Ocean Data View Development History

Reiner Schlitzer, Alfred-Wegener-Institute, Bremerhaven, GERMANY (Reiner.Schlitzer@awi.de)

ODV Release 5.8.0 (Windows, macOS, Linux) Jan/26/2025:

- New native version for Windows on Arm systems (installation package name: *odv_<version>_win_arm64.exe*).
- Support for dark mode added. Values in the list windows on the right are now shown in light colors and clearly visible.
- Quality flag mappings from ODV to QUARTOD scheme corrected.
- New string valued derived variable DRVDVART::ISODATETIME *ISO Date Time (time variable*.
- Axis range synchronization between different data windows is now a property of the view. Use the new *View > View Properties* option to switch this feature on or off.
- Axis range synchronization of parent and overlay windows can now be switched off.
- New *Clipboard Copy* menu option when right-clicking on meta- or data variable values in the list windows copies the respective value to the clipboard.
- SCATTER windows do no longer load data if a certain limit on the number of data points is exceeded. The default maximum data count is 250,000,000. Users can overwrite this value via *View > Settings > View > Data Count Limit*.
- Ranges of *Day of Year* axis of data windows can now exceed the [0, 365] interval. Shifted data will be added in the extended parts. This is useful when calculating fitted curves. Once the fitted curves are calculated and shown in the data window, the ranges can be restored to [0, 365].
- The Spreadsheet and SeaDataNet importers no longer break stations by time tolerance if importing time series data.
- The Argo profile importer now ignores the *Pressure displacement…* variables. This reduces the size of the import collection by about 20%.
- Import of EMODnet marine litter datasets was improved by adapting the SDN importer as well as the *sdn_import_settings.xml* file.
- Collections created by the *WHP Formats* importers now have the *Cruise Information Link* meta variable instead of the *Cruise Report* meta variable. The *Cruise Information Link* values are clickable links and open the respective CCHDO cruise page in the web browser. Links to cruise reports are available on the CCHDO cruise pages. Pdf documents found in the input data directory are no longer packaged into the import collection.
- The Z-label of overlay windows is now placed just above the Z-label of the parent window.
- Contours exported as graphics objects via *Extras > Export as Graphics Object > Contour Lines* are now properly clipped.
- The SDN harmonization settings file was extended and includes more contaminants.
- *PostScript (*.eps)* no longer supported as graphics output format.

BUG FIXES

- Fixed occasional misplacement of vertical color bar.
- SeaDataNet *EventEndDateTime* variable now properly converted from ISO date/time to decimal year.
- When opening netcdf files, attributes of type NC_STRING are now read correctly.
- Fixed issue when loaded *DiffReference* derived variables from view.
- Fixed numerous issues with the o4x importer. O4x files can now be dropped onto ODV.
- Fixed issue when deleting overlay windows.
- Fixed issues when deleting derived variables used in isosurface variables.

ODV Release 5.7.2 (Windows, macOS, Linux) Jul/11/2024:

- When opening a collection, ODV now verifies that all quality flag schemas of meta and data variables are supported by the current ODV software version.
- Quality flag inheritance is now implemented for string derived variables, such as AGGREGATEDVAR and SDNAGGREGATEDVAR.
- Numeric metadata values in ODV spreadsheet exports and on metadata edit dialog now shown with 3 extra digits.
- Column separator can now be selected by user when exporting data to spreadsheet file.
- Current versions of the P35 vocabulary as well as the unit conversion database are downloaded each time the *Export > Data > SDN Aggregated Collection* option is invoked.

BUG FIXES

- Drawing of error bars in STATION windows enabled again.
- *SDN Transposed Spreadsheet File* export now lists *Sample Identifier* and *Subsample Identifier* values in separate columns. Numeric metadata values now shown with 3 extra digits.
- Fixed problem with shapefile graphics objects not being drawn occasionally.
- Fixed occasional crashes when exporting data to netCDF file.

ODV Release 5.7.1 (Windows, macOS, Linux) Apr/29/2024:

- Criteria for detection of CORA data files relaxed. Now only global attribute *:format_version = "3.3"* is required. Now also imports data if DEPH variable is present

but does not contain data. In such cases values from PRES are used and converted to depth on-the-fly.

- Added flag "0" to the WOCEBOTTLE flagging scheme. This flag is a GLODAP extension (https://doi.org/10.5194/essd-2023-468), but is not used by WOCE.
- Range and polygon sample filters can now be applied when exporting data to an ODV spreadsheet file.

BUG FIXES

- The *Exclude outliers* feature based on deviations from gridded field values is no longer applied if display style is *Original data*. This fixes rare *mysterious disappearance* of data points in plots.
- Fixed issue with wrong quality flag propagation for derived variables that tolerate input variables without data, such as aggregated variables, carbon system parameters, or expressions.
- Crash when switching-on a Gazetteer fixed.

ODV Release 5.7.0 (Windows, macOS, Linux) Feb/05/2024:

- Changes of the map and data window layout is now possible via "View > Layout" or the new "Layout" sub-menus in the canvas, map and data window context menus. The separate Layout Mode is removed.
- Handling of overlay windows was revised to ensure proper geometry and axis range synchronization between parent and overlay data windows.
- New option Alt-right-click on top of an overlay window now provides the context menu of the underlying parent window.
- New Ctrl-right-click and Shft-right-click shortcuts for directly accessing the Layout and Extras context sub-menus of the parent   element.
- Shortcut key for loading views changed from "Shift+L" to "Ctrl+V".
- Colorbar placement is now based on the window's bounding box to avoid collisions with axis annotations.
- New SPIKINESS derived variable.
- New default xgob file format for graphics objects files. The old   gob format is still supported for backwards compatibility.
- New default xsec file format for section files. The old sec format is still supported for backwards compatibility.
- Acceptable salinity input value upper limit for calculation of derived variable values increased to 90 psu.

BUG FIXES

- DIVA "Domain selection – Section" was not working properly.

ODV Release 5.6.7 (Windows, macOS, Linux) Oct/25/2023:

BUG FIXES

- Crash when creating interrupted map of the station map.

ODV Release 5.6.6 (Windows, macOS, Linux) Oct/23/2023:

- Sample filters of data windows now allow filtering by user-defined X/Y polygon. Option "Sample Filter > Reject Outliers" now leaves any existing range or polygon filer intact.
- Separate context menus now show up in the "Current Station" list window depending on whether the right-click is on the meta variable labels (left) or values (right).
- New submenu "Assign Quality Flag" when right-clicking on a meta variable value, allowing to set the quality flag for this meta variable for the current station, all stations shown in the map or all stations in the collection.
- Option "Tools > Other Collection > Inherit View File(s)" now also handles isosurface variables and their sample filter.
- Calculation of isosurface variable values now more than a factor of 2 faster due to multithreading. TEOS-10 is now threadsafe.
- Revision of the set of palettes shipped with ODV. Addition of many popular community palettes. Palette preview images are now shown in the palette selection dialog elements.
- New gridded bathymetry data based on GEBCO 2023 are now available via "View > Settings > Gridded Bathymetry > Resources" or "odv > Settings > Gridded Bathymetry > Resources" on macOS.
- New map resources based on GEBCO 2023 are now available via "View > Settings > Map > Resources" or "odv > Settings > Map > Resources" on macOS.
- Variable names in netCDF export files now are the same as the meta and data variable names of the source collection, where possible.
- The tables produced by the "Collect Unique Values" and "Data Availabilty" options can now be re-sorted by clicking on the header label of an arbitrary column. Clicking again reverses the order.
- Export to SDN Transposed File now allows customization of longitude values ([0 - 360] versus [-180 - 180]) and time series data primary variable values (decimal value versus ISO8601 date, such as 2017-04-25T13:09:45).

BUG FIXES

- Installation problems of support files for SDN Aggregation, SDN Harmonization and SDN Transposition fixed.
- The SDN importer now correctly handles cases when parameter names only differ by case, e.g. Ptot and PTOT.
- Rare crashes when calculating isosurface variable values for collections with very large sample counts, e.g, GHCN-daily_v3.26.
- Crashes when defining non-map SURFACE data windows.

ODV Release 5.6.5 (Windows, macOS, Linux) May/04/2023:

- Option "Export > Data > SDN Aggregated ODV Collection" now works properly after updating the P35 vocabulary reader.

ODV Release 5.6.4 (Windows, macOS, Linux) Apr/25/2023:

- Derived variables now use the quality flag scheme of the input   variables if all input variables use the same scheme. Otherwise, the ODV quality flag scheme is used.
- Aggregated and Converted derived variables can now convert temperature between degrees Celcius and Kelvin.
- SDN harmonized variables now contain the P01 code id as part of their name.
- CORA importer updated to accept spring 2023 version of CORA 5.2 files.
- ARGO quality flagging scheme: added flag 6 (value below detection). This is not officially part of the Argo flagging scheme but used by   CORA.
- SMHI quality flagging scheme changed on request of SMHI: ! > E; ? > S; | > R; C removed.
- The data edit history log records now include the sample IDs for   easier sample identification.
- Support for collection info files in pdf format added. If file   "info.pdf" exists it is preferred over the text-only "info" file.
- Dialog layouts adapted for high-resolution screens.
- netCDF support revised and extended. setup (previously called emulation) separated from views now allowing multiple views when   working with netCDF files. Implementation of auto-setup (no NetCDF   Wizard) in batch mode environments. Implementation of setup and view templates for netCDF files with identical structure (family).
- New open_netcdf command file command.
- Command file command import_data now also works when no collection is open. One or more target collections are created automatically.

BUG FIXES

- Carbon derived variables could not be loaded from saved views and had to be re-established manually.
- Fixed occasional erroneous quality flags for "Special > Aggregated Variable" derived variable (bug introduced in ODV 5.6.3).
- Fixed bug when importing BGC-Argo UV_INTENSITY_NITRATE variable.
- Loading of timeseries data from netCDF files did not work properly.

ODV Release 5.6.3 (Windows, macOS, Linux) Sep/13/2022:

- New bathymetry and tiled map layer resources for the International Bathymetric Chart of the Southern Ocean, Version 2 (IBCSO_v2)   added.
- The spreadsheet data exporter now automatically adds enclosing   double quotes to strings containing the column separation character.
- Processing time for duplicate station identification and processing is reduced by orders of magnitude, due to a complete code re-write and implementation of several optimizations. Application to large collections with millions of stations now only takes one or two hours.
- New "Station Filter" submenu provides "Relax" and "Customize" options. The first option automatically relaxes all station filter settings and accepts all stations. Option 2 provides full control over all filter settings, as in previous ODV versions.
- The data window context menu options "Extras > 1D Estimation" and "Extras > 2D Estimation" now allow direction specification of regular grid nodes, in addition to the loading the grid nodes from a prepared file.
- The CONVERTEDVAR and AGGREGATEDVAR derived variables now use the quality flag schema of the input variables (if all input variables   use the same scheme) instead of the ODV flagging scheme used previously.
- NEW: Native arm64 ODV installation package for Apple Silicon (M1 and M2) is now available.

BUG FIXES

- Fixed bad quality flag schema assignment to WHP parameters during import of WHP data and creation of WHP collections.
- Fixed bug when samples are inserted during merging of duplicate stations.
- Fixed bugs in setup of Symbolset graphics objects. Symbolsets of data windows now honor the window's sample filter, if any.
- Fixed issue with "Automatic scale lengths" being erroneously switched on again after switching off manually.

ODV Release 5.6.2 (Windows, macOS, Linux) Apr/04/2022:

- GeoTIFF support added for "Map Statistics > X/Y Distribution" plots, e.g., station density maps. Tif files of such plots now have geo-reference information embedded, which allows using these images as layers in GIS software.
- New "MEOP netCDF" importer for MEOP marine mammals data added. This importer extracts additional meta variable values from the netCDF file's global attributes.

BUG FIXES

- Fixed crash when opening netcdf files (Windows only).
- Fixed rare issue with isosurface variables assignment on SURFACE data windows after editing and deleting isosurface variables.

ODV Release 5.6.1 (Windows) Mar/09/2022:

BUG FIXES

- Fixed issue causing crash when terminating section definition on Windows.

ODV Release 5.6.0 (Windows, macOS, Linux) Mar/04/2022:

- GeoTIFF support added. Tif images of the station map and map data plots (e.g., isosurface plots) now have geo-reference information embedded, which allows using such images as layers in GIS software.
- When exporting images for station map or data windows, ODV now lets users specify a drawing style (Normal or Pure) and choose between opaque or transparent background (except jpeg).
- The "export_graphics" command file command now has more option. For instance, users can specify a drawing_style (NORMAL or PURE), choose whether the background is tranparent (not for jpg) or opaque, and prescribe output pixel width and height of the image.ata Availability with submenu for four contexts replaces the previous Availability Information option.
- Renamed the following menu items:
  - ❖ "Export > Station Data" to "Export > Data"
  - ❖ "Export > Station Meta Data" to "Export > Meta Data"
  - ❖ "Export > Station History" to "Export > History"
- Option "Export > Window Data": when exporting estimated grid values now also exports "poor man's estimation error", with large values indicating poor estimates.
- Extended the "Export > Data > SDN Harmonized ODV Collection" option to merge multiple occurrences of the same P01/P06 combination into single parameters (no unit conversion) even if these codes are not in the harmonization input file.
- The WHP Exchange data importer now detects and corrects more non-standard parameter names and units. Also detects and corrects cases where units are shifted by one column.
- The Sea-Bird cnv importer now detects bad sample index values in "* Cast" lines and sets Up/Down cast property more reliably.

ODV Release 5.5.2 (Windows, macOS, Linux) Nov/19/2021:

❖ New flag B added to SEADATANET quality flag scheme. "The data value is a numerical data value that was the intended or targeted value rather than the measured value (e.g. instrument target depth)."

BUG FIXES

❖ Fixed bug in the ODV Spreadsheet and SeaDataNet importers causing date and time not being imported.

ODV Release 5.5.1 (Windows, macOS, Linux) Sep/06/2021:

BUG FIXES

❖ Fixed bug in the ODV Spreadsheet and SeaDataNet importers causing date and time not being imported.

ODV Release 5.5.0 (Windows, macOS, Linux) Sep/02/2021:

- Rearrangement of options in the map and data window context menus.
- The Statistics option is moved up from the Extras submenu to the map and data window context menus. For data windows the Statistics menu is split into "Summary" and "Curve Fitting" submenu options.
- The values in the metadata list window are now colored according to the meta value quality flags. Longitude and latitude values are now shown on separate lines.
- Station Filter can now filter by meta data quality.
- On the Station Filter Meta Data page you can now filter for stations not containing data for a particular numeric meta variable (put '(empty)' in the lower bound field and leave the upper bound field empty).
- New Matlab_parula palette.
- The Spreadsheet importer now honors the value-type setting of mandatory meta variables from //<MetaVariable> lines in the import file.
- The SeaDataNet importer now determines the SDN data variant of each file. Station subsampling is now only performed on standard data files with "Measuring area type" value "curve".
- The WHP Bottle importer now keeps "CTDTMP [ITS-90]", "CTDTMP [IPTS-68]", and "CTDTMP [DEG C]" as separate variables. Use the derived "Aggregated Variable" to combine the three for usage.
- The Argo profile importer now reads and uses position quality flags and maintains a proper order of data variables.
- The CORA importer now applies scale factors specified in the netCDF data files.
- Data imported with the Medatlas importer now use the SEADATANET quality flag scheme instead of GTSPP.
- The WHP Bottle exporter output files now better conform with the format specifications.
- The derived "Aggregated Variable" can now also be used with string-valued data variables.
- New URL for downloading the NERC P35 vocab implemented. This fixes recent problems with option "Export > Station Data > SDN Aggregated ODV Collection".
- Option "Export > Station Data > SDN Harmonized ODV Collection" now also handles string data variables.
- The outlier result file created by the "Tools > Find Outlier" options now contain ISO8601 dates for decimal time primary variables with name "time_ISO8601".
- Cdt file graphics objects now also work for tiled map resources.
- Isopycnic Gridding internal adjustments.

BUG FIXES

- String values are now correctly imported when importing from ODV collections.

- Fixed crash occuring with "File > New" option when using a .txt or .odv file template or user specified variables.
- Fixed wrong automatic key variable associations when importing World Ocean Database ASCII data files.

ODV Release 5.4.0 (Windows, macOS, Linux) Mar/02/2021:

- New data window display styles "Colored Dots (X Quality)", "Colored Dots (Y Quality)", and "Colored Dots (Z Quality)", which in SCATTER and SECTION plots will produce colored dots reflecting the quality flag values of the X, Y, and Z variable, respectively
- New station filtering by history record date, user, action and description (on new History page) as well as by sample count (new controls on Name / Range page).
- Data collections now have the new "Description" attribute.
- The CORA importer now accepts files with data type "Location" and with pressure data instead of depth.
- The WHP Formats importers now provide descriptions for imported data variables.
- Export from SeaDataNet collections to ODV Sreadsheet now use 9 significant digits for all numerical data values.
- ort from SeaDataNet collections to SDN Harmonized ODV Collection now uses the P01 altLabel as harmonized variable names instead of column labels found in the data files. The lists of "Parameters" and "UnitConversions" in file "sdn_harmonization_settings.xml" has been extended.
- Export from SeaDataNet collections to SDN Transposed Spreadsheet now contains three additional columns "Sample identifier", "Subsample identifier", and "ODV internal sample number". The list of not transposed variables is written to a log file and can be viewd by clicking on "Details" on the final summary dialog.
- The "P01 Codes in Originator File" meta variable in SDN import data collections was renamed to "Codes in Originator File" and now contains P06 units codes, in addition to P01 parameter codes.
- The meta variable "P35 Contributor Codes" created during "Export > Station Data > SDN Aggregated ODV Collection" now contains P06 units codes, in addition to P01 parameter codes.
- When importing SDN data files or SDN data collections into a SDN data collection and "Check for existing stations" on the "Import Options" dialog is checked, the algorithm for finding existing matching stations now takes into account the data version. Existing stations with a version lower or equal to the version of the import station are overwritten.
- When importing SDN data files, exporting as SDN Aggregated ODV Collection, or exporting as SDN Harmonized ODV Collection you can now obtain lists of data variables with descriptions via "Collection > Browse Info File" in the resulting collections.
- The //<DataVariable> lines in ODV spreadsheet files can now contain the "key_variable" field to specify the key variable for this variable.
- "Collection > Properties > Meta Variables" option now allows moving non-mandatory meta variables up and down.
- Changed default quality flag of the WOCECTD scheme to "1" "not calibrated" from "2" "acceptable measurement" previously.

- The Properties dialog for metadata variables now lets you modify the type of the variable.
- New auto-function in ODV annotations "=software()" showing ODV software name and version.
- CDF emulator now supports nc files with more than 2 billion grid points.

BUG FIXES

- Fixed problem with station data export to netCDF (would export longitude values as [0 to 360], even if [-180 to 180] was requested.
- Application window geometry issues on multi-screen systems fixed.
- Fixed problem with inheriting views from other collections containing derived variables and/or Expressions.
- Fixed problem with not exporting all data to SDN Transposed Spreadsheet output.
- The Collection importer now correctly imports values of data variables named "time_ISO8601".

ODV Release 5.3.0 (Windows, macOS, Linux) Jun/03/2020:

- The station filter now allows filtering for empty and not empty meta data strings using the terms "(empty)" and "(!empty)".
- Option "Collect String Values" renamed to "Collect Unique Values". Now can be also used for integer type variables. The results now also reveal the number of empty values. Results are shown directly in table dialog; clipboard copy is still possible.
- ting "Map Properties > Display Style > Dot size" to -1 makes ODV determine dot sizes automatically.
- "Export > Window Data" allows exporting of map and data window's X, Y, Z data to file. Previous "X, Y, Z Window Data" option is removed.
- "NOAA NCEI Formats > GTSPP" importer now supports the MEDS-ASCII format, in addition to netCDF. Platform, instrument and data type metadata are now imported.
- "SeaDataNet Formats" importer now extracts comments from the data file and provides these comments via the new "Comments" meta variable.
- The "SeaDataNet Formats" importer now validates the "Bot. Depth" meta value: any value smaller than the maximum sample depth is removed. If the "Water depth" meta value exists and is larger than the maximum sample depth, this value is used for "Bot. Depth". Any such modification is logged in the station history as EDITMETADATA message.
- All "Export > Station Data" options now allow selection of the data variable subset actually containing data by pressing the "Select Items with Data" button on the "Select Data Variables for Export" dialog.
- nged quality flagging mappings between BODC and SMHI to SEADATANET (now v1.8; see https://odv.awi.de/fileadmin/user_upload/odv/misc/ODV_QualityFlagSets.pdf).
- "Best-of" P35 aggregation algorithm now maintains the original quality flag value if all contributing values have the same flag.
- Identification of the units part in ODV composite labels now requires the terminating] or) characters to appear at the very end.

BUG FIXES

- Fixed problem with duplicate station action when writing very many meta variables to output file. Tolerance for sample insertion adapted.

ODV Release 5.2.1 (Windows, macOS, Linux) Jan/30/2020:

- DIVA application recompiled: now runs on macOS Catalina and is about 3 times faster than before on all platforms.
- The actions triggered by left/right mouse clicks on the views bar "+" button have been exchanged. A left click now allows choosing one of the template layouts for the new views tab, while a right click now allows choosing one or more existing views for loading into new view tabs.
- Derived variable quality flags in spreadsheet, collection and netCDF exports are now in the flagging scheme of the primary variable, instead of the ODV flagging scheme used previously.
- An infix-to-postfix expression converter is now provided on the macro and expression derived variable dialogs. This lets you use macros and expressions, even if you are not familiar with postfix or revere-polish notation. The "Tools > Infix-to-Postfix Converter" option has been removed (Windows only).
- Meta Variable Value derived variable can now also be defined for string meta variables. ODV will try to convert the string to a number.
- New "delete_stations_matching" command-file command allowing deletion of a potentially large number of stations matching specific meta variables values.
- The SeaDataNet importer now uses case-insensitive matching between column labels and the subject value of semantic header entries. For instance, semantic header subject "Temp" will now match column label "TEMP [degC]".
- ODV now uses CDI-logic when matching imported data from a SeaDataNet source collection into another SeaDataNet target collection, with the "Check for existing stations" options checked.
- QARTOD quality flagging scheme and its mappings corrected according to https://cdn.ioos.noaa.gov/media/2017/12/QARTOD-Data-Flags-Manual_Final_version1.1.pdf.

BUG FIXES

- Fixed bug in station matching algorithm that made finding already existing stations unreliable during "Merge Data (selected variables)" and "Update Data (selected variables)" imports. Option "Tools > Find Duplicate Stations" was not affected by this bug.
- Fixed problems with "Full Range All Windows" option.
- Fixed problem with animations of data windows with gridded fields.
- Fixed problem with drawing bathymetry overlays with tiled map resources.
- Fixed problem when opening nc file without z or time dimension a second time.

ODV Release 5.2.0 (Windows, macOS, Linux) Oct/28/2019:

- The World Ocean Database data importer (Import > NOAA NCEI Formats > World Ocean Database) now supports the netCDF ragged array format in addition to the legacy ASCII format. Many additional meta variables are extracted.
- New CORA importer for Coriolis Ocean database for ReAnalysis (CORA; http://www.coriolis.eu.org/Data-Products/Products/CORA).
- The SeaDataNet importer now checks for valid dates and rejects files with no or invalid date. Also creates usage agreement files if a "readme.txt" file is found among the import files.
- The Argo profile importer now also accepts s-profile (synthetic profile) files.
- Data import with station matching is now orders of magnitude faster than before due to a new matching algorithm.
- NetCDF emulator now supports netCDF4 data types, such as NC_STRING, NC_INT64, etc.
- WOCEBOTTLE quality flag value 5 (not reported) now maps to ODV flag value 8 (bad quality).
- New canvas sub-menu "Sample Filter All Windows" allows easy setting or lifting outlier filters for all data windows in one step.
- New SDN URLs implemented for resolving LOCAL_CDI_ID and EDMO_code metadata.
- New option "Tools > Find Outliers > Spike Check" for finding spikes in the data.
- Now using new SeaDataNet URLs.

BUG FIXES

- Fixed problem when exporting to netCDF with "Export metadata quality flags" switched on.
- Fixed scaling problem of packed variables in netCDF files.
- Fixed problem causing crashes when importing Medatlas files.
- Fixed problem with "Station ID" specification in "Station Filter".
- Fixed problem with dynamic height calculation in cases of incomplete T or S profiles.

ODV Release 5.1.7 (Windows, macOS, Linux) Mar/18/2019:

- Support for parallelized DIVA runs when loading or redrawing multi data window views or creating interrupted maps is now implemented. Specifying, for instance, 4 threads leads to spead increases of factor 3 or more. See chapter 2.13 in the ODV User's Guide for information on how to specify the maximal allowed number of parallel threads. Default thread count is 1, resulting in sequential processing and providing no speed increase.

- Adding meta or data variables to an existing collection via "Collection > Properties > Meta/Data Variables > New" now can be achieved by selecting variables from another collection. This greatly simplifies changes of the variable sets.
- NetCDF emulator now supports contiguous ragged array netCDF files.
- SeaDataNet netCDF importer now supports SDN netCDF trajectory data files.
- SDN Transposed Spreadsheet File exports now include the "Access restriction" metadata.
- The initial selection of exported data variables in spreadsheet, collection or netCDF exports is now the set of data variables that actually contain data in the set of exported stations.
- You can now identify and delete empty data variables (e.g., data variables without any data values in the entire collection) in a collection via "Collection > Properties > Data Variables" by clicking the "Select Empty Variables" button and then clicking the "Delete" button.
- Adding and removing the current station to/from the pick list is now done by pressing the + (plus) and - (minus) keys. The "Enter"/"Del" keys are still supported for backwards compatibility, but usage is deprecated and this functionality may be removed in future releases.

BUG FIXES

- Fixed problem with netCDF emulator when netCDF file contains dimensions and variables with identical names.
- Fixed problem during SeaDataNet data imports whith SDN semantic headers containing multi-space parts.
- "Collect String Values" option was disabled in cases when no data existed for the primary variable. This is corrected.
- Fixed occasional crashes on macOS.

ODV Release 5.1.6 (SDC/EMODnet internal Windows release) Nov/25/2018:

- New "Export > Station Data > SDN Transposed Spreadsheet File" option (requires special settings file for option to be visible and accessible).
- Option "Export > Station Data > SDN Harmonized ODV Collection" now supports more P01 codes as well as parameter-specific unit conversions.

ODV Release 5.1.5 (Windows, macOS, Linux) Nov/14/2018:

BUG FIXES

- Fixed problems with creating new data windows in window layout mode.

ODV Release 5.1.4 (Windows, macOS, Linux) Nov/12/2018:

- WOD importer now supports the new WOD18 files and rejects older data files from previous WOD versions, such as WOD13. This is because units of many variables have changed between WOD versions. Please download WOD18 data files from https://www.nodc.noaa.gov/OC5/WOD/datawodgeo.htm.
- New TEOS-10 compatible Spiciness tau0, tau1 and tau2 derived variables based on McDougall and Krzysik, J. of Marine Research, 73, 141-152, 2015.
- Mappings of SEADATANET quality flags '5', '6' and 'Q' to ODV flags changed from '1' to '0'.
- NetCDF exporter now sets the "standard_name" attribute of "longitude", "latitude" and "date_time" meta variables to "longitude", "latitude", and "time", respectively. Variables with long name "time_ISO8601" and "Chronological Julian Date" now also have "standard_name" attribute "time". The primary variable in "Ocean" "Profiles" collections also has the value "down" for attribute "positive".
- New "Ferret_rainbow" and "Ferret_blue_orange" color palettes.

BUG FIXES

- Fixed problems with station filter when using constraints on string meta variables of value type TEXT.

ODV Release 5.1.3 (SDC/EMODnet internal Windows release) Oct/19/2018:

ODV Release 5.1.2 (Windows) Oct/02/2018:

- View specifiers, such as $FullScreenMap$ or $TwoPickWin$ can now be used as "-view" arguments when starting ODV from the command line. Note: In the Windows PowerShell the ` (back tick) escape character must be used in view specifiers, such as `$FullScreenMap`$.

BUG FIXES

- Fixed problems with installing bathymetry and map resources as well as checking for software updates on Windows.

ODV Release 5.1.1 (SDC/EMODnet internal Windows release) Sep/21/2018:

- Window layout mode now shows map and data window images for easier positioning and resizing of windows.
- "Export>Station Data>SDN Harmonized ODV Collection" option: (1) harmonized variables are highlighted by prepended '*' in the variable name; (2) parameters without data are excluded; (3) the long P01 parameter description is included in the variable's comment and shown in the variable's popup windows.

ODV Release 5.1.0 (Windows, macOS, Linux) Aug/07/2018:

- New flag Q in SEADATANET quality flag scheme.
- New '?' operator in ODV macros and expressions allows conditional calculations based on availability of values for given input variables.
- New "Best-of" P35 aggregation algorithm using only those contributing values with the best available quality. The previous "Use-all" algorithm using all available contributing values is still available. Also new is the creation of per-sample info strings containing the P01/P06 codes of contributing variables. The new "P35 Aggregation Properties" dialog allows algorithm selection and switching per-sample info creation on or off. This dialog always appears at the beginning of a P35 aggregation. P35 aggregation now only downloads the P35 vocabulary if a newer version is available on the NERC vocab server.
- NetCDF exporter now uses 'byte' instead of 'char' for quality flag data, and sets the 'standard_name' attribute to 'status_flag'. Also supports the 'ancillary_variables' attribute. now also exports string data variables and info strings. now uses chunking and compression for all variables. WARNING: ODV-created netCDF files now require netCDF4 for reading.
- New "String ID" derived variable, which for any TEXT or INDEXED_TEXT meta or data variable provides integer ID values for the different string values of the variable.
- New "Sample Filter" submenu provides options "Accept All Data", "Reject Outliers" and "Customize Settings" (previously: "Sample Selection Criteria"). The first two options are automatic and easy to use. Option 3 provides the full control over all filter settings as in previous ODV versions.
- New "Export>Station Data>SDN Harmonized ODV Collection" option for unit conversions and harmonization of SDN data collections.
- Outlier list files created by "Tools > Find Outliers (Range Check)" now also include values of the primary variable.
- Changed ODV file download URL to https.

BUG FIXES

- Fixed inaccurate section distance calculations for very short sections.

- Fixed crash when importing WHP exchange files containing empty lines after the END_DATA line.

ODV Release 5.0.0 (Windows, macOS, Linux) Mar/19/2018:

- New multi-view support via tabs and tool buttons.
- Sections can now have Time as along-section coordinate in addition to distance, longitude and latitude.
- More efficient importers (SeaDataNet importer is now about 8 times faster).
- Many other enhancements

BUG FIXES

- Many fixes.