

Getting Started with the Command-Line API

Local Data Import

- **imp_ascii()**: imports data from a simple text file (min. header, no missing value codes)
- **imp_filter()**: imports data from a text file with missing value codes, large headers
- **imp_matlab()**: imports data from MATLAB file or workspace variables (numeric, char and cell array variables)
- **imp_struct()**: imports data from a MATLAB structure in a file or workspace variable
- **imp_campbell_toa5(), parse_seabird(), imp_csi_array(),...**: logger-specific import filters
- **batch_import()**: imports all or selected files in a directory using a specified import filter

Network Data Import

- **fetch_usgs()**: retrieves instantaneous or daily data for a USGS station
- **fetch_ncdc_ghcnd()**: retrieves climate data from NOAA for GHCN stations
- **fetch_noaa_hads()**: retrieves data from the NOAA Hydro-meteorological Automated Data system
- **fetch_climdb_data()**: retrieves data from ClimDB
- **fetch_eml_data()**: retrieves EML-- •]described data tables from the NIS or Metacat
- **sql2gceds()**: retrieves data and attribute metadata from an SQL database via JDBC (MATLAB Database Toolbox required)

Data Export

- **extract()**: extracts data arrays from a structure into the base MATLAB workspace
- **exp_ascii()**: exports data and metadata to a delimited text file
- **exp_matlab()**: exports data and metadata to a MATLAB file as standard arrays or matrices
- **gceds2struct()**: generates a scalar or multi-dimensional structure from a GCE Data Structure with fields for each variable and associated flags
- **gceds2eml()**: generates a delimited text data file and accompanying Ecological Metadata Language metadata document for archiving
- **gceds2kml()**: generates a Google Earth Keyhole Markup Language file from a geo-referenced GCE Data Structure, with record values in popup balloons
- **gceds2html()**: generates an HTML table from columns in a GCE Data Structure for web display

Creating and Updating Data Structures

- **newstruct()**: creates an empty data structure
- **addcol()**: adds a data array to a structure as a new column
- **add_calcexpr()**: adds a derived column based on a mathematical expression
- **copycols/copyrows()**: copies or re-- •]orders columns or rows in a data structure, resp.

- **insertrows()**: inserts rows into specified columns of a data structure

Manipulating Data Structures

- **update_data()**: update values in a data column with a new array, logging value changes
- **deletecols()**: deletes one or more columns in a data structure
- **deleterows()**: deletes one or more rows in a data structure
- **querydata()**: filters data based on a criteria expression (e.g. Salinity<30&Temp_Air>10)
- **sortdata()**: sorts rows based on values in one or more data columns
- **unit_convert()**: converts column units based on pre-defined conversions or an equation
- **pad_date_gaps()**: fills in missing date/time records to generate a uniform time-series
- **shift_datetime()**: adjusts dates and times by a specified data part and interval
- **convert_date_format()**: converts date values between various numeric and text formats

Structure Information and Metadata Functions

- **listcols()**: lists all columns, including index number, units and data type
- **listhist()**: displays the processing history (lineage) as formatted text
- **num_records()**: lists the number of data rows in a data structure
- **listmeta()**: generates formatted metadata in various styles (text and XML)
- **lookupmeta()**: retrieves a metadata entry for a specified section and field name
- **addmeta()**: adds or updates metadata based on an array of sections, fields and values

QA/QC Functions

- **dataflag()**: updates Q/C flags based on rules in metadata (generally automatic)
- **copyflags()**: copies flags from one or more columns to specified dependent columns
- **flags2cols()**: instantiates Q/C flags as text columns (e.g. for text file export)
- **cols2flags()**: creates Q/C flags from text columns (e.g. importing predefined flags)
- **nullflags()**: converts flagged values to NaN/empty (any or selected)
- **cullflags()**: deletes rows with flagged values (any or selected)
- **flag_locks()**: locks or unlocks flag rules to prevent or restore automatic flagging, resp.

Statistical Summary and Re-sampling Functions

- **aggr_stats()**: aggregates data and calculate stats for specified columns
- **aggr_datetime()**: aggregates data by date intervals and calculates stats
- **aggr_bindata()**: aggregates data and bins by intervals of a specified column
- **viewstats()**: displays a statistical summary in a scrollable text box

Plotting Functions

- **plotdata()**: generates line/symbol plots
- **plotgroups()**: generates line/symbol plots for 1 variable split into groups by value

- **dateplot2html(), dateplot2template(), dateplot2xml():** generates date interval plots for the web with index pages of captioned thumbnails
- **monthticks(), yearticks():** sets the X-axis date range to even months/years and generates precisely monthly or yearly tick marks for time series plots

Data Integration Functions

- **datamerge():** merges (concatenates) two data structures, automatically aligning columns
- **merge_by_date():** merges two data structures by date, trimming overlapping dates
- **multimerge():** merges multiple data structure files
- **joindata():** joins two data structures based on common key values