_fetcher

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

Classes

- class skdaccess.geo.modis.stream.cloud_mask.DataFetcher

Namespaces

- skdaccess.geo.modis.stream.cloud_mask.data_fetcher

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

Classes

- class skdaccess.geo.modis.stream.cloud_opacity.DataFetcher

Namespaces

- skdaccess.geo.modis.stream.cloud_opacity.data_fetcher

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

Classes

- class skdaccess.geo.modis.stream.DataFetcher

Namespaces

- skdaccess.geo.modis.stream.data_fetcher

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

Classes

- class skdaccess.geo.modis.stream.reflectance.DataFetcher

Namespaces

- skdaccess.geo.modis.stream.reflectance.data_fetcher

7.14 geo/pbo/data_fetcher.py File Reference

Classes

- class skdaccess.geo.pbo.DataFetcher

Namespaces

- skdaccess.geo.pbo.data_fetcher

7.15 bin/skdaccess.py File Reference

Namespaces

- skdaccess.bin.skdaccess

Functions

- def skdaccess.bin.skdaccess.skdaccess_script ()

7.16 examples/groundwater_example.py File Reference

Namespaces

- groundwater_example

Variables

- groundwater_example.fullDF
- groundwater_example.fullDW = fullDF.output()
- groundwater_example.meta_data = WDF.getStationMetadata()
- groundwater_example.dataIt = fullDW.getIterator()
- groundwater_example.label_1
- groundwater_example.data_1
- groundwater_example.label_2
- groundwater_example.data_2
- groundwater_example.color

7.17 framework/data_class.py File Reference

Classes

- class skdaccess.framework.data_class.DataFetcherBase
- class skdaccess.framework.data_class.DataFetcherLocal
- class skdaccess.framework.data_class.DataFetcherStorage
- class skdaccess.framework.data_class.DataFetcherStream
- class skdaccess.framework.data_class.DataFetcherCache
- class skdaccess.framework.data_class.DataWrapperBase
- class skdaccess.framework.data_class.SeriesWrapper
- class skdaccess.framework.data_class.SeriesDictionaryWrapper
- class skdaccess.framework.data_class.TableWrapper
- class skdaccess.framework.data_class.ImageWrapper

Namespaces

- skdaccess.framework.data_class

7.18 framework/param_class.py File Reference

Classes

- class skdaccess.framework.param_class.AutoParam
- class skdaccess.framework.param_class.AutoParamMinMax
- class skdaccess.framework.param_class.AutoParamList
- class skdaccess.framework.param_class.AutoParamListCycle
- class skdaccess.framework.param_class.AutoList
- class skdaccess.framework.param_class.AutoListSubset
- class skdaccess.framework.param_class.AutoListPermute
- class skdaccess.framework.param_class.AutoListRemove
- class skdaccess.framework.param_class.AutoListCycle

Namespaces

- skdaccess.framework.param_class

7.19 geo/mahali/data_wrapper.py File Reference

Classes

- class skdaccess.geo.mahali.data_wrapper.DataWrapper

Namespaces

- skdaccess.geo.mahali.data_wrapper

7.20 utilities/grace_util.py File Reference

Namespaces

- skdaccess.utilities.grace_util

Functions

- def skdaccess.utilities.grace_util.average_dates (dates, round_nearest_day=False)
- def skdaccess.utilities.grace_util.dateMismatch (dates, days=10)
- def skdaccess.utilities.grace_util.compute_ewd (grace_data, scale_factor, round_nearest_day=False)
- def skdaccess.utilities.grace_util.read_grace_data (filename, lat_name, lon_name, data_name, time=None)

7.21 utilities/gw_util.py File Reference

Namespaces

- skdaccess.utilities.gw_util

Functions

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

7.22 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')

7.23 utilities/map_util.py File Reference

Classes

- class skdaccess.utilities.map_util.Planet

Namespaces

- skdaccess.utilities.map_util

Functions

- def skdaccess.utilities.map_util.sanitize_latlon (lat_lon_tuple, ppd=1, start_from_90N=False)
- def skdaccess.utilities.map_util.trim_map (array, ppd, nswe, lat_npole=90, lon_offset=0)
- def skdaccess.utilities.map_util.calc_slopes (topo_array, ppd, planet, scaled=True, nswe="global", lon_offset=0, lat_npole=90)
- def skdaccess.utilities.map_util.wgs84_distance (point1, point2, planet=Planet("wgs84"), miles=False)
- def skdaccess.utilities.map_util.global_coords (x_in, y_in, coeffs)
- def skdaccess.utilities.map_util.gps2pixel (gpsmethod, gps_coord, init_guess)

7.24 utilities/modis_util.py File Reference

Classes

- class skdaccess.utilities.modis_util.LatLon

Namespaces

- skdaccess.utilities.modis_util

Functions

- def skdaccess.utilities.modis_util.getImageType (in_data)
- def skdaccess.utilities.modis_util.calibrateModis (data, metadata)
- def skdaccess.utilities.modis_util.gps2pixel (gpsmethod, gps_coord, bounds)
- def skdaccess.utilities.modis_util.rescale (in_array, max_val=0.9, min_val=-0.01)
- def skdaccess.utilities.modis_util.checkBit (data, bit)
- def skdaccess.utilities.modis_util.createGrid (data, y_start, y_end, x_start, x_end, y_grid, x_grid, dtype, grid_↩ fill=np.nan)
- def skdaccess.utilities.modis_util.getFileIDs (modis_identifier, start_date, end_date, lat, lon, daynightboth)
- def skdaccess.utilities.modis_util.getFileURLs (file_ids)
- def skdaccess.utilities.modis_util.getModisData (dataset, variable_name)
- def skdaccess.utilities.modis_util.readMODISData (modis_list, variables, grid, grid_fill, use_long_name, platform, product_id)

7.25 utilities/pbo_util.py File Reference

Namespaces

- skdaccess.utilities.pbo_util

Functions

- def skdaccess.utilities.pbo_util.getStationCoords (pbo_info, station_list)
- def skdaccess.utilities.pbo_util.getLatLonRange (pbo_info, station_list)
- def skdaccess.utilities.pbo_util.getROIstations (geo_point, radiusParam, data, header)
- def skdaccess.utilities.pbo_util.stab_sys (data_iterator, metadata, stab_min_NE=.0005, stab_min_U=.005, sigsc=2, errProp=1)
- def skdaccess.utilities.pbo_util.propagateErrors (R, sc, stationCovs)
- def skdaccess.utilities.pbo_util.nostab_sys (allH, allD, timerng, indx=1, mdyratio=.7)
- def skdaccess.utilities.pbo_util.removeAntennaOffset (antenna_offsets, data, window_start=pd.to_timedelta('4↩ D'), window_end=pd.to_timedelta('4D'), min_diff=0.005, debug=False)

Index

__call__
skdaccess::framework::param_class::AutoList, 32
skdaccess::framework::param_class::AutoListCycle, 35
skdaccess::framework::param_class::AutoList↩ Permute, 38
skdaccess::framework::param_class::AutoList↩ Remove, 41
skdaccess::framework::param_class::AutoList↩ Subset, 44
skdaccess::framework::param_class::AutoParam, 47
skdaccess::framework::param_class::AutoParamList, 49
skdaccess::framework::param_class::AutoParam↩ ListCycle, 51
skdaccess::framework::param_class::AutoParam↩ MinMax, 53
skdaccess::utilities::modis_util::LatLon, 120
__getitem__
skdaccess::framework::param_class::AutoList, 32
skdaccess::framework::param_class::AutoListCycle, 35
skdaccess::framework::param_class::AutoList↩ Permute, 38
skdaccess::framework::param_class::AutoList↩ Remove, 41
skdaccess::framework::param_class::AutoList↩ Subset, 44
__init__
skdaccess::astro::kepler::data_fetcher::DataFetcher, 80
skdaccess::framework::data_class::DataFetcher↩ Base, 96
skdaccess::framework::data_class::DataWrapper↩ Base, 114
skdaccess::framework::data_class::SeriesWrapper, 126
skdaccess::framework::data_class::TableWrapper, 130
skdaccess::framework::param_class::AutoList, 31
skdaccess::framework::param_class::AutoListCycle, 35
skdaccess::framework::param_class::AutoList↩ Remove, 41
skdaccess::framework::param_class::AutoParam, 47
skdaccess::framework::param_class::AutoParamList, 49
skdaccess::framework::param_class::AutoParam↩ ListCycle, 51
skdaccess::framework::param_class::AutoParam↩ MinMax, 53
skdaccess::geo::gldas::data_fetcher::DataFetcher, 66
skdaccess::geo::grace::data_fetcher::DataFetcher, 70
skdaccess::geo::groundwater::data_fetcher::Data↩ Fetcher, 74
skdaccess::geo::mahali::data_fetcher::DataFetcher, 84
skdaccess::geo::modis::cache::cloud_mask::data_↩ fetcher::DataFetcher, 88
skdaccess::geo::modis::cache::cloud_opacity↩ ::data_fetcher::DataFetcher, 65
skdaccess::geo::modis::cache::data_fetcher::Data↩ Fetcher, 90
skdaccess::geo::modis::cache::reflectance::data_↩ fetcher::DataFetcher, 94
skdaccess::geo::modis::stream::cloud_mask::data↩ _fetcher::DataFetcher, 95
skdaccess::geo::modis::stream::cloud_opacity↩ ::data_fetcher::DataFetcher, 79
skdaccess::geo::modis::stream::data_fetcher::↩ DataFetcher, 55
skdaccess::geo::modis::stream::reflectance::data_↩ fetcher::DataFetcher, 58
skdaccess::geo::pbo::data_fetcher::DataFetcher, 60
skdaccess::utilities::map_util::Planet, 121
skdaccess::utilities::modis_util::LatLon, 120
__len__
skdaccess::framework::param_class::AutoList, 32
skdaccess::framework::param_class::AutoListCycle, 36
skdaccess::framework::param_class::AutoList↩ Permute, 38
skdaccess::framework::param_class::AutoList↩ Remove, 42
skdaccess::framework::param_class::AutoList↩ Subset, 45
__setitem__
skdaccess::framework::param_class::AutoList, 32

skdaccess::framework::param_class::AutoListCycle, 36
skdaccess::framework::param_class::AutoList↩ Permute, 39
skdaccess::framework::param_class::AutoList↩ Remove, 42
skdaccess::framework::param_class::AutoList↩ Subset, 45
__str__
skdaccess::astro::kepler::data_fetcher::DataFetcher, 80
skdaccess::framework::data_class::DataFetcher↩ Base, 97
skdaccess::framework::data_class::DataFetcher↩ Cache, 99
skdaccess::framework::data_class::DataFetcher↩ Local, 103
skdaccess::framework::data_class::DataFetcher↩ Storage, 106
skdaccess::framework::data_class::DataFetcher↩ Stream, 109
skdaccess::framework::param_class::AutoList, 33
skdaccess::framework::param_class::AutoListCycle, 36
skdaccess::framework::param_class::AutoList↩ Permute, 39
skdaccess::framework::param_class::AutoList↩ Remove, 42
skdaccess::framework::param_class::AutoList↩ Subset, 45
skdaccess::framework::param_class::AutoParam, 47
skdaccess::framework::param_class::AutoParamList, 49
skdaccess::framework::param_class::AutoParam↩ ListCycle, 51
skdaccess::framework::param_class::AutoParam↩ MinMax, 53
skdaccess::geo::gldas::data_fetcher::DataFetcher, 66
skdaccess::geo::grace::data_fetcher::DataFetcher, 71
skdaccess::geo::groundwater::data_fetcher::Data↩ Fetcher, 75
skdaccess::geo::mahali::data_fetcher::DataFetcher, 85
skdaccess::geo::modis::cache::data_fetcher::Data↩ Fetcher, 90
skdaccess::geo::modis::stream::data_fetcher::↩ DataFetcher, 55
skdaccess::geo::pbo::data_fetcher::DataFetcher, 60

addColumn
skdaccess::framework::data_class::TableWrapper, 130
addResult
skdaccess::framework::data_class::DataWrapper↩ Base, 115
skdaccess::framework::data_class::ImageWrapper, 117
skdaccess::framework::data_class::SeriesDictionary↩ Wrapper, 123
skdaccess::framework::data_class::SeriesWrapper, 127
skdaccess::framework::data_class::TableWrapper, 131
skdaccess::geo::mahali::data_wrapper::Data↩ Wrapper, 112
astro/kepler/data_fetcher.py, 135
average_dates
skdaccess::utilities::grace_util, 18

bin/skdaccess.py, 138

cacheData
skdaccess::astro::kepler::data_fetcher::DataFetcher, 80
skdaccess::framework::data_class::DataFetcher↩ Cache, 99
skdaccess::geo::mahali::data_fetcher::DataFetcher, 85
skdaccess::geo::modis::cache::data_fetcher::Data↩ Fetcher, 90
calc_slopes
skdaccess::utilities::map_util, 20
calibrateModis
skdaccess::utilities::modis_util, 23
checkBit
skdaccess::utilities::modis_util, 23
color
groundwater_example, 9
combine_water_heights
skdaccess::utilities::gw_util, 19
compute_ewd
skdaccess::utilities::grace_util, 18
createGrid
skdaccess::utilities::modis_util, 23

data_1
groundwater_example, 9
data_2
groundwater_example, 9
dataIt
groundwater_example, 9
dateMismatch
skdaccess::utilities::grace_util, 18
deleteData
skdaccess::framework::data_class::ImageWrapper, 117
downloadFullDataset

skdaccess::framework::data_class::DataFetcher↩ Storage, 106
skdaccess::geo::gldas::data_fetcher::DataFetcher, 67
skdaccess::geo::grace::data_fetcher::DataFetcher, 71
skdaccess::geo::groundwater::data_fetcher::Data↩ Fetcher, 75
skdaccess::geo::pbo::data_fetcher::DataFetcher, 60
downloadKeplerData
skdaccess::astro::kepler::data_fetcher::DataFetcher, 81

examples/groundwater_example.py, 139

find_data
skdaccess::geo::modis::cache::data_fetcher::Data↩ Fetcher, 91
framework/data_class.py, 139
framework/param_class.py, 140
fullDF
groundwater_example, 10
fullDW
groundwater_example, 10

geo/gldas/data_fetcher.py, 135
geo/grace/data_fetcher.py, 135
geo/groundwater/data_fetcher.py, 136
geo/mahali/data_fetcher.py, 136
geo/mahali/data_wrapper.py, 140
geo/modis/cache/cloud_mask/data_fetcher.py, 136
geo/modis/cache/cloud_opacity/data_fetcher.py, 136
geo/modis/cache/data_fetcher.py, 137
geo/modis/cache/reflectance/data_fetcher.py, 137
geo/modis/stream/cloud_mask/data_fetcher.py, 137
geo/modis/stream/cloud_opacity/data_fetcher.py, 137
geo/modis/stream/data_fetcher.py, 138
geo/modis/stream/reflectance/data_fetcher.py, 138
geo/pbo/data_fetcher.py, 138
get
skdaccess::framework::data_class::DataWrapper↩ Base, 115
skdaccess::framework::data_class::ImageWrapper, 117
skdaccess::framework::data_class::SeriesDictionary↩ Wrapper, 124
skdaccess::framework::data_class::SeriesWrapper, 127
skdaccess::framework::data_class::TableWrapper, 131
skdaccess::geo::mahali::data_wrapper::Data↩ Wrapper, 112
get_lateraldist
skdaccess::utilities::map_util::Planet, 122
get_lateraldist_array
skdaccess::utilities::map_util::Planet, 122
get_medialdist
skdaccess::utilities::map_util::Planet, 122
getAllOptions
skdaccess::framework::param_class::AutoList, 33
skdaccess::framework::param_class::AutoListCycle, 36
skdaccess::framework::param_class::AutoList↩ Permute, 39
skdaccess::framework::param_class::AutoList↩ Remove, 43
skdaccess::framework::param_class::AutoList↩ Subset, 45
getAntennaLogs
skdaccess::geo::pbo::data_fetcher::DataFetcher, 61
getConfig
skdaccess::astro::kepler::data_fetcher::DataFetcher, 81
skdaccess::framework::data_class::DataFetcher↩ Base, 97
skdaccess::framework::data_class::DataFetcher↩ Cache, 100
skdaccess::framework::data_class::DataFetcher↩ Local, 103
skdaccess::framework::data_class::DataFetcher↩ Storage, 106
skdaccess::framework::data_class::DataFetcher↩ Stream, 109
skdaccess::geo::gldas::data_fetcher::DataFetcher, 67
skdaccess::geo::grace::data_fetcher::DataFetcher, 71
skdaccess::geo::groundwater::data_fetcher::Data↩ Fetcher, 75
skdaccess::geo::mahali::data_fetcher::DataFetcher, 85
skdaccess::geo::modis::cache::data_fetcher::Data↩ Fetcher, 91
skdaccess::geo::modis::stream::data_fetcher::↩ DataFetcher, 55
skdaccess::geo::pbo::data_fetcher::DataFetcher, 61
getDataLocation
skdaccess::astro::kepler::data_fetcher::DataFetcher, 81
skdaccess::framework::data_class::DataFetcher↩ Cache, 100
skdaccess::framework::data_class::DataFetcher↩ Local, 103
skdaccess::framework::data_class::DataFetcher↩ Storage, 106
skdaccess::geo::gldas::data_fetcher::DataFetcher, 67
skdaccess::geo::grace::data_fetcher::DataFetcher, 71

skdaccess::geo::groundwater::data_fetcher::Data↩ Fetcher, 76
skdaccess::geo::mahali::data_fetcher::DataFetcher, 86
skdaccess::geo::modis::cache::data_fetcher::Data↩ Fetcher, 91
skdaccess::geo::pbo::data_fetcher::DataFetcher, 61
getDefaultColumns
skdaccess::framework::data_class::TableWrapper, 131
getDefaultErrorColumns
skdaccess::framework::data_class::TableWrapper, 131
getFileIDs
skdaccess::utilities::modis_util, 24
getFileURLs
skdaccess::utilities::modis_util, 24
getImageType
skdaccess::utilities::modis_util, 24
getIndices
skdaccess::framework::data_class::SeriesDictionary↩ Wrapper, 124
skdaccess::framework::data_class::SeriesWrapper, 127
getInfo
skdaccess::geo::pbo::data_fetcher::DataFetcher, 62
getIterator
skdaccess::framework::data_class::DataWrapper↩ Base, 115
skdaccess::framework::data_class::ImageWrapper, 118
skdaccess::framework::data_class::SeriesDictionary↩ Wrapper, 124
skdaccess::framework::data_class::SeriesWrapper, 127
skdaccess::framework::data_class::TableWrapper, 132
skdaccess::geo::mahali::data_wrapper::Data↩ Wrapper, 112
getLatLonRange
skdaccess::utilities::pbo_util, 27
getLength
skdaccess::framework::data_class::SeriesDictionary↩ Wrapper, 124
skdaccess::framework::data_class::SeriesWrapper, 128
skdaccess::framework::data_class::TableWrapper, 132
getMetadata
skdaccess::astro::kepler::data_fetcher::DataFetcher, 82
skdaccess::framework::data_class::DataFetcher↩ Base, 97
skdaccess::framework::data_class::DataFetcher↩ Cache, 100
skdaccess::framework::data_class::DataFetcher↩ Local, 103
skdaccess::framework::data_class::DataFetcher↩ Storage, 107
skdaccess::framework::data_class::DataFetcher↩ Stream, 109
skdaccess::geo::gldas::data_fetcher::DataFetcher, 68
skdaccess::geo::grace::data_fetcher::DataFetcher, 72
skdaccess::geo::groundwater::data_fetcher::Data↩ Fetcher, 76
skdaccess::geo::mahali::data_fetcher::DataFetcher, 86
skdaccess::geo::modis::cache::data_fetcher::Data↩ Fetcher, 92
skdaccess::geo::modis::stream::data_fetcher::↩ DataFetcher, 56
skdaccess::geo::pbo::data_fetcher::DataFetcher, 62
getModisData
skdaccess::utilities::modis_util, 25
getROIstations
skdaccess::utilities::pbo_util, 27
getResults
skdaccess::framework::data_class::DataWrapper↩ Base, 115
skdaccess::framework::data_class::ImageWrapper, 118
skdaccess::framework::data_class::SeriesDictionary↩ Wrapper, 124
skdaccess::framework::data_class::SeriesWrapper, 128
skdaccess::framework::data_class::TableWrapper, 132
skdaccess::geo::mahali::data_wrapper::Data↩ Wrapper, 112
getStationCoords
skdaccess::utilities::pbo_util, 27
getStationMetadata
skdaccess::geo::groundwater::data_fetcher::Data↩ Fetcher, 76
skdaccess::geo::pbo::data_fetcher::DataFetcher, 62
global_coords
skdaccess::utilities::map_util, 21
gps2pixel
skdaccess::utilities::map_util, 21
skdaccess::utilities::modis_util, 25
groundwater_example, 9
color, 9
data_1, 9
data_2, 9
dataIt, 9
fullDF, 10

fullDW, 10
label_1, 10
label_2, 10
meta_data, 10

info
skdaccess::framework::data_class::DataWrapper↩ Base, 115
skdaccess::framework::data_class::ImageWrapper, 118
skdaccess::framework::data_class::SeriesDictionary↩ Wrapper, 125
skdaccess::framework::data_class::SeriesWrapper, 128
skdaccess::framework::data_class::TableWrapper, 132
skdaccess::geo::mahali::data_wrapper::Data↩ Wrapper, 113

label_1
groundwater_example, 10
label_2
groundwater_example, 10

meta_data
groundwater_example, 10
multirun_enabled
skdaccess::astro::kepler::data_fetcher::DataFetcher, 82
skdaccess::framework::data_class::DataFetcher↩ Base, 97
skdaccess::framework::data_class::DataFetcher↩ Cache, 100
skdaccess::framework::data_class::DataFetcher↩ Local, 103
skdaccess::framework::data_class::DataFetcher↩ Storage, 107
skdaccess::framework::data_class::DataFetcher↩ Stream, 110
skdaccess::geo::gldas::data_fetcher::DataFetcher, 68
skdaccess::geo::grace::data_fetcher::DataFetcher, 72
skdaccess::geo::groundwater::data_fetcher::Data↩ Fetcher, 76
skdaccess::geo::mahali::data_fetcher::DataFetcher, 86
skdaccess::geo::modis::cache::data_fetcher::Data↩ Fetcher, 92
skdaccess::geo::modis::stream::data_fetcher::↩ DataFetcher, 56
skdaccess::geo::pbo::data_fetcher::DataFetcher, 62

normalize
skdaccess::utilities::kepler_util, 19

nostab_sys
skdaccess::utilities::pbo_util, 28

output
skdaccess::astro::kepler::data_fetcher::DataFetcher, 82
skdaccess::framework::data_class::DataFetcher↩ Base, 97
skdaccess::framework::data_class::DataFetcher↩ Cache, 101
skdaccess::framework::data_class::DataFetcher↩ Local, 104
skdaccess::framework::data_class::DataFetcher↩ Storage, 107
skdaccess::framework::data_class::DataFetcher↩ Stream, 110
skdaccess::geo::gldas::data_fetcher::DataFetcher, 68
skdaccess::geo::grace::data_fetcher::DataFetcher, 72
skdaccess::geo::groundwater::data_fetcher::Data↩ Fetcher, 77
skdaccess::geo::mahali::data_fetcher::DataFetcher, 86
skdaccess::geo::modis::cache::data_fetcher::Data↩ Fetcher, 92
skdaccess::geo::modis::stream::data_fetcher::↩ DataFetcher, 56
skdaccess::geo::pbo::data_fetcher::DataFetcher, 62

perturb
skdaccess::astro::kepler::data_fetcher::DataFetcher, 82
skdaccess::framework::data_class::DataFetcher↩ Base, 98
skdaccess::framework::data_class::DataFetcher↩ Cache, 101
skdaccess::framework::data_class::DataFetcher↩ Local, 104
skdaccess::framework::data_class::DataFetcher↩ Storage, 107
skdaccess::framework::data_class::DataFetcher↩ Stream, 110
skdaccess::framework::param_class::AutoList, 33
skdaccess::framework::param_class::AutoListCycle, 37
skdaccess::framework::param_class::AutoList↩ Permute, 39
skdaccess::framework::param_class::AutoList↩ Remove, 43
skdaccess::framework::param_class::AutoList↩ Subset, 46
skdaccess::framework::param_class::AutoParam, 48
skdaccess::framework::param_class::AutoParamList, 50

skdaccess::framework::param_class::AutoParam↩ ListCycle, 51
skdaccess::framework::param_class::AutoParam↩ MinMax, 53
skdaccess::geo::gldas::data_fetcher::DataFetcher, 68
skdaccess::geo::grace::data_fetcher::DataFetcher, 72
skdaccess::geo::groundwater::data_fetcher::Data↩ Fetcher, 77
skdaccess::geo::mahali::data_fetcher::DataFetcher, 87
skdaccess::geo::modis::cache::data_fetcher::Data↩ Fetcher, 92
skdaccess::geo::modis::stream::data_fetcher::↩ DataFetcher, 56
skdaccess::geo::pbo::data_fetcher::DataFetcher, 63
propagateErrors
skdaccess::utilities::pbo_util, 28

read_grace_data
skdaccess::utilities::grace_util, 18
readMODISData
skdaccess::utilities::modis_util, 26
removeAntennaOffset
skdaccess::utilities::pbo_util, 28
removeFrames
skdaccess::framework::data_class::TableWrapper, 133
rescale
skdaccess::utilities::modis_util, 26
reset
skdaccess::astro::kepler::data_fetcher::DataFetcher, 83
skdaccess::framework::data_class::DataFetcher↩ Base, 98
skdaccess::framework::data_class::DataFetcher↩ Cache, 101
skdaccess::framework::data_class::DataFetcher↩ Local, 104
skdaccess::framework::data_class::DataFetcher↩ Storage, 108
skdaccess::framework::data_class::DataFetcher↩ Stream, 110
skdaccess::framework::data_class::DataWrapper↩ Base, 116
skdaccess::framework::data_class::ImageWrapper, 118
skdaccess::framework::data_class::SeriesDictionary↩ Wrapper, 125
skdaccess::framework::data_class::SeriesWrapper, 128
skdaccess::framework::data_class::TableWrapper, 133
skdaccess::framework::param_class::AutoList, 33
skdaccess::framework::param_class::AutoListCycle, 37
skdaccess::framework::param_class::AutoList↩ Permute, 40
skdaccess::framework::param_class::AutoList↩ Remove, 43
skdaccess::framework::param_class::AutoList↩ Subset, 46
skdaccess::framework::param_class::AutoParam, 48
skdaccess::framework::param_class::AutoParamList, 50
skdaccess::framework::param_class::AutoParam↩ ListCycle, 52
skdaccess::framework::param_class::AutoParam↩ MinMax, 54
skdaccess::geo::gldas::data_fetcher::DataFetcher, 68
skdaccess::geo::grace::data_fetcher::DataFetcher, 73
skdaccess::geo::groundwater::data_fetcher::Data↩ Fetcher, 77
skdaccess::geo::mahali::data_fetcher::DataFetcher, 87
skdaccess::geo::mahali::data_wrapper::Data↩ Wrapper, 113
skdaccess::geo::modis::cache::data_fetcher::Data↩ Fetcher, 93
skdaccess::geo::modis::stream::data_fetcher::↩ DataFetcher, 57
skdaccess::geo::pbo::data_fetcher::DataFetcher, 63
retrieveOnlineData
skdaccess::framework::data_class::DataFetcher↩ Stream, 110
skdaccess::geo::modis::stream::data_fetcher::↩ DataFetcher, 57

sanitize_latlon
skdaccess::utilities::map_util, 21
setDataLocation
skdaccess::astro::kepler::data_fetcher::DataFetcher, 83
skdaccess::framework::data_class::DataFetcher↩ Cache, 101
skdaccess::framework::data_class::DataFetcher↩ Local, 104
skdaccess::framework::data_class::DataFetcher↩ Storage, 108
skdaccess::geo::gldas::data_fetcher::DataFetcher, 69
skdaccess::geo::grace::data_fetcher::DataFetcher, 73
skdaccess::geo::groundwater::data_fetcher::Data↩ Fetcher, 77

skdaccess::geo::mahali::data_fetcher::DataFetcher, 87
skdaccess::geo::modis::cache::data_fetcher::Data↩ Fetcher, 93
skdaccess::geo::pbo::data_fetcher::DataFetcher, 63
setStationList
skdaccess::geo::pbo::data_fetcher::DataFetcher, 63
skdaccess, 10
skdaccess.astro, 11
skdaccess.astro.kepler, 11
skdaccess.astro.kepler.data_fetcher, 11
skdaccess.astro.kepler.DataFetcher, 79
skdaccess.bin, 11
skdaccess.bin.skdaccess, 11
skdaccess.framework, 12
skdaccess.framework.data_class, 12
skdaccess.framework.data_class.DataFetcherBase, 96
skdaccess.framework.data_class.DataFetcherCache, 98
skdaccess.framework.data_class.DataFetcherLocal, 102
skdaccess.framework.data_class.DataFetcherStorage, 105
skdaccess.framework.data_class.DataFetcherStream, 109
skdaccess.framework.data_class.DataWrapperBase, 114
skdaccess.framework.data_class.ImageWrapper, 116
skdaccess.framework.data_class.SeriesDictionary↩ Wrapper, 123
skdaccess.framework.data_class.SeriesWrapper, 126
skdaccess.framework.data_class.TableWrapper, 129
skdaccess.framework.param_class, 12
skdaccess.framework.param_class.AutoList, 31
skdaccess.framework.param_class.AutoListCycle, 34
skdaccess.framework.param_class.AutoListPermute, 37
skdaccess.framework.param_class.AutoListRemove, 40
skdaccess.framework.param_class.AutoListSubset, 44
skdaccess.framework.param_class.AutoParam, 46
skdaccess.framework.param_class.AutoParamList, 48
skdaccess.framework.param_class.AutoParamListCycle, 50
skdaccess.framework.param_class.AutoParamMinMax, 52
skdaccess.geo, 12
skdaccess.geo.gldas, 13
skdaccess.geo.gldas.data_fetcher, 13
skdaccess.geo.gldas.DataFetcher, 65
skdaccess.geo.grace, 13
skdaccess.geo.grace.data_fetcher, 13
skdaccess.geo.grace.DataFetcher, 69
skdaccess.geo.groundwater, 13
skdaccess.geo.groundwater.data_fetcher, 13
skdaccess.geo.groundwater.DataFetcher, 74
skdaccess.geo.mahali, 14
skdaccess.geo.mahali.data_fetcher, 14
skdaccess.geo.mahali.data_wrapper, 14
skdaccess.geo.mahali.data_wrapper.DataWrapper, 111
skdaccess.geo.mahali.DataFetcher, 84
skdaccess.geo.modis, 14
skdaccess.geo.modis.cache, 14
skdaccess.geo.modis.cache.cloud_mask, 14
skdaccess.geo.modis.cache.cloud_mask.data_fetcher, 15
skdaccess.geo.modis.cache.cloud_mask.DataFetcher, 88
skdaccess.geo.modis.cache.cloud_opacity, 15
skdaccess.geo.modis.cache.cloud_opacity.data_fetcher, 15
skdaccess.geo.modis.cache.cloud_opacity.DataFetcher, 64
skdaccess.geo.modis.cache.data_fetcher, 15
skdaccess.geo.modis.cache.DataFetcher, 89
skdaccess.geo.modis.cache.reflectance, 15
skdaccess.geo.modis.cache.reflectance.data_fetcher, 15
skdaccess.geo.modis.cache.reflectance.DataFetcher, 94
skdaccess.geo.modis.stream, 16
skdaccess.geo.modis.stream.cloud_mask, 16
skdaccess.geo.modis.stream.cloud_mask.data_fetcher, 16
skdaccess.geo.modis.stream.cloud_mask.DataFetcher, 95
skdaccess.geo.modis.stream.cloud_opacity, 16
skdaccess.geo.modis.stream.cloud_opacity.data_fetcher, 16
skdaccess.geo.modis.stream.cloud_opacity.DataFetcher, 78
skdaccess.geo.modis.stream.data_fetcher, 16
skdaccess.geo.modis.stream.DataFetcher, 54
skdaccess.geo.modis.stream.reflectance, 17
skdaccess.geo.modis.stream.reflectance.data_fetcher, 17
skdaccess.geo.modis.stream.reflectance.DataFetcher, 58
skdaccess.geo.pbo, 17
skdaccess.geo.pbo.data_fetcher, 17
skdaccess.geo.pbo.DataFetcher, 59
skdaccess.utilities, 17
skdaccess.utilities.grace_util, 17
skdaccess.utilities.gw_util, 19
skdaccess.utilities.kepler_util, 19
skdaccess.utilities.map_util, 20
skdaccess.utilities.map_util.Planet, 121
skdaccess.utilities.modis_util, 22
skdaccess.utilities.modis_util.LatLon, 119
skdaccess.utilities.pbo_util, 27
skdaccess::astro::kepler::data_fetcher::DataFetcher
__init__, 80
__str__, 80
cacheData, 80
downloadKeplerData, 81
getConfig, 81
getDataLocation, 81
getMetadata, 82
multirun_enabled, 82

output, 82
perturb, 82
reset, 83
setDataLocation, 83
writeConfig, 83
skdaccess::bin::skdaccess
skdaccess_script, 11
skdaccess::framework::data_class::DataFetcherBase
__init__, 96
__str__, 97
getConfig, 97
getMetadata, 97
multirun_enabled, 97
output, 97
perturb, 98
reset, 98
writeConfig, 98
skdaccess::framework::data_class::DataFetcherCache
__str__, 99
cacheData, 99
getConfig, 100
getDataLocation, 100
getMetadata, 100
multirun_enabled, 100
output, 101
perturb, 101
reset, 101
setDataLocation, 101
writeConfig, 102
skdaccess::framework::data_class::DataFetcherLocal
__str__, 103
getConfig, 103
getDataLocation, 103
getMetadata, 103
multirun_enabled, 103
output, 104
perturb, 104
reset, 104
setDataLocation, 104
writeConfig, 105
skdaccess::framework::data_class::DataFetcherStorage
__str__, 106
downloadFullDataset, 106
getConfig, 106
getDataLocation, 106
getMetadata, 107
multirun_enabled, 107
output, 107
perturb, 107
reset, 108
setDataLocation, 108
writeConfig, 108
skdaccess::framework::data_class::DataFetcherStream
__str__, 109
getConfig, 109
getMetadata, 109
multirun_enabled, 110
output, 110
perturb, 110
reset, 110
retrieveOnlineData, 110
writeConfig, 111
skdaccess::framework::data_class::DataWrapperBase
__init__, 114
addResult, 115
get, 115
getIterator, 115
getResults, 115
info, 115
reset, 116
update, 116
skdaccess::framework::data_class::ImageWrapper
addResult, 117
deleteData, 117
get, 117
getIterator, 118
getResults, 118
info, 118
reset, 118
update, 119
updateData, 119
skdaccess::framework::data_class::SeriesDictionary↩
Wrapper
addResult, 123
get, 124
getIndices, 124
getIterator, 124
getLength, 124
getResults, 124
info, 125
reset, 125
update, 125
skdaccess::framework::data_class::SeriesWrapper
__init__, 126
addResult, 127
get, 127
getIndices, 127
getIterator, 127
getLength, 128
getResults, 128
info, 128
reset, 128
update, 129
skdaccess::framework::data_class::TableWrapper
__init__, 130
addColumn, 130
addResult, 131
get, 131

getDefaultColumns, 131
getDefaultErrorColumns, 131
getIterator, 132
getLength, 132
getResults, 132
info, 132
removeFrames, 133
reset, 133
update, 133
updateData, 133
updateFrames, 134
skdaccess::framework::param_class::AutoList
__call__, 32
__getitem__, 32
__init__, 31
__len__, 32
__setitem__, 32
__str__, 33
getAllOptions, 33
perturb, 33
reset, 33
val, 34
skdaccess::framework::param_class::AutoListCycle
__call__, 35
__getitem__, 35
__init__, 35
__len__, 36
__setitem__, 36
__str__, 36
getAllOptions, 36
perturb, 37
reset, 37
val, 37
skdaccess::framework::param_class::AutoListPermute
__call__, 38
__getitem__, 38
__len__, 38
__setitem__, 39
__str__, 39
getAllOptions, 39
perturb, 39
reset, 40
val, 40
skdaccess::framework::param_class::AutoListRemove
__call__, 41
__getitem__, 41
__init__, 41
__len__, 42
__setitem__, 42
__str__, 42
getAllOptions, 43
perturb, 43
reset, 43
val, 43
skdaccess::framework::param_class::AutoListSubset
__call__, 44
__getitem__, 44
__len__, 45
__setitem__, 45
__str__, 45
getAllOptions, 45
perturb, 46
reset, 46
val, 46
skdaccess::framework::param_class::AutoParam
__call__, 47
__init__, 47
__str__, 47
perturb, 48
reset, 48
skdaccess::framework::param_class::AutoParamList
__call__, 49
__init__, 49
__str__, 49
perturb, 50
reset, 50
skdaccess::framework::param_class::AutoParamListCycle
__call__, 51
__init__, 51
__str__, 51
perturb, 51
reset, 52
skdaccess::framework::param_class::AutoParamMinMax
__call__, 53
__init__, 53
__str__, 53
perturb, 53
reset, 54
skdaccess::geo::gldas::data_fetcher::DataFetcher
__init__, 66
__str__, 66
downloadFullDataset, 67
getConfig, 67
getDataLocation, 67
getMetadata, 68
multirun_enabled, 68
output, 68
perturb, 68
reset, 68
setDataLocation, 69
writeConfig, 69
skdaccess::geo::grace::data_fetcher::DataFetcher
__init__, 70
__str__, 71
downloadFullDataset, 71
getConfig, 71
getDataLocation, 71
getMetadata, 72

multirun_enabled, 72
output, 72
perturb, 72
reset, 73
setDataLocation, 73
writeConfig, 73
skdaccess::geo::groundwater::data_fetcher::DataFetcher
__init__, 74
__str__, 75
downloadFullDataset, 75
getConfig, 75
getDataLocation, 76
getMetadata, 76
getStationMetadata, 76
multirun_enabled, 76
output, 77
perturb, 77
reset, 77
setDataLocation, 77
writeConfig, 78
skdaccess::geo::mahali::data_fetcher::DataFetcher
__init__, 84
__str__, 85
cacheData, 85
getConfig, 85
getDataLocation, 86
getMetadata, 86
multirun_enabled, 86
output, 86
perturb, 87
reset, 87
setDataLocation, 87
writeConfig, 87
skdaccess::geo::mahali::data_wrapper::DataWrapper
addResult, 112
get, 112
getIterator, 112
getResults, 112
info, 113
reset, 113
update, 113
skdaccess::geo::modis::cache::cloud_mask::data_↩
fetcher::DataFetcher
__init__, 88
skdaccess::geo::modis::cache::cloud_opacity::data_↩
fetcher::DataFetcher
__init__, 65
skdaccess::geo::modis::cache::data_fetcher::DataFetcher
__init__, 90
__str__, 90
cacheData, 90
find_data, 91
getConfig, 91
getDataLocation, 91
getMetadata, 92
multirun_enabled, 92
output, 92
perturb, 92
reset, 93
setDataLocation, 93
writeConfig, 93
skdaccess::geo::modis::cache::reflectance::data_↩
fetcher::DataFetcher
__init__, 94
skdaccess::geo::modis::stream::cloud_mask::data_↩
fetcher::DataFetcher
__init__, 95
skdaccess::geo::modis::stream::cloud_opacity::data_↩
fetcher::DataFetcher
__init__, 79
skdaccess::geo::modis::stream::data_fetcher::Data↩
Fetcher
__init__, 55
__str__, 55
getConfig, 55
getMetadata, 56
multirun_enabled, 56
output, 56
perturb, 56
reset, 57
retrieveOnlineData, 57
writeConfig, 57
skdaccess::geo::modis::stream::reflectance::data_↩
fetcher::DataFetcher
__init__, 58
skdaccess::geo::pbo::data_fetcher::DataFetcher
__init__, 60
__str__, 60
downloadFullDataset, 60
getAntennaLogs, 61
getConfig, 61
getDataLocation, 61
getInfo, 62
getMetadata, 62
getStationMetadata, 62
multirun_enabled, 62
output, 62
perturb, 63
reset, 63
setDataLocation, 63
setStationList, 63
writeConfig, 64
skdaccess::utilities::grace_util
average_dates, 18
compute_ewd, 18
dateMismatch, 18
read_grace_data, 18
skdaccess::utilities::gw_util

combine_water_heights, 19
skdaccess::utilities::kepler_util
normalize, 19
skdaccess::utilities::map_util
calc_slopes, 20
global_coords, 21
gps2pixel, 21
sanitize_latlon, 21
trim_map, 21
wgs84_distance, 22
skdaccess::utilities::map_util::Planet
__init__, 121
get_lateraldist, 122
get_lateraldist_array, 122
get_medialdist, 122
skdaccess::utilities::modis_util
calibrateModis, 23
checkBit, 23
createGrid, 23
getFileIDs, 24
getFileURLs, 24
getImageType, 24
getModisData, 25
gps2pixel, 25
readMODISData, 26
rescale, 26
skdaccess::utilities::modis_util::LatLon
__call__, 120
__init__, 120
skdaccess::utilities::pbo_util
getLatLonRange, 27
getROIstations, 27
getStationCoords, 27
nostab_sys, 28
propagateErrors, 28
removeAntennaOffset, 28
stab_sys, 29
skdaccess_script
skdaccess::bin::skdaccess, 11
stab_sys
skdaccess::utilities::pbo_util, 29

trim_map
skdaccess::utilities::map_util, 21

update
skdaccess::framework::data_class::DataWrapper↩ Base, 116
skdaccess::framework::data_class::ImageWrapper, 119
skdaccess::framework::data_class::SeriesDictionary↩ Wrapper, 125
skdaccess::framework::data_class::SeriesWrapper, 129
skdaccess::framework::data_class::TableWrapper, 133
skdaccess::geo::mahali::data_wrapper::Data↩ Wrapper, 113
updateData
skdaccess::framework::data_class::ImageWrapper, 119
skdaccess::framework::data_class::TableWrapper, 133
updateFrames
skdaccess::framework::data_class::TableWrapper, 134
utilities/grace_util.py, 140
utilities/gw_util.py, 141
utilities/kepler_util.py, 141
utilities/map_util.py, 141
utilities/modis_util.py, 142
utilities/pbo_util.py, 142

val
skdaccess::framework::param_class::AutoList, 34
skdaccess::framework::param_class::AutoListCycle, 37
skdaccess::framework::param_class::AutoList↩ Permute, 40
skdaccess::framework::param_class::AutoList↩ Remove, 43
skdaccess::framework::param_class::AutoList↩ Subset, 46

wgs84_distance
skdaccess::utilities::map_util, 22
writeConfig
skdaccess::astro::kepler::data_fetcher::DataFetcher, 83
skdaccess::framework::data_class::DataFetcher↩ Base, 98
skdaccess::framework::data_class::DataFetcher↩ Cache, 102
skdaccess::framework::data_class::DataFetcher↩ Local, 105
skdaccess::framework::data_class::DataFetcher↩ Storage, 108
skdaccess::framework::data_class::DataFetcher↩ Stream, 111
skdaccess::geo::gldas::data_fetcher::DataFetcher, 69
skdaccess::geo::grace::data_fetcher::DataFetcher, 73
skdaccess::geo::groundwater::data_fetcher::Data↩ Fetcher, 78
skdaccess::geo::mahali::data_fetcher::DataFetcher, 87
skdaccess::geo::modis::cache::data_fetcher::Data↩ Fetcher, 93

skdaccess::geo::modis::stream::data_fetcher::↩
DataFetcher, 57
skdaccess::geo::pbo::data_fetcher::DataFetcher, 64