HydroDesktop 1.0 Work Items

15th April 2010 Jiri Kadlec (Draft)

# Improve the Online Base Map

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| Level | HydroDesktop and MapWindow |
| Description | Improve and stabilize the Fetch HydroBasemap plugin. Change the default projection of vector base map data and observation data themes to match the projection of HydroBasemap and World Physical map (Web Mercator Auxiliary Sphere) |
| Related Features | 4180 (Add WMS Support) |
| Responsible  Person |  |

# Improve Vector Base Map Data

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| Level | HydroDesktop |
| Description | We also need to improve the vector base map data distributed with HydroDesktop. The source of the data should be public domain or we should have the proper permission to use it. Projection must match the projection of Hydro Basemap - Web Mercator Auxiliary Sphere (WKID 102100).  One potential source of base map data is: [**http://www.naturalearthdata.com**](http://www.naturalearthdata.com)  Specifically following map layers need to be displayed:   * Countries * Administrative regions (states, departments, provinces) * Populated Places * Parks and protected areas * Urban polygons * Ocean Bathymetry * Land Cover or Topography with shaded relief * Rivers and Lakes * Glaciated Areas * Aquifers   This change relies on the support for a .mwprj project file. |
| Related Bugs | 5457 (Map Labels)  Improve Basemap Data HydroDesktop discussion items |
| Responsible  Person |  |

# Improve User Interface (GUI) by using Ribbon Layout

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| Level | HydroDesktop |
| Description | **First Task:** Create a Ribbon Layout Document and screenshots  **Second task :** Implement the new GUI  The HydroDesktop user interface should be a Ribbon type of menu interface (similar to Microsoft Office). The ribbon type of user interface has several main groups:   * Common menu (visible in all views)   + Create new project, open project, save project   + Data Export   + Change time range * Map view (this is the default view)   + Zoom in, zoom out   + Zoom to full extent   + Previous zoom   + Zoom to selected   + Drag map (pan)   + Select or deselect shapes   + Information tool   + Print map   + Export map * Time Series Selector   + Which sites are displayed   + Which time series are displayed * Site Information Area   + Which variables are measured at each site   + Link to graph view and table view for the site * Graph View   + Type of graph   + Graph Display options * Table View   + Table display options (sequence / parallel) * Search   + Search Options   + New Search   + Clear Search result layer   + Download data * Metadata Fetcher * HydroModeler * Toolbox and Forecasting * Show Meteorological Satellite Data |
| Related Bugs | 5458 (Opening Form / Splash Screen)  5684 (Attribute Table icon does not work)  5685 (Zoom In does not work) |
| Responsible  Person |  |

# Improve the Search Plugin

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| Level | HydroDesktop, HIS Central |
| Description | **Simplify the Search GUI** and change the search process logic. The search panel needs to be part of the main application window.  Save previous searches  Display a “Search Results” layer on the map  When executing a search, if the “Search Results” layer contains some sites, give the user option to replace the search results or add to existing search results.  **Download Data** – Execute the download in a separate form. By default, download data for selected series in the “Search results” layer. Allow user to select the series to download by selecting in a table, selecting by variable, selecting by method, source, quality control level, sample medium, time support and data type, also allow selection by using a custom query expression. |
| Related Features | 5044 (User-End Problems, inc. Date Selection)  5367 (Improve GUI / User Experience in Search & Download)  5482 (Different Sets of Search Terms at HIS Central and within HydroDesktop)  5461 (DateRange Problem)  5465 (Selection of Keywords – improve user experience)  5642 (Exception on searching for “Nutrient” or “Nitrate Nitrogen”)  5687 (Incorrect Selection of Data Series for Paradise Creek)  5728 (Search plugin doesn’t work with some international date/time settings) |
| Responsible  Person |  |

# Project Workspace / Project File

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| Level | Both MapWindow and HydroDesktop |
| Description | HydroDesktop will allow users to create and save any number of "Project Workspaces." A Project Workspace is a user-defined grouping of data (i.e, the "Little Bear River" project or the "environmental flows" project). The project file should contain information about:   * Symbology of all map layers * Map Label setup * Map scale and extent * which plugins are loaded * Language settings * Database connection information * Language settings * User preferences (map projection, search method) * Selected Time series in graph view and table view   The HydroDesktop project file should be compatible with the MapWindow 6 project file and with the MapWindow 4 .mwprj project file. Each project will be associated with its own HydroDesktop DataRepository database. |
| Related Features | 4182 (Need User Settings to store for example, previous zoom extent)  4183 (Save Map Support),  4274 (Need Symbolizer File),  5761 (Allow user to change language)  5584 (Project Workspace) |
| Responsible  Person |  |

# HydroDesktop Plugin Interface

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| Level | HydroDesktop |
| Description | Allow HydroDesktop plugins to easily access the DataRepository database and HydroDesktop project files. Also simplify communication between HydroDesktop plugins by using events. Allow a plugin to add a ‘dockable’ side panel on the right side or left side of the map  **HydroDesktop plugin Interface Description**  Interface IHydroPlugin  Interface IHydroPluginArgs  IHydroPlugin Args Members:  **CurrentProject**  *(IProjectFile)*  **DataRepository** *(IDataRepositoryManager)*  **MetadataCache** *(IMetadataCacheManager)*  **Themes** *(IThemeManager)*  **TimeSeries** *(ISeriesManager)*  **Panels** *(IPanelManager)*  **Important events for plugin communication**  ProjectOpened  ProjectSaved  DatabaseOpened  MetadataCacheUpdated  PluginActivated  ThemeSaved  ThemeChanged  SeriesSaved  ThemeDeleted  SeriesDeleted  SeriesSelectionChanged  DataExported  SettingsChanged |
| Related Features | 5240 (Refresh graph view and table view when adding a theme) |
| Responsible  Person |  |

# Interaction between Map, Graph and Table View

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| --- | --- |
| Level | HydroDesktop |
| Description | One of the central features of HydroDesktop is time series and theme management. The map view, graph view and table view should be more closely linked together. Following features are suggested:   * Modify the map Identifier tool. When the indentifier tool is checked and the user clicks on the site in the map, the list of measured variables, time ranges and average data values should display in the context menu. * Add a ‘Site Information’ panel below the legend. When the identifier tool is checked and the user clicks on the site in the map, the site name, organization, and list of time series available at the site should be displayed in the information area. The information area should also contain a link to the time series table and graph. * Map Tooltip – when the user hovers the mouse over a site, show a miniature image of the time series graph * Graph View and Table View – When user switches between graph view and table view, the selected series should be the same * Map View Legend – Instead of showing the MapWindow legend, show the ‘Series Selector’ legend. In the series selector legend, display the organization image for each site. * Allow sorting of time series in the series selector * In the map, only display sites and time series which are visible in the series selector legend * Allow display of graph, map and table in a single screen * Theme Attribute table – should contain the AVERAGE, MAX and MIN values of each time series * Map View – Add a ‘Time Range’ selection menu to the main menu. When the user changes the time range, only sites with values within the time range are displayed in the map * Create Interpolated Map Option – User selects the time range and variable. A raster map is created by interpolating the average, sum, maximum or minimum data values from all sites matching the criteria * Integrate the HydroAnalyzer tool (by Yang Cao) to work with HydroDesktop time series data to create water availability maps by country, state and region |
| Related Features | This task is related to the **Improve User Interface** (GUI) task. |
| Responsible  Person |  |

# Improve the Metadata Fetcher

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| Level | HydroDesktop |
| Description | Metadata fetcher performance needs to be improved  All web services registered using the “Metadata Fetcher” should have their sites displayed in the map.  The ‘Metadata Cache’ database supplied with HydroDesktop should contain sites, variables and DataSeries metadata for the most important web services (USGS NWIS, EPA, USACE, NCDC) to improve search speed. |
| Related Features | 5435 (Metadata Fetcher should do incremental saves) |
| Responsible  Person |  |

# ArcGIS Online Data Cart

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| Level | HydroDesktop |
| Description | HydroDesktop should be able to export and import data themes to and from the ArcGIS Online "Data Cart". Initially it should support the simple data cart: The simple data cart is a list of time series metadata which includes the web service link saying how to download the observation data. Proposed implemenation is:  In the Search Plugin: Add an option "Download Data from ArcGIS Online" User enters the ArcGIS Online Data Cart URL The Data Cart is processed by HydroDesktop, Actual data is downloaded by calling the GetValues web service method and saved to the DataRepository Database as a new theme.  Create a new "Export to ArcGIS Online" plugin. User selects a theme or a list of time series by selecting in the map or in the attribute table. HydroDesktop creates a new 'Data Cart' xml document User enters the ArcGIS Online Login The Data Cart is uploaded to ArcGIS Online |
| Related Features | 5790 (ArcGIS Online Data Cart) |
| Responsible  Person |  |

# Download GIS Datasets

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| Level | HydroDesktop |
| Description | This is a requirement from HydroDesktop 1.0 Functional Specifications document:  Add the support of downloading GIS hydrology related datasets (soils, land use, watershed boundaries, aquifers, geology). This feature is similar to BASINS. |
| Related Features | No related features or issues |
| Responsible  Person |  |

# Improve the Installer

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| --- | --- |
| Level | HydroDesktop and MapWindow |
| Description | The installer needs to be stabilized. Major issues include:   * ‘Unknown Publisher’ warning message in Windows Vista and Seven * If the user doesn’t have the .NET Framework 3.5 the installer doesn’t install it properly * We need to add an “Include Sample Data” or “HydroDesktop Sample Projects” option. There also should be a “World Basemap data” option. |
| Related Features | 5727 (Installer does not correctly install .NET framework 3.5) |
| Responsible  Person |  |

# Improve the HydroDesktop Database and DB Abstraction Layer

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| Level | HydroDesktop |
| Description | Stabilize the underlying database and database abstraction layer: There should be a set of pre-defined built in query functions for common database query scenarios. Especially, following built in queries should be provided:   * List of time series by site * List of time series by variable * List of time series by variable and time range * Statistical summary of max, min, sum and average data values for a list of time series   In addition the related bugs below must be fixed. |
| Related Bugs | 4976 (HydroModeler DbWriter component saving to database error)  5216 (Delete Themes Error)  5402 (DataServiceInfo isHarvested is not mapped)  5403 (HydroDesktop.Data Unit Tests don’t pass)  5405 (Source.DataServiceInfo not mapped/used)  5406 (Additional Indexes)  5433 (Full Support for WaterML 1.1)  5452 (sql lite 32/64 bit)  5651 (delete/refresh themes error)  5458 (Support for SQL Server)  5655 (Reduce dependence on embedded SQL queries)  5686 (Export Data to CSV – incomplete Metadata) |
| Responsible  Person |  |

# HydroModeler Tasks

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| Level | HydroDesktop |
| Description | Stabilize the HydroModeler plugin by verifying and testing the tasks listed below: |
| Related Bugs | 5043 (HydroModeler: Viewing NEXRAD data in graph view)  5339 (HydroModeler: Muskingum component fails if time horizon is large)  5348 (HydroModeler: Cannot open composition)  5365 (HydroModeler: DbReader)  5599 (HydroModeler: The SMW slowing simulation)  5600 (HydroModeler: The Muskingum Component is too slow) |
| Responsible  Person |  |

# Documentation

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| Level | HydroDesktop |
| Description | HydroDesktop should have a standard format Help menu. Help Contents would have to be written and compiled, and should include basic information on using HydroDesktop. Plugins should also be able to add their own Help documentation to this menu. |
| Related Bugs | 5598 (Add Help Menu / Documentation) |
| Responsible  Person |  |

# Improve the Graph View and Table View

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| Level | HydroDesktop |
| Description | Improve the performance of the graph view. In the table view, if the number of data values is large, only display the first ‘page’ of data (first 1000 records). In the graph view and table view, show a progress bar when reading of data values from the database takes a longer time. Modify the graph view to be able to compare modeled and observed time series in one graph. |
| Related Bugs | 5656 (error on time range scale at the graph view) |
| Responsible  Person |  |

# Time Series Data Import and Editing

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| Level | HydroDesktop |
| Description | Allow the user to edit time series in the table view and import data from a text, csv, excel or WaterML file. |
| Related Bugs | 4184 (Integration with ODM Tools)  4185 (Add editing of tabular observation data) |
| Responsible  Person |  |

# Support for Meteorological Grid Datasets

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| Level | HydroDesktop |
| Description | Download and display of gridded datasets should be an inherent feature of HydroDesktop. Important datasets include satellite based temperature, precipitation and solar radiation data (TRMM, DayMet, MODIS, NEXRAD) as well as the results of global climate models. One possible data format to examine is the NETCDF format. However, we need to consider that NETCDF may store multiple grids, time series tables and arrays. |
| Related Bugs | 4187 (NETCDF Support) |
| Responsible  Person | Jiri Kadlec (Remote Sensing final project) |