EE Modeling System Changelog

The following summarize the most significant changes to the EFDC_Explorer Modeling (EEMS) since the release date noted. The changes and enhancements are generally organized by primary EE features. All changes are for EE unless noted as a change to the EFDC+ Fortran code (formerly known as EFDC_DS or EFDC_DSI). The latest version of the EFDC_Explorer Modeling System is available to registered users on our web site at www.eemodelingsystem.com

Enhancements to EFDCPlus/EFDC_Explorer8.2 Capabilities

Release 4 July 2017 (8.2.5)

Bug Fixes

- Crash when load too many points from ViewPlan into velocity time series
- Crash when delete lines in Line Control Options for velocity time series

Release 3 July 2017 (8.2.4)

Updates and Modifications

- Added the option to export the boundary conditions for running SWAN when using the EE "Export SWAN" function.

Bug Fixes

- Minor issues with jet/plume BC interface which flagged the W/R series as bad (ICAL=2)
- W/R BC editing form resetting the table back to “None”.
- Harmonic BC crash in editor

Release 27 June 2017 (8.2.3)

Bug Fixes

- SWAN invalid file path
- Jet/plume interface crash
- RGFgrid export causing slight distortion
- Line format when importing time series data
- Bottom elevation legend display in boundary conditions viewing option in ViewPlan
- Input for harmonic tides issue
- NetCDF writing VELY & VELZ issue
- Wave data initialization when double click icon
- Loading and saving some old wave model issues in EFDC.INP

Release 3 March 2017 (EFDC+ for 8.2.2)

Bug Fixes

- Issue with temperature spikes (caluvw, calpuv2c, calpuv9c routines)
- Issue with dynamic time stepping

Release 22 February 2017 (8.2.2)

Bug Fixes

- ViewPlan - Show/Hide Legend
- ViewPlan - Velocity time series crash
- View3D - waves, toxics, water surface, WQ and legend display issues
- Vertical profile plot display issue
- Load marker issue for time series plots
- Only check wind timing if nWser>1
- Open BC vertical velocities bug (EFDC+)
- Changed calheat to treat dry cells (EFDC+)
- Bug fixed for WNDWHT and rearranged indices (EFDC+)
- Hydraulic structure issue (EFDC+)
- Bug when ISTOPT(2) =0 (EFDC+)
- Changed the the order of the variables reading from C1A (EFDC+)

Updates and Modifications

- Revised SGZ cell face metrics to better handle fluctuating WLs (EFDC+)
- Update to SEDZLJ for erosion/deposition and bedload to correct mass balance (EFDC+)
    - Removed MORPHJ
    - Note that this requires a change to the EFDC.INP file so all models need to be saved before running for this release.
- Layer controls hidden after selecting top layer of sediment
- Added a check for viewing when water depth has not been initialized
- License updates

Release 5 January 2017 (8.2.1)

Bug Fixes

- WQ variable initialization issue when turn on WQ module
- Not save correct WQ BC grouping when opening from VEFDC model
- Crash EE when view multiple velocity TS from ViewPlan
- Time series calibration settings not saved
- WQ light extinction values not being updated when modified in another form
- EE could not browse to the root directory level
- Scrambled model path when double click EE icon from model folder
- NS-EW connection issue
- Issue reading toxics file DOCW.INP

Release 28 November 2016 (8.2.0)

Major New Features

- SEDZLJ Sediment Sub-model in EE
- Marine & Hydrokinetics Sub-model in EE
- netCDF Output from EFDC+
- Atmospheric Pressure Impacts on Hydrodynamics
- New Temperature Sub-Model Heat Balance Option

Minor New Features

- Station weighting improvements for Wind/Ice/Atmospheric data files
- Drifter Count Tool - Count drifters in a user specified area
- Temperature sub-model user interface improvements
- Improvement to 3D display options
- Simplified numerical options
- Vertical profile plots for presentation in Vertical Profile Tool
- Added ability to correctly load VEFDC models

Updates and Modifications

- Major update to View3D color ramps using array for viewing options
- New Open BC feature to flatten bathymetry adjacent to BC group cells
- Improvements to View3D georeferenced background images
- UTM Zone and Model Centroid defaults and functionality
- Modifications to method and autoscale for orthogonal deviation
- Warning that for vertical profiles plots require 3 or more points
- Alert if missing the start of the simulation period
- Export oil values in LPT viewing option to the KML file
- Shortcut key for license manager (F3)

Bug Fixes

- Cruise plots display in SGZ
- Viewing series data with comparison model
- Issue of reporting bug when a bad project is found
- Issue of deleting first line in wind series then deleting other series
- Could not save anemometer height when switching wind series
- Longitudinal profile tool to plot ice thickness
- Time series calibration for ice issue
- ATM series selection, TWet was not saved
- EE display on task manager of Windows 10
- Fixed WaveAngle, added WaveLength for Internal Waves
- Legend disappearing
- Read wrong time from SWAN model
- View3D display of magnitude and legend when animating
- Display 3D grid when clipping by value
- Crash when using statistics tool
- Issue when getting values on ViewPlan Water by Depth Option
- Critical Habitat legend issue
- Correct wrong assignment for solar radiation
- Enable cell edit in ViewPlan Water by layer option

- Updates to Critical habitat to work with WQ and water depth
- Reading calibration file with empty lines
- Issues with KC and KB when using in pointer calculations (converted to Long)

Enhancements to EFDCPlus/EFDC_Explorer8.1 Capabilities

Release 23 September 2016 (8.1.3)

Updates and Modifications

- Enable cell edit for Water by layer
- Vertical Profile Plots now allow change to width/height of form with Ctrl+W
- Update name of View3D Viewing Options for color ramps
- Updates to #output location (EFDCPlus)

Bug Fixes

- Timing frame location in Trial Version
- Critical Habitat legend issue in ViewPlan
- View3D WC display for Sigma Zed
- Corrected wrong assignment for Solar Radiation
- Issues with KC and KB when using in pointer calculations
- Fixed TFAST/TSLOW bug for Full Heat Balance (EFDCPlus)
- Lagrangian Partical tracking issues in Sigma Zed (EFDCPlus)

Release 26 August 2016 (8.1.2)

Updates and Modifications

- Updates to dongle licensing
- Clean and format activation log
- Changes to clearly apply Z for View3D
- Lagrangian Particle Tracking updates
    - Added more QC for particle generation
    - Updated some messages and tooltips
    - DrifterView = 3 as the default
    - Exporting function for SHP and KML
    - Change View3D for oil and ice color setting effect to follow the primary, secondary, tertiary color ramp settings
- Moved banner setting to general 3D options
- Update Save Plot for Velocity Map
- Minor modification to the local SegElev array in View3D to make more consistent

Bug Fixes

- Crash if update UTM location
- Bed temperature flags when editing variable T and Thermal Thickness

- Bug with loading WQ benthic maps when IC*JC > Integer short
- Changed the DryLoss summary (EFDCPlus)
- Drifter going through hydraulic structure BCs (EFDCPlus)
- Fixed LPT in View3D when displaying with color elevation option

Notes

- Full deactivation and reinstallation required if updating from 8.1.0 or earlier
- Known bug with scrambeld model path when double clicking EFDC.EE icon to open in some machines

Release 12 August 2016 (8.1.1)

Updates and Modifications

- Fix particles to bed after deposition option (EFDCPlus)
- Allow particles to not move with water depth (EFDCPlus)
- Improved the writing of the QSER file for SGZ models
- Updated wrapper for proxy
- Added contour ratio option
- LPT distribute drifters timing toggle
- Added triangular cell for gradient fill

Bug Fixes

- Toxics precision issue
- Particle color/legend issue
- Apply all cells in BC Flow group issue.
- BC popup displays many times/EE crashes when show BC
- Show contour legend
- Legend automatic zoom in when turning on contours
- Contour line formating issues
- ViewPlan: legend with All Layers & Bottom Layer options
- View3D legend number format issue,
- View3D particles issues
- View3D inquire function
- Updates to dongle message
- Import CVL grid(s) bugs
- CH3D grid import problem, generate grid problem, crash problem when load some EE7_2 model
- Import Delft Grid bug
- A problem with volume versus area weighting for water column
- Bug with trying to set range for the wrong SedShow option
- Minor ViewPlan inset updates
- Velocity anchor, legend when rotate the model
- Bug with time series plots of bed temperature and surface water temperature
- Issue with editing bottom layer for SGZ models
- Issue with displaying algal limiting factors for SGZ models when K < KL
- Update for atmospheric option
- Fixed velocities when compare models
- Updated the save/load setting for ViewProfile

- Load/save layout setting on vertical profile issue
- Fixed NetCDF export from EE
- Update I,J for NetCDF
- Add a check to deal with crash when set bottom for larger .bil file
- Issues with wet/dry
- Fixed HDMF to all cells
- 3TL issues (EFDCPlus)

Notes

- Full deactivation and reinstallation required when updating to this version.

Release 8 July 2016 (8.1.0)

New Features

- Offline/dongle activation
- SEDZLJ input display
- Time series cell list feature
- Simplifed line formatting in time series plotting
- Automatically change zone of wind station

Bug Fixes

- netCDF export from EE when cell buffer less than 3.
- View3D generate DEM issues
- View3D viewer auto ramp feature
- View3D Velocity banner scale
- View3D display of masks issue
- Did not use shape file to set vegetation class correctly
- Autoscale with view feature did not work well
- Legend text when plotting time series
- Velocity vector display incorrect in some cases
- Gradient fill feature did not work when showing oil
- Export metafile after resizing frame
- Longitudinal profiles plots feature issue in some cases
- ViewProfile: show plan view not working
- Contouring color ramp not assigned for the legend (ViewPlan)
- Polygon editor crash
- Model rotation interfered with other functions in ViewPlan
- Contour color ramp was not assigned to the legend

Enhancements to EFDCPlus/EFDC_Explorer8.0 Capabilities

Release 6 June 2016

Bug Fixes

- Longitudinal profile not updating for toxics/sediments and with multiple layers
- QSER.INP writing when KC=1
- ViewPlan zooming and rotating issues (display angle <> 0)
    - Rotation with rotated labels
- Crash when edit blank annotation labels
- Wave initialization message when run model
- Velocity legend when all layers selected
- Generate model options blacked on Windows XP
- Load GVC model issue for one case
- Ice model crash for one case
- "Use Raw Data" option for ADCP Vector Plots
- Wind timing frame when view time series
- Wind timing with rotation and animation
- Layout setting on FixedParams in ViewPlan
- Timing frame XY plotting to eliminate the old TSTEP approach
- ViewProfile vector display bug
- Default font color issue
- Timing issue (Go time)
- Fix contour when viewing "% Irradiance Water"
- Corrected Residual/Mean mass transport options
- Update ContourSetRamp when loading/saving views and for MMT/Residuals
    - Fixed Contour Plot key issue, legend
- Velocity vector jumps outside frame when animating
- Several issues with the polyline editing tools in ViewPlan
- View3D georeferencing, button/menu behaviors
- Residual plot when change timing(scrlTime) while Residual turn on
- ViewPlan, Velocity All Layers legend display issue
- Particle tracking position issue
- Loading velocity with high frequency when depth averaged
- EE_SEZIJ.OUT and bugs from Yong Bok model (EFDC+)
- Bug in SETBCS that caused the velocities to be reported as 0 (EFDC+)
- Reverted to Jacobian matrix to 073_OMP code (EFDC+)

Updates and Modifications

- Major updates to ViewPlan and View3D layout saving and loading
- Timing frames save and load more consistently
- Description for Weighting Map
- Updated EFDC_BC to work better for selecting and deleting BC groups
- Added better QSER treatment with Sigma Zed
- Shortcut to delete the license file in special cases
- Get color ramp types
- Line editing updates (iSelectLine)

Release 9 May 2016 (EFDCPlus only)

Bug Fixes

- Issue with velocity not being output for some models

Release 21 April 2016

Bug Fixes

- Issue with RunQA for open BC's
- Export Bitmap file when turnning on ViewPlan.
- Resize Legend issue
- Corrected messages, added more log for licensing
- Load Existing Definitions function
- Plotting hydraulic structures issues
- Set ISHOW for efdc+
- License issue when switch users
- View2D Resize Frame issue on Legend size
- Minor Collada fixing
- Update for View3D rebuild
- Legend for ViewProfile
- Inquire issue, legend View3D issues
- Updated tmsr, hydrstruc and input checks (EFDC+)
- Fixed QCTL issue when not used (EFDC+)
- Adjusted culvert control flows (EFDC+)

Updates and Modifications

- Major updates to EFDC Input Tide
    - Remove unused Xcoord, Ycoord in tides tools
    - EFDC Tides Plus forms
    - Update unit setting effect
- Major update on loading output comparison model
- View3D particle tracking
- New color ramp contour style in View2D
- Added some checks for SGZLayer reading
- Update variable declarations
- View3D loading

Release 4 April 2016

Bug Fixes

- Loading comparsion model issues, load data file for calibration
- Added Internal Arrays to the ViewProfile
- Corrected correlation plot issue
- Added wave default values to the EFDC.MDB initialization process
- Corrected wave variable issues and display in ViewPlan
- Added tooltips for AHO option

- Timeseries Comparison Plots issue
- Loading EE_BC output
- Issue with time series plotting for multiple series
- Crash when open timing frame in View3D
- Removed duplicated calling of Rebuild3D function
- Greek Symbols issue in BC's and set focus bug
- Fixed some minor issues with Overlays
- Corrected caltoxb.f90 issue
- Updated wet/dry issues with HKP/H1PK (EFDC)
- Updated caltran.f90 for the anti-diffusion (nuanced) approach
- Fixed some windwave issues when using SGZ (EFDC)
- Added LLAD/LKAD variables (EFDC)
- Removed vegetation from open BC cells (EFDC)

Updates and Modifications

- Licensing and activation updates
- Loading 3D GeoDEM surface file
- Loading and displaying 3D structures (COLLADA) and added materials and effects

New Release 9 March 2016

New Features

- Sigma Zed EFDC Model integrated into efdc+
- OMP Model now part of efdc+
- Enhanced hydraulic structures including culverts and bridges (efdc+ and EE8)
- East-West connectors (efdc+ and EE8)
- Map file enhancement (efdc+ and EE8)
- Spatially variable background diffusivity (AHO)
- Rooted Plant and Epiphyte Model (RPEM) in calibration plots
- Import and display COLLADA structures in View3D
- Time series plots for boundary conditions
- Improved drifters visualization for large number of drifters
- Use of pointers for water surface elevations (WSEL) to display larger models
- Licensing changes

Enhancements to EFDC_DSI/EFDC_Explorer7.3 Capabilities

Release 10 December 2015

Bug Fixes

- Warning message if EFDC Restart Option (Input) is selected
- EE Crash when comparing two models
- Export shapefile method for model outline
- Extraction tools issue for I, J and headers
- Velocity Profile does not display if English mode is on
- Values not converted in English mode in calibration plots
- Model statistics problem for forced evaporation
- N-S Connection issues
- Fixed wind weighting
- SWAN issue for unsteady waves including wave.inp (EE and EFDC_DSI)
- Import grid issue, cell loss problem when generate model by CVLGrid
- Correct the title loading sub-domain CVL/RGF grids

Updates and Modifications

- More checks for wind data
- Warning message for 2D velocity
- Hide layer frame if fixed parameter option is on
- Tweaks on restart and continuation

Release 17 November 2015

Bug Fixes

- EE hangs when calling NetCDF on some PCs
- ArcMap format with NetCDF file
- Issues with cmdUpDate_Click in EFDC_Generate.frm
- IEVAP for old models with IEVAP=2 and missing CLEVAP
- Wind Rose Plot and Contours when generating new model
- EFDC Restart Option
- ViewPlan
    - Internal Arrays settings in ViewPlan
    - Legend of Sediment flux option in ViewPlan
    - Add layer on the legend for downstream projection with all layer option
    - Missing color ramp in ViewPlan legend
    - Issue with contour labeling
    - Downstream projection default time for x axis and legend issue
    - Made some fixes to the downstream velocity projection for range of layers
    - Total distance of Velocity Profile
    - Time series label, check time step before message error
- Fixed Lat/Long bug
- Fixed WQ data series precision issues
- Fixed some boundary condition and time series issues
- View3D legend, blanking frame issue

- Correct velocities direction on time series of cells
- Infile when whole path in Set_AnalysisFile
- Fixed English units axis labeling and for calibration, time series annd cruise plots

Updates and Modifications

- Major upgrade for treating velocity units for all the various velocity viewing options in EFDC_View_2DPlan.frm
- Velocity units for Rose, Downstream and ViewPlan
- Cleaned up the treatment of check box functions for velocity
- Cleaned up the Heat Exhange parameters when not ISTOPT(2)<>1 or 4
- Units displayed in EFDC Run screen (EFDC)
- Check updates for EE option
- Missing text when change screen scale to 125%
- Lighting 3D Overlay
- Licensing format
- Removed eev from eev3d filters

Release 22 October 2015

Bug Fixes

- Corrected updating data for generate grid
- Mass balance issue with evaporation
- Overwrite of series ID when importing data
- Issue with changing rose number and rose percent
- Metric/English units/switching issues in ViewPlan and Cruise plots
- English units time series contour, downstream, velocity rose issues
- Fixed minor bug for time series ID when importing data
- Cruise plot key disappeared with cyan-blue color at run-time
- shape file with contour lines
- contour Legend in 2D Profile
- 3D Legend not changed with Velocity Magnitude
- Flat surface on 3D viewer
- LPT
    - Fixed issue for particle count not showing properly when using LPT module for time series of particle count for the whole domain using "General Statistics" button.
    - Load drifter output file of model for updated EFDC which checks drifters inside domain
- ViewPlan
    - Velocity downstream projection
    - Timing frame on animation mode
    - Velocities issue with legend
    - Legend issue switch from temperature to velocity
    - Zoom issue with time series contours
    - Daily Min & Max Plot in BC Data Series Editor
    - Correct Tides: time duration
    - Load 1 cell velocity results, comparison model and close files issues
    - Color Ramp with Gradient Fills
    - Velocity time series direction
- Water Quality
    - Fixed WQ series special cases

  - Scanning sediment diagenesis file
  - Setting WQ zones
  - Set Conversions default tab
  - Added default file names for bed nutrient flux/diagenesis
  - Fixed ViewPlan conversion modal flag
  - Time Series Contour for Water Quality

Updates and Modifications

- Add option show/hide rose title, reset scale to the default
- Added conditional cell selection: Water Depth
- Added evaporation on mass balance tool and minor other updates
- Rearranged wind and aser station coordinate info in dialog
- Minor Legend 3D issues
- Added lighting for Drawing 3D Annotations
- Ensured ICONTINUE reset when saving files
- Update Contour legend and font size
- Clarified comment for EFDC_Tools_BedConstruct.frm
- Update Drawing EFDC_Plot_Series.FRM just on Viewing area.
- Update Set the Default Right Y Axis label
- Added Feet in distance tool on ViewPlan
- Added some logging for EFDC template reading
- Update UTC on Get DSI time server function
- Some changes to F2 help
- Added better default file names for DSG file
- Default values for Waves
- Ice
  - More cleanups to ISICE 3/4
  - Added ICEK as an input variable for ice cover
  - Added Ice thickness to calibration data types
  - Removed ISICE check from EE_Arrays
  - Added ice TS calibration feature

EFDC Bug Fixes and Updates

- Major update to the ice formation/melt process
  - Added a ice melt factor to allow adjustment to to ice melting timing
  - Fixed IceTemp for small ice thickness
  - Fixed water balance for ice formation/melt when using single precision
- Fixed problems with the Anti-Diffusion (caltran.f90), mainly with negative values, i.e. cold water.
- Added a limit for turbulent intensity
- Fixed BC for diffusion equation
- Added EQ computations based on changes in wind sheltering (calheat.f90)
- Updated for better performance for SCB/Open BC's (caltran.f90)
- LPT issues for negative depths
- Fixed LMASKDRY issue for restartmod.f90
- Toxic calculation issues
- Corrected efdcout in case of very large model
- Fixed bug on restart
- Fixed several issues with obtaining OMPX = OMP1 results

- Fixed zeroing dry cells when different threads are being used for the same parameter (e.g. NTHREADS > Active Constitients, caltran.f90)
- Fixed SVBO zero bug
- Fixed bug in AD when CON was used instead of POS
- Rolled in CH's updates to sediment settling

Release 21 September 2015

Bug Fixes

- Fixed model grid generation issue
- Import CH3D grid issue
- Import ECOMSED grid issue
- Merge continuation runs issue (Resample_EEout and Merge_EEout)
- Various misspellings and typos
- ViewPlan Issues
    - Corrected and improved PolyTools
    - Problem with loading time series/vertical profile points
    - Refresh selected cell information
    - Toxics display issue
    - Ctrl-W function on plot time series
    - Longitudinal Profile line editing
    - Time block statistics standard deviation = zero issue
    - Importing date/time stamped data into the time series plotter
    - Issues with the English units conversions
    - Changes to units conversions, especially for longitudinal profiles (Current_Param, Current_Param_Depth)
- View3D Issues
    - Water column display issue
    - Sediment display
    - Toxic and spin-up layer
    - Data validation and fix bugs for toxics and sediment bed display
    - Diagenesis, RPEM corrected
    - Re-align solid color ramp on legend
    - Loading overlays and DEMs to display
    - K blanking issue
    - N-E Scale
    - Non-convex polygon display (using polygon triangulation algorithms)
    - Added ArrayDimensionsAPI() function to check array
    - Boundary condition text fields
    - UTM conversion when latitude is negative issue
    - Fixed HSPF import crash
    - Changes to plotting evaporation and forced evaporation
    - Fixed timing frame issue with W/R
    - Fixed saving/loading longitudinal profile formats when using miles
    - Animating profile views (bShowPicPVInset)
    - ViewProfile legend and timing issues
    - Cleaned up application of big data warning
    - Data extraction issue
    - Issue editing WQ boundary condition

Updates and Modifications

- Added Displaying "Reynolds #" on Water by Layer and for contour, timeseries
- SWAN import, export, output result, wave display,
- View3D and blanking by value
- NetCDF support ArgGIS reading
- Refresh selected cell's information after changing any options
- Updated formatting for IC fields
- GetCornerLList() clean up of code
- Display polygons in View3D
- Update load and display of shape (.shp) files
- Contour plot keys updated
- Update for ClipByValue

Release 1 July 2015

Bug Fixes

- Applied ug/l for toxics in BC forms
- Tweaks to toxics and overlay transparencies
- Display of toxic in sediments in View3D
- Contour issues
- Default LPT Symbol properties
- Surface option of overlays displayed in View3D
- Export bitmap with compass error
- Initial ice color made consistent with color ramp on legend
- GVC issue in atmmap & winmap file formats
- Legend for Model Metrics in ViewPlan
- Corrected issues with View_Load/View_Save for 2D and 3D

Updates and Modifications

- Waves in ViewPlan
    - Added Mean mass transport feature for Wave Parameters Option
    - Added View Longitudinal Profile for waves
    - Added View Timeseries for waves
- Added default Oil Parameters in LPT
- Added color by elevation ramp to View3D legend
- Disabled "Cyan-Blue" for Cruise Plots
- Updated EE links

Release 19 June 2015

New Features

- Ice Sub-model
- Forced Evaporation
- NetCDF Output
- Run SWAN from within EE
- Elimination of Template Files

- Flight Path Animations
- Other Improvements
    - Export Toxics in Tecplot Update
    - 3D Symbols
    - Buffer loading for EE drifters
    - Subscript and Superscript in Graph Legends
    - Delete Lines from Line Options (Time Series Grapher)
    - Display Miles or Feet in Labels
    - Specify Color Ramps
    - Particles on the boundary disappear in 3D
    - Change Legend Font Sizes
    - Display Wind and Atmospheric Stations in ViewPlan
    - WSER, TSER and ISER Timeblocks
    - Automatic Seat Deactivation
    - Date and Coordinate Conversion Tool
    - Display Model Comparisons in Time Series

Enhancements to EFDC_DSI/EFDC_Explorer7.2 Capabilities

Release 19 September 2015

Bug Fixes

- Load windmap.inp issue
- HSPF import crash
- Hide View 3D ClipByValue if not available in selected view
- English units issues with ViewPlan

Updates and Modifications

- Added Reynolds Number to ViewPlan
- Update model centroid for Wind/ATM Station's
- Refresh selected cell information after changing options
- Updated picPVInset animation issues
- Removed comments for importing date/time stamped data
- Update SWAN output result and other fixes

Release 21 August 2015

Bug Fixes

- Crash when edit labels
- Deleting BCs and Labels issue
- Compute and display time series plot of River Kilometer (ALT-R)
- Legend issue when using Load the Layout from a File (ALT-L)
- Problems when using or passing textbox values without checking if they are numeric
- Draw grid at surface and bottom issue

- Outline ViewPlan inset when animating
- Legend issue on Diagenesis
- Velocity banner on 3D
- Correct Values when changing English Units (Current_Param_Depth)
- Contour Settings
    - Update missing last color in contour legend
    - Hide text angle for contour label
    - Reverse colors issue
    - Remove border on the legend if not show contour line, re-format the legend
    - Contour does not update when changing the depth
    - Missing the last block of the contour legend
    - Limits not initialized in contour option of ViewPlan
- Extract model outline issue
- Changed DEM color ramp options
- Cleaned up some QSFactor code for open BC's
- Data extraction for large models
- Error "Error loading picture in DIB!" inset map in time series
- Export Meta File for 2D Profile
- Dye loading and EE crashed when use General Statistics tool
- SSFrame change font sizes
- Velocity – bad pointer
- Flux_Tool concentration index issue
- Import CVLGrid function
- Zooming with cell map issue
- Error in generating a model with grid from Delft3D
- Incorrect assigning of values when plotting multiple lines which have -999 values

Updates and Modifications

- Update model centroid for Wind/ATM Station's location
- Set default ViewPlan Option as Bottom Elevation when loading model
- KML_Read improved for files with various lines/polygons
- Tweaks to Toxics
- Added some wave QC
- Minor fixes checking update, wave.inp

Release 12 May 2015

Bug Fixes

- Display of wave parameters in ViewPlan
- Checking invalid wave parameters
- RPEM not enabled issue
- X axis display in ViewPlan, not plotting the series when plotting boundary condition
- Open BC View Group issue in ViewPlan
- ALT-I "Load the Series/Profile Locations from a File" issue
- Legend issues, exporting image with plan view inset on Plot series
- Legend issue in hide title and border line of legend
- Corrected tooltip for add by polyline button
- Legend for contour when generating AVI
- Bitmap rotation exporting issue

- Issue with selecting the first cell when show series
- Changed polygon to polyline on add cells BC
- View3D bugs for viewing water column, oil, legend, blanking
- Duplicate values in EFDC_Explorer.ini
- Conflict for constant declaration, correct the backup fixing resampling-output codes.
- Correlation Plots statistics
- Re-sampling output issue for EE_SED.out file
- Cruise plot issues
- Finding time plot issue in Generate Plots function

Updates and Modifications

- Reset activation log file each time EE start
- Extraction Tool
- Added comment for resampling-output timing
- Licensing process
- View3D Blanking, animation of legend
- Save plot for LPT
- Set default option for water column

Release 15 April 2015

Bug Fixes

- E/N scales for PlanView inset
- Legend height issue when animating
- WQ value issue, WQ clipboard issue
- Missing model result when exporting xy data file
- Overlap controls of assign form
- Missing time step while while extracting time series
- Export background image and compass
- Missing Velocity Plots if the user chooses more than 5 locations
- Updated the Toxics to properly work with fpoc*SND & fpoc*SED
- Issues with the mass balance tool
- 3D bed shear bug
- Loading masks (when delimiter was anything other than spaces)

Updates and Modifications

- Reset activation log file each time EE start
- Assign full access permission for folder function
- Check Longitudinal Profile Plot if the user does not choose any parameters
- Activation Form Interface
- Set default invalid flow factor
- Generate model from delft3d file
- Help index ID base on the EE7.2 user manual CHM file
- Automatically turn on global view after load TB2 file
- BC ID's for open BCs
- Check Flow Factor
- Plot velocity vertical profile when move timing issue

Release 13 February 2015

Bug Fixes

- Corrected WASP7 linkage for EE to create .WSP file
- Shapefile exporting crash
- Importing RGFGrid
- Loading of some historical GVC models now corrected
- View3D display issues
- Fixed save/load plot for contours
- Check valid time value for save plots
- High frequency output plotting issue at end of line data points
- Problem with the ISRESTI = 1 option
- Vertical profile plots not displaying due to the symbol thickness = 0
- Makepath function issue
- Loading masks (when delimtor was anything other than spaces)
- BC ID's for open BCs
- Fixed Export EMF with BG issue,HF plotting

Updates and Modifications

- Flat terrain viewing improved (further updates planned for models that cannot yet be generated)
- Contours - blue for outside ranges
- Added formating option for Wind/ATM stations
- Line Options to Vertical Profile Plots

Known Issues (Currently Outstanding Bug Fixes)

- Import of corners.inp for grid generation

Release 12 January 2015

Bug Fixes

- Corrected allocation of variables when calling LPT and Hi-freq snapshots for AREA_CENTRD from input.f90 to aaefdc.f90

Release 9 January 2015

Bug Fixes

- Loading of existing EFDC velocity linkage files for EE versions before 7.1.
- If oil spills were not simulated initial drifter depths being set to the surface, even if not wanted.
- Compare model velocities vector display
- Correlation plot setup incorrectly configured
- 3D GUI issue for View3D
- Wet/Dry Cells for View3D
- Clean and update missing parameters
- GetRelativePath function

- Bug for View3D view - sediment bed
- Rating curve issue when changing number of layers
- Problem with reading efdc.inp C91

Release 5 December 2014

New Features

- Oil Spill Modeling with Lagrangian Particle Tracking (EFDC and EE)
- Boundary Condition Editor Upgrades
    - Hydraulic Structures Boundary Condition (EFDC and EE)
    - Jet Plume Boundary Condition Editor
- Time Series Contours in ViewPlan
- High and Low Pass Filter for Time Series in ViewPlan
- Mean Mass Transport - Averaging of 2D/3D fields in ViewPlan
- Velocity Profile in ViewPlan
- Downstream Projection for Velocities
- Velocity Rose in ViewPlan
- Improved Polyline Tool in ViewPlan
- Export Shapefile in ViewPlan
- N-S connectors by groups in ViewPlan
- Model Domain Rotation in ViewPlan
- Export XY data file as I,J
- EFDC Restart Options (Input) Improvements (EFDC and EE)
    - Continuation Runs
- Cruise Plot Comparisons
- Low Pass Filter for Model Analysis
- Wind Rose Plots
- Automated Atmospheric and Wind Series Weighting
- Base Date Updating
- Triangular Cells on Border
- Velocity Banners in View3D
- Blanking and Clipping in View3D
- Background Images in 3D
- Sediment Bed Viewing in View3D
- Mouse Inquire Information in View3D
- Changes to Waves Interface - SWAN Control and Linkage to EE System
- OMP the 3TL subroutines (EFDC)
- Metadata for Timeseries
- Photo Viewers in Time Series Forms
- Annotated Plan View of Moel Domain in Time Series Form

Enhancements to EFDC_DSI/EFDC_Explorer7.1 Capabilities

Release 16 December 2014

Updates and Modifications

- Removed WEB version option
- Updated writing of activation log file
- Changed to Get Time & IP location info base on server
- Updated Get Time Location with date time format to "YYYY/MM/DD"
- Updated to activation process so it is more similar to EE7.2

Bug Fixes

- Fixed flashing in the series input form time series data
- Corrected various bugs found in EE7.2 back into EE7.1
- Fixed a in bug water column opacity
- Fixed a problem with multiple size classes for SDSER type 1 series
- Fixed a conflict with time unit between EFDC and the parameter WQTSDT in C06 of wq3dwc.inp (EFDC)
- calheat (454): removed a coefficient of 0.2385E-6 (EFDC)
- calpuv2c: removed/added some variables in the list of PARALLEL DO PRIVATE (EFDC)
- CALTSXY: IF(KC == 1)CYCLE was removed (EFDC)
- WQ3DCONTROL: WQISMIN = 1.0E-8 ==> WQISMIN = 1.0 (EFDC)

Release 9 September 2014

Updates and Modifications

- Refinement of toxics (EE and EFDC_DSI)
- Changed unit of salinity from g/l to ppt
- Change getNettime reporting
- Added the ability to read/write Low-Chord BC Types
- Reading Time series ID Name
- Legends in View3D

Bug Fixes

- Corrections to toxics(EE and EFDC_DSI)
- Viewing of POC in ViewPlan
- LPT color issues in View3D
- Vertical slice issue in View3D
- BC constant concentration issue
- Get the ID name of series WQ
- Import cvl grid file
- Pasting excel into a time series form
- Get ID of *ser.inp old format file and minor bugs
- Reading Time series ID Name
- Issue for diagenesis time series

Release 18 August 2014

Updates and Modifications

- Updated the sediment transport input
- Added additional sediment QC prior to running the model
- Added QC when EE is reading/writing the CELL.INP file
- Improved Harmonic Tides utility
- Added the ability to view the new EFDC_DSI Sigma-ZED model results
- Improved calibration statistics reports
- Added default filenames for 3D graphics
- Added sediment diagenesis to the 3D graphics

Bug Fixes

- Fixed toxics series writing when intype=1
- Fixed a problem with DXDY.INP writing for certain cases
- Fixed units for toxins at the boundaries
- Timeseries of Sediment Flux issue
- Sediment_Flux_IC() issue
- Benthic flux issues (including block time values)
- Timeseries of Velocities issues
- Assigning BC cells to a polygon
- Format_Series of non-cohesives at intype=1 structure
- PropCopy feature for water depths < HDRY
- Losing the Velocity viewing option after using High frequency calibration reporting feature
- Corrected click to view value of sediment in vertical profile
- Corrected bug when importing time series *ser.inp
- Fixed Set_Bottom_Slope issue when assigning i,j directional slope

Release 27 June 2014

Updates and Modifications

- ViewPlan Extraction tool number precision
- Modified the GetNetTime
- Improved BC labeling
- Updated KML reading
- Added the new flow BC option of areal flux rate
- Added the ability for EE to write the QSER file with exponential format, if needed.
- Added more QA checks
- Added CVLGrid as a standard grid import option
- Update general statistics plot for every constituent
- Read qctl.inp with more options (EFDC_DSI)
- calqvs.f90 now parallelized (EFDC_DSI_OMP)
- Allowed EFDC.INP file to have precedence over .EE file when saving

Bug Fixes

- Corrected an issue with high frequency snapshots

- Corrected ViewPlan Water by Depth when changing elevation
- Corrected an issue with viewing blanking in 3D
- Add sediment color ramp on ViewProfile
- Toxics value on shown on sediment profile
- Toxics setting now available for any toxic class
- Fixed statistics when there is no data
- Fixed core's size <=0 issue
- Fixed nutrient limitation bugs
- Fixed the total FXVEGE/FYVEGE when partial vegetation penetration (EFDC_DSI)
- Fixed the Vegetative Resistance from AVG to TOT using FKC (EFDC_DSI)

Release 9 January 2014

Updates and Modifications

- Changed all dd-mmm-yyyy to yyyy-mm-dd format
- Added an update new release form (Check update)
- Updated time server for licensing
- Updated/corrected the sediment d50 calculation
- Improved startup time

Bug Fixes

- Full heat balance option (EFDC)
- Vertical Calibration report issue
- Sediment core editing issue
- 3D blanking issue
- Fixed Grid Cell Export for P2D file
- Could not show lines control when right-click on the legend
- Fixed Legend rump when not selecting the first line
- N-S connection issue
- Axis for Correlation Plots
- Bugs related to animation (grid on/off)
- problem with SEDZLJ artifacts in a file with no sedtran
- Bugs related to editing cell data
- Activation issues
- Explicit/Implicit default option

Release 8 November 2013

Updates and Modifications

- Updated time server for Licensing
- Added OMP Licensing on License processing
- Update npoints of VelZ = KC on Vertical profile
- Save and Load Contour FoodFill with .eev file
- Velocities 2D Planview, plot TimeSeries
- Export 2D plan view to EMF
- EFDC Generate/Cartesian on Elevation Options and Roughness with Channel Polygon
- Add Hide Legend Title and Border Line on 2D Profile

- 2GB file capability for EE_Arrays
- Remove redundant Save and Load button
- Save and Load Plot View for Layer 2 option

Bug Fixes

- Explicit/Implicit default option
- Fixed 3D View Model Results, Light Issue, Blanking and Legend
- Fixed view WQ issue and depth on PlanView and Calibration issue
- Fixed bug zoom factor issue, Save plot, Zoom inset
- Fixed Continuation Runs
- Time-series edit button disabled for WQ BC
- Fixed issue where active module was turned off automatically: Dye, salinity,...

Release 5 August 2013

Updates and Modifications

- Update to the Sediment Bed form
- Removed limit to the number of wind time series
- Added the 3D text rotation and added basic 3D symbols
- Made 3D labeling more consistent
- Improved the treatment of cell coordinates in double precision
- Improved the DXDY and CORNERS handling
- Updated the WEB version limits and functions
- Updated OMP licensing

Bug Fixes

- GVC functionality
- High-frequency snapshot for whole domain
- Merge continuation run issues
- Text for option buttons in Windows XP
- Flux checking file issue
- ViewProfile sediments bug
- Legend bug for Habitat Analysis for both viewing and exporting
- Arrowhead for wind when animating
- Wave settings update issues
- Lght extinction during reading of transitional files (between 7.0 and 7.1 final)
- Bug with DXYCVT
- ISEDINT problem when changing sediment properties

Release 4 July 2013

New Features

- View3D - 3D visualizations
    - Lighting effects
    - Blanking of cells
    - Automated animation options

- Contour lines in ViewPlan
- Contour lines ViewProfile
- Velocity magnitude by color in ViewProfile
- High-resolution data snapshots
- SWAN control and linkage to EE system
- Harmonic constants
    - Simple Harmonic Forcing
    - Astronomical Tide Forcing
- Lagrangian particle tracking by time release
- Status error window
- Zoom pan inset function
- Display timing frame in Time Series and Profile Plotter
- Flux line calculation
- Save plot function
- Updated EFDC to WASP7 linkage

Enhancements to EFDC_DSI/EFDC_Explorer7 Capabilities

Release 21 January 2013

Bug Fixes

- Bug fix for toxics model linkage in EE
- Minor usability issues

Release 10 December 2012

Updates and Modifications

- Improvements to toxics interface and correction of mislabeled units
- Modifications to display of LPT
- Correction to legend in Planview
- Activation improvements
- Change from 1 to 3 decimal places for dxdy

Release 8 November 2012

Bug Fixes

- Modifications to activation processes

Release 17 September 2012

Bug Fixes

- Fixed problems of allowing the user to specify layer options when viewing extinction coefficients
- Fixed inability to re-scan output with Planview button.

Release 21 August 2012

Bug Fixes

- Fixed Withdrawal/Return editing function (cleaned up the add/removal)
- Fixed the plotting of BC symbols on 2D map
- Cleaned up the BC popup menu (RMC'ing)
- Cleaned up the vertical profile options form to eliminate settings that are not available when plotting profile lines
- Fixed a problem generating WQWCRST.INP file when the user deactivates a cell then saves the model
- Fixed a problem generating WQWCMAP.INP file when the user deactivates a cell then saves the model
- Cleaned up the BC summary form to properly work with W/R BC's when constant flows are used.

Release 30 July 2012

Updates and Modifications

- Added ability to assign bottom roughness from data file and interpolate over entire model domain or inside polygon

Bug Fixes

- Corrected specified benthic flux when using multiple zones
- Corrected SOD temperature factor
- Corrected water quality issue for light attenuation in EFDC_DSI
- Corrected problems related to automated plotting
- Corrected several minor usage issues

Release 25 May 2012

Updates and Modifications

- Major streamlining and simplification of the user interface.
- Updated the EFDC_DSI/ EE7 modeling system to include a Rooted Plant & Epiphyte Model (RPEM).
- Provided capability to output bitmap images at user defined resolution.
- Included EE User Manual Help file coupled to forms (F1).
- Added ability to write KML files for grid and model 2D fields.

- Added compass (north arrow) to ViewPlan.
- Model Results Analysis Macro for consistent plots and tables.
- New Group Method for LPT implemented. Multiple Timing Frames for viewing wind and flow at various locations in ViewPlan.
- 2D ViewPlan results at specified depth or elevation.
- Output time series at a specified depth. Automated statistics and plots at end of model run.
- Automated folder structure for saving output files, plots etc.
- Vector Plots – anchor point for vectors. Regular grid extraction for velocity plots.
- Further developed ability to user multiple processors (OMP) to significantly reduce run times (see Section 10).
- Start EE by double clicking on an EE project file (with .ee extension).

Enhancements to EFDC_DSI/EFDC_Explorer6 Capabilities

Release 14 November 2011

Updates and Modifications

- Added automatic checking for Unix/Linux Cr/LF and allow for conversion
- Set the default for vertical turbulence limit option as “limit RIQMAX”
- Added additional QC when loading a MASK.INP file
- Improved the importing of legacy PSER.INP file formats
- Improved the handling of sediment snapshots when sediment bed layer output file uses sediment skip count
- Improved the handling of when sediment classes are turned on/off
- Cleaned up the initialization of Lagrangian Particles and added the ability to delete user defined LPT groups
- Added more QC checking for forms and prior to running EFDC

Bug Fixes

- Corrected activation messages (Windows XP)
- Corrected method for collection of user information during activation
- Fixed the loading of the CELL.INP when the number of columns exceeded 640
- WQ Model - Fixed integer overflow for large IC and JC when array sizes are a fn(IC*JC)

Release 30 August 2011

Updates and Modifications

- Corrected Windwave and wave linkages:
    - Modified EE6 and EFDC_DSI_6 so that it always requires Ks (Nikuradse sand roughness value) whenever modeling any kind of wave action
    - Corrected problem with ISWAVE = 2 and 4 when modeling non-cohesive sediment transport.
    - Corrected some bedshear issues.

- Improved EE6 user interface to work better with wave options when linking to external models, as well as for internal wind wave models.

Bug Fixes

- Bug fix for sediment core log which division by zero.
- Bug fix for conflict of shortcut keys F1 & F2 in Planview and Timeseries views.
- Corrected EE6 so it now recognizes whether OMP or Single threaded EFDC_DSI is being used.
- Modified EFDC_DSI_Single so that it correctly reports Single threaded CPU times.

Release 22 August 2011

Updates

- Updated EFDC_DSI to internally compute bed shear stress due to wind generated waves.
- Updated EFDC_DSI to internally compute bed shear stress and currents due to wind generated waves.
- Updated EFDC_DSI to include recent EFDC enhancements by EFDC development partners including sediment transport, SEDZLJ and hydro-mechanical devices (HMK).
- Addition of Withdrawal/Return Boundary Condition for reversing flows (i.e. bi-directional flows)
- Ability to compare water column input and model results between models.
- Ability to compare sediment bed conditions, bed shear stress and scour/deposition between models.
- Gradient fill as a display option for 2D plan view plots.
- Ability to output sediment bed layer data to the EE_BED.OUT file with a skip frequency to save disk space.
- Ability to Drag & Drop EFDC.INP files or Project Directories onto the Main EFDC_Explorer form to open a project.
- Ability to Drag & Drop model annotation files (overlays, labels and postings) while viewing the model
- Ability to calculate current time or time series of Mass Fluxes across any user define polyline(s).
- Ability to compute the location of a “target concentration” of any water column constituent along a user specified polyline, .e.g. river mile location of 2 ppt salinity.
- Ability to read, write and display ESRI® .shp files.
- Ability to read, write and display Mapinfo® .tab files.
- Ability to user multiple processors (OMP) to significantly reduce run times.

Enhancements to EFDC_DS/EFDC_Explorer5 Capabilities

Release 2010_10_21 Version

Updates

- Added license management and copy protection to the FULL version of EFDC_Explorer (EE).
- Added the ability for Withdrawal/Return Structures to have +/- flows for bidirectional structures (EFDC_DS).
- Added the ability for Withdrawal/Return Structures to be used to display model forcings in the EE Timing Frame (EE).
- Added the ability to compute and display scour/deposition even when not using the bed morphology option (i.e. IMORPH=0) (EE).
- Restructured the EE_BED writing process to reduce its file size (EFDC_DS/EE)
    - Reducing the parameters saved by EE internally computing mass fractions
    - Added the ability to specify a snapshot interval greater than the water column interval for the sediment bed file.
- Major reduction in the time needed for file reading/writing (EE), i.e. significantly speeds up post-processing.
- Added the ability to plot 2D discharge vectors (Vel*Dx*Depth) (EE)
- Changed the Run Time Status display to allow more specification of EFDC parameters (EFDC_DS/EE)

  0-TSS, 1-Salinity, 2-Temp, 3-Dye, 5XX-Toxics, 6XX-SEDs, 7XX-SNDs, 8XX-WQ Variables where XX represents the two digit sub-parameter number, e.g. 601 is SED class 1, 702 SND class 2, 819 is Dissolved Oxygen Special cases are 600 and 700 which provide the total SED's or the total SND's, respectively.
- Added mouse wheel zooming feature
- Added the ability to display polylines and polygons underlying the model domain
- Added more line symbols and formatting controls

Patches

- Fixed the mass loading table for the water quality parameters
- Fixed adding Withdrawal/Return time series using the "Import Data" feature of the BC series editing form.
- Fixed the manual addition of the Withdrawal/Return time series.
- Fixed the Timeseries of bed shear stresses
- Fixed the import of water quality data when using the HSPF data import form.
- Fixed the generation of WQ3DWC.INP files when flow boundary groups have zero flows.

Release 2010_08_19

Upgrades

- Added license management and copy protection to the FULL version of EFDC_Explorer.
- Added the ability for Withdrawal/Return Structures to have +/- flows for bidirectional structures (EFDC_DS).

- Added the ability for Withdrawal/Return Structures to be used to display model forcings in the EE Timing Frame.
- Added the ability to compute and display scour/deposition even when not using the bed morphology option (i.e. IMORPH=0).
- Restructured the EE_BED writing process to reduce its file size (EFDC_DS/EE)
- Reduced the parameters saved by EE internally computing mass fractions
- Added the ability to specify a snapshot interval greater than the water column interval for the sediment bed file.
- Major reduction in the time needed for file reading/writing.
- Added the ability to plot 2D discharge vectors (Vel*Dx*Depth).
- Changed the Run Time Status display to allow more specification of EFDC parameters (EFDC_DS/EE)
    - 0-TSS, 1-Salinity, 2-Temp, 3-Dye, 5XX-Toxics, 6XX-SEDs, 7XX-SNDs, 8XX-WQ Variables where XX represents the two digit sub-parameter number, e.g. 601 is SED class 1, 702 SND class 2, 819 is Dissolved Oxygen
    - Special cases are 600 and 700 which provide the total SED's or the total SND's, respectively.

Patches

- Fixed adding Withdrawal/Return time series using the "Import Data" feature of the BC series editing form.
- Fixed the manual addition of the Withdrawal/Return time series.
- Fixed the Time-series of bed shear stresses.
- Fixed the import of water quality data when using the HSPF data import form.
- Fixed the generation of WQ3DWC.INP files when flow boundary groups have zero flows.

Release 2010_04_02

Upgrades

- Added the ability for JC to be > 999 and <= 9999. This feature requires using both an updated EE and an updated EFDC_DS.
- Added a new mass flux tool for any water column constituent
- Added the ability to change the NSED, NSND and KB parameters without losing settings
- Improved the importing of sediment time series files when different # of classes are used
- Added the "Go to Time" option when viewing plots by RMC'ing on the "Timing Frame"
- Added the Velocity Components to the automatic calibration plots/statistics
- Added the ability to zoom to a specified IJ or L index (Plan view - Alt-V)
- Added additional sub-selection criteria while selecting cells using polygons during editing
- Previous versions of EFDC_Explorer have been able to compute water column statistics within user defined regions. To save post-processing time have added the ability to report the results for each polygon (i.e. region) in the file or all regions combined
- Added limited support for the Jet/Plume BC
- Added the Group and Cell plotting function for the Withdrawal/Return BC
- Enhanced the Cell/Group plotting function for the Hydraulic Structure BC
- Improved the EE creation and editing of Hydraulic Structure BC's.
- Added Relative RMS to the calibration error statistics reporting options

Patches

- Fixed the printing for the series/profile plots
- Fixed group plotting for the hydraulic structure BC type
- Fixed EFDC_DS dynamic allocation feature for withdrawal/return boundary condition type.
- Fixed diffusion as a result of hydrodynamic dispersion due to horizontal momentum diffusivities (EFDC_DS).
- Fixed the Importing of the CH3D Waterways Experiment Station (WES) and University of Florida (UF) versions
- Fixed the vertical profile plotting feature for extracting velocity profiles.

Release 2009_11_01

Major Upgrades

- EFDC_DS has been upgraded to compute **Lagrangian Particle Tracking (LPT).** EE has also been upgraded to incorporate the pre- and post-processing of the LPT's**.** The EE pre-processing provides full control for initial particle seeding, LPT computational option selection and plotting. The EE post-processing provides for a range of display options for the tracks, animations to the screen and or AVI files, and the ability to export any or all of the particle tracks to ASCII files. It also included the following major options
    - Particles are free to move in full 3D,
    - Particles can be fixed at a user specified depth, and
    - A random walk component can be added to either of the two options above.

- EFDC_DS/EFDC_Explorer has several options for incorporating wave effects. Most recently EFDC_DS has been enhanced to include the ability to **internally compute wind wave impacts, including bed shears** (ISWAVE=3). This option allows simulation of wave effects and resuspension of sediments. EFDC_DS uses the standard wind time series (WSER.INP) and the fetch (automatically computed by EFDC_DS) for each cell to compute the wind waves. These results are then used to calculate total bed shear stress. The final bed shear stress is the result of combining water current with the wave impacts via the Grant Madsen approach. For certain water bodies, this option eliminates the need to import externally computed wave parameters. The post processing of the wind wave results, including fetch for each sector for which the wind is blowing may be viewed in EE's ViewPlan.

- EE has now included the ability to **generate correlation plots between the model and existing data** to assist the user in Model Calibration. The method for setting linkages is the same as that for "Time Series Comparisons," however, with the **Correlation Plots** the user is able to select which error statistics will be displayed on the plot. Error statistics which may be displayed include:
    - R Squared
    - Average Error
    - Absolute Error
    - RMS Error
    - Relative Error
    - Nash-Sutcliffe Efficiency Coefficient, and/or
    - Relative RMS Error

Minor Upgrades

- Changed output file loading box. The user may choose to load or not to load model results when displaying the model grid/initial conditions with ViewPlan. Once results are loaded the user may reload them if necessary. This change has been made as EE now uses file pointers, making the previous function redundant.
- New Water Quality calibration variables have been added. Total Suspended Solids (TSS), previously included only inorganic solids, but now also includes organic solids. The old Inorganic Suspended Solids is now called TSSi. Total Kjdedal nitrogen has also been added as a WQ variable.
- Bed shear stress was formerly displayed as subsection but now it has a separate drop down menu in the Viewing Option of ViewGrid.
- The size of the plot box for each plot is now saved for Calibration Plots. This means that even though screen aspect ratios may change between different computers, they will still produce the same size/aspect ratio for the calibration plots. CTRL W sets the size of the box for each type of calibration plot, and this will be retained when the user saves the project.
- Ability to import RGFGrids grids with multiple sub-domains. Previously EE assumed there was only one sub-domain in the imported grid. With this update, when the user tells EE to check for disconnected sub-domains EE will generate an IJ map of the cells with discrete subdomains. EE then allows the user to create the manual North-South face cell connections and save the information in the MAPPGNS.INP file.
- Added the ability for JC to be > 999 and <= 9999. This feature requires using both an updated EE and an updated EFDC_DS.
- Added a new mass flux tool for any water column constituent
- Added the ability to change the NSED, NSND and KB parameters without losing settings
- Improved the importing of sediment time series files when different # of classes are used
- Added the "Go to Time" option when viewing plots by RMC'ing on the "Timing Frame"
- Added the Velocity Components to the automatic calibration plots/statistics
- Added the ability to zoom to a specified IJ or L index (Plan view - Alt-V)
- Added additional sub-selection criteria while selecting cells using polygons during editing
- Previous versions of EFDC_Explorer have been able to compute water column statistics within user defined regions. To save post-processing time have added the ability to report the results for each polygon (i.e. region) in the file or all regions combined
- Added limited support for the Jet/Plume BC
- Added the Group and Cell plotting function for the Withdrawal/Return BC
- Enhanced the Cell/Group plotting function for the Hydraulic Structure BC
- Added Relative RMS to the calibration error statistics reporting options

Patches

- Fixed the printing for the series/profile plots
- Fixed group plotting for the hydraulic structure BC type
- Fixed EFDC dynamic allocation feature for withdrawal/return boundary condition type.
- Fixed diffusion as a result of hydrodynamic dispersion due to horizontal momentum diffusivities.
- Fixed the Importing of the CH3D Waterways Experiment Station (WES) and University of Florida (UF) versions

Release 2009_04_11 Version

Major Upgrades

Added a new approach for specifying water quality parameters at flow type boundary conditions in both the EFDC_Explorer/EFDC system. In prior versions, EFDC required mass loadings to be specified for the HEM3D sub-model (i.e. WQPSL.INP). **EFDC_Explorer and EFDC have been enhanced to allow the specification of parameter concentrations, instead of mass for the water quality sub-model.** This has always been how the salinity, temperature, dye, sediments and toxics boundary conditions have been specified. Only the water quality sub-model used mass loadings. In prior versions of EFDC_Explorer, the user specified concentrations for the water quality parameters and when saving the model files, EFDC_Explorer computed the appropriate mass loadings for each flow type boundary condition. For most applications this approach worked well. However, for boundary groups with either highly variable flows or with flows alternating into and out of the model domain the WQPSL.INP files had to be generated with small time steps (hourly or less), producing huge files for run lengths of a year or more. Allowing EFDC to use the flows and concentrations directly eliminated these problems. This approach also enables the user to review the physically meaningful concentrations in the input files (as a QA check) instead of the more abstract mass loadings.

New EFDC_Explorer support for **withdrawal/return** boundary condition type. Extended the EFDC_DS functionality of the withdrawal/return boundary to the water quality model.

The user can now **compare EFDC model results** in 2D plan view for any of the water column parameters or sediment bed results, even if the grids are not the same. EFDC_Explorer can report the differences as either a snapshot or animations of the differences.

Added a **bottom irradiance compliance analysis** tool to compute the amount of light penetration as a function of compliance zones, minimum solar radiation levels, and depths.

A new boundary condition summary **table of mass loadings** can be generated for each boundary group by parameter.

Updated and corrected the computation of **algae light limitation and optimal light** when using the solar radiation in the ASER.INP file. If the user selects IWQSUN=2 (use the hourly solar radiation in ASER) the diurnal fluctuations of algae due to growth and respiration are simulated. A new option, IWQSUN=3, has been added to use the solar radiation in the ASER.INP data to compute the daily average solar radiation. This new option produces equivalent results to the use of the IWQSUN=1 option which requires an externally computed daily average solar radiation value. Diurnal fluctuations of algae and dissolved oxygen are only simulated if IWQSUN=2. For all other light limitation options a daily average growth rate is applied for the entire day, which is the approach used by WASP.

Minor Upgrades

- **Fixed the compatibility problem with Vista** that required the user to run EFDC_Explorer in the "Administrator" mode. The new approach allows the user to run EFDC_Explorer as a normal user in Vista, Windows XP and Windows 7.
- Sped up the EFDC_Explorer configuration loading and saving.
- The user can save and reuse time series extraction points for ease of generation of time series plots. Use the Alt-I to load points and Alt-O to save the current points when viewing the model in the ViewGrid view.

Release 2008_03_31

EFDC Model Compatibility

- Upgraded EE3 to pre- and post-process the GVC version of EFDC released by EPA (Version 1.01, http://www.epa.gov/ceampubl/swater/efdc/index.htm).
- Upgraded the linkage to the Dynamic Solutions-International version of EFDC (EFDC_DS) to accommodate the EFDC_DS additional features.

EFDC_Explorer3 Main Form

- Added user control over the EFDC input data field smoothing feature.
- Added user control over Masks.
- Continue to add Tooltips and helps on inputs.
- Added more data checks to help ensure valid runs. For example, checking the ASER.INP and WSER.INP starting and ending times valid with respect to the model start and end times.

File Access and Management

- Rewrote the binary file access method to allow the access to files > 2.1GB. Should allow access to files up to 400GB or more (though not recommended).
- Increased the number of snapshots that can be managed/used to > 100,000.
- Enhanced the file resampling (i.e. reduce an EFDC output file size) feature.
- Enhanced the merging of two output files from sequential runs.

Boundary Condition List/Summary

- Added more BC information to enhance BC review/QA.
- Fixed the tide plotting feature.
- Added the direct access to the harmonic tide management form.
- Added the ability to generate spatially interpolated time series for open boundary conditions.

Water Quality

- Added the open boundary condition feature for water quality simulations.
- Added the ability for the user to write the EDFC mass loadings (i.e. WQPSL.INP) for any fixed time step.
- Cleaned up and enhanced numerous forms and features.
- Added the ability (to EFDC_DS and EFDC_Explorer) to account for POM light extinction.

Mass Balance/Boundary Loadings

- Added the ability to compute mass balance of various model constituents with plotting and tabular output of time series.
- Added the ability to plot the boundary condition loadings for various model constituents or some derived parameters like Total Phosphorus, Total Nitrogen or Total Carbon.

Model Calibration

- Cleaned up and enhanced the model data/model comparison plots for time series and vertical profiles.
- Added the ability to compute and report model calibration statistics using RMS, average error, absolute error and/or relative error.

- Added the ability to automatically generate the calibration plots using the current plot settings

English/Metric Units

- Added the ability to report most of the plots and tables in either Metric or English units. Alt-M toggle between the display units. The model inputs are still metric.

Grid Tools

- Added the ability to export the current loaded model's grid as a Delft RGFGrid formatted file (i.e. GRD file) for use with the RGFGrid utility.
- Added the ability to export the model domain outline as a XY file (P2D format).
- Added the ability to export the model cells as a XY file (P2D format).

Plan View

General Features

- Fixed the ability to properly save the bitmap background when animating and have multiple bitmaps per background.
- Added formatted labels.
- Added coordinate grid overlays.
- Added the ability to specify the form size in centimeters (Ctrl-W).
- Added the ability to save/restore layout data, form size, legend position, scale position and timing frame position (Alt-K to save, Alt-L to load).
- Navigate view with +/- for zooming and arrow keys for panning.
- Set pan/zoom steps (F2).
- Added the ability to overlay most all model results displays with the velocity vectors or cell IJ or L labels.
- Added the ability to plot the color ramp in grey scale (for publications).
- Added the ability to toggle the display of titles (for reports and publications).

Bottom Elevations/Bathymetry

- Transparent Cells for with grid lines colored by elevation.

Longitudinal Profiles

- Added the ability to generate longitudinal plots of water column and bottom sediments.
- Allow user specified layer averaging (e.g. "1-3" will average the bottom three layers).
- Allow profiles with water column or bottom sediment data overlaid with bottom topography and/or water surface elevation/depth results and/or bed shear.
- Added the ability to plot the color ramp in grey scale (for publications).
- Added the ability to toggle the display of titles (for reports and publications).

Calibration Data

- Added the ability to overlay the 2D plots with the calibration data (or residuals) contained in the Time Series and Vertical Profile Calibration data definitions.
- Can overlay the following data/information:
  - Station ID,
  - Time sensitive data values,
  - Time sensitive data residuals, and
  - Data values and residuals can use the same depth averaging or specified layer options specified for the model results.

Water Levels

- Transparent Cells for water depths/elevations and other water column results.
- Flood Inundation Mapping
  - Compute/Display areal extents based on a minimum depth.
  - Compute/Display areal extents based on a Depth*Velocity Flood Hazard Factor.
  - Compare up to 3 models on the same plot showing Areal Extents.
- Energy Mapping
  - Compute/Display total head (depth + v^2/2g).
  - Compute FEMA Overtopping parameter (depth + v^2).

Cell Indices

- Manual Cell Index Labeling.

Model Metrics

- Grid Orthogonality map & statistics,
- Cell angle maps,
- Courant Number,
- Courant-Friedrichs-Levy (CFL) time step limits,
- Froude Number,
- Densimetric Froude Number,
- Celerity, and
- Richardson Number.

Velocities

- Added the ability to plot/label velocities in m/s, ft/s, mph or knots.
- Added the ability to map the vertical velocities over the model domain by layer or depth averaged.
- Added the ability to map the velocity magnitudes over the model domain by layer or depth averaged.
- Added vector skipping by I and J.
- Added the ability to file to plot/label velocity vectors only at user defined XY's.
- Added the ability to label velocity vectors with magnitude.
- Velocity Statistics on I/J and X/Y & Z components and magnitude.

Light/Solar Radiation Penetration

- Added the ability to plot/label Secchi Depths computed from light extinction coefficients.
- Added the ability to plot/label light extinction coefficients.
- Added the ability to plot/label percent irradiance at a user specified depth.

Model Generation

- Added the ability to import the DELFT RGFGrid formatted file.
- Added the ability for EE to export a DELFT RGFGrid formatted file from an existing EFDC model grid.
- Added the ability to import a grid from SEAGRID.
- Added the ability to import a grid from cell nodal data.
- Cleaned up the grid import process.

Model Comparison

- Compare velocities between two model (must be the same grid).
- Compare velocities between the model and data.
- Compare Water Depths.
- Compare Bottom Elevations.
- Compare Inundation Area.
- Compare Flood Hazard.

Boundary Condition Editing/Management

- Cleaned up the application of a rating curve to a boundary group.
- Added the Unit Discharge sub-options for the Hydraulic Structure BC Type.
- Added the ability to plot/show the upstream and downstream Hydraulic Structure cells.

Ongoing Bug Fixes

- Continued the process of fixing bugs and making the inputs and processing more robust

Enhancements to EFDC_DS 2006_10_08

- Added POC/POM light extinction to the water quality and heat sub-model (only activated in the equilibrium temperature sub-model ISTOPT(2)=4)
- Added the ability to compute the age of water in a model domain (e.g. residence times).
- Continued to update and make bug fixes to the EFDC code that DS-INTL has found as well as those reported to us by other users.
- Converted the main EFDC_DS runtime file from Compaq's FORTRAN to Intel's FORTRAN.
- Added the command line switch "-NOP" to skip the pause/prompt at the end of a run to allow batch files to be set up with multiple runs.
- Made the FORTRAN source code for our DS version available to every user.