**IWDW tools**

Emissions Review Tool (ERT):  Generates “dynamic” charts of annual emissions for WAQS modeling platforms.  Spatial aggregations are at the county and state levels.  Pollutants are grouped by chemical species and source categories.  County level source categories can be displayed at the Source Classification Codes (SCCs) level.

Model Performance Evaluation Plots (Image Browser): Browser to display “static” AMET generated plots use for WAQS MPE.  Plots include emissions, meteorological modeling and PGM output. Plot types include spatial, time series, bar, soccer, scatter plots, etc.  Spatial aggregations include 4 and 12km domains. Temporal aggregations include annual and monthly averages, with hourly, 1hr max, 8hr max comparisons at monitoring sites with continuous criteria pollutant monitoring.

Model-to-Observation Comparison Tool (Model-to-Obs): Dynamic display of PGM output paired to observational data.  Pairings can be aggregated by observational network.  Time series chart can be filtered by date range.  The tool provides monitoring site level comparisons to modeling output that may not be available with in a static plot browser.

Monitoring Data Tools (Reports): Includes pre-defined chart types for visibility, O3, wet and dry deposition.

Source Apportionment Tool (SA): Dynamic charts to display SA modeling results. Source category specific contribution to MDA8 at monitoring sites (in 4km DSAD and by States and regions in 12km domain)

GIS Tools:  Two types of GIS tools are under development:  Selection of geographic regions (e.g. monitoring site, county and other areas of interest) as a user interface (UI) to enable data selection for the tools listed above.  This UI could also be used to display metadata related to geographic regions (such as county or state level emissions).  Another application for a GIS tool is to produce “layered” displays of either gridded and/or point data, including model output and observational data.  Such a tool could be used to create dynamic spatial aggregations of model output.



**Figure 1.** IWDW tool deployment timeline

**Table 1. IWDW tool development and deployment planning[[1]](#footnote-1)**

| **Tool** | **Version** | **Current functionality & future enhancements** | **Modeling platforms** | **Obs. data** | **Target release date** |
| --- | --- | --- | --- | --- | --- |
| ERT | v1 | Dynamic browsing of WAQS emissions data at chemical species and State, county, SCC levels | 2008b, 2008\_2020  2011a, 2011b |  | 9-23-15 |
| v2 | Enhancements: Source category and parameter aggregation metadata; multiple platform display; charts at SCC level; refactor State ordering; speciated VOCs (need to address sectors w/o VOC speciation, e.g. biogenics. Could apply to anthro sources with VOC speciation)  Bug fixes: SCC max query string; multiple platform selection; platform specific labels; select box text truncation | 2011b, 2011b\_2020 |  | TBD |
|  |  |  |  |  |  |
| MPE | v1 | Display of static images used for WAQS modeling platform MPE. Includes met, emissions, and PGM plots for release platforms and related sensitivity studies | 2008b, 2011a, 2011a\_GCBC, 2011a\_MOVES, 2011a\_WinterO3, (2011) WRF, 2011b |  | 9-23-15 |
| v1.1 | UI update and support for new image file naming convention |  |  |  |
| v2 | Enhancements: dual plots, metadata enabled plot selection; daily emissions spatial plots for VOC species; batch plot download | 2011b (CAMx, CMAQ) |  | TBD |
|  | | | | | |
| Model-to-obs | v1 | Dynamic time series plots of model-to-obs data pairings generated using AMET and sitecompare.f | 2008b | AQS, CASTNet, CSN, IMPROVE | 9-23-15 |
| v2 | Enhancements: map based site selection; additional chart types (scatter, spatial stats, tile plots, soccer); statistics output (r2, NME, NMB, etc.); State ordering; filtering for diurnal trends | 2011a, 2011b (CAMx, CMAQ) |  | TBD |
|  |  |  |  |  |  |
| SA | v1  (v1.0.1.2) | Current: Source category specific contribution to MDA8 at monitoring sites (in 4km DSAD and regions in 12km domain) | 2008b |  | 9-23-15 |
| v2 |  | 2011a |  | TBD |
| v3 |  | 2011b (CAMx, CMAQ) |  | TBD |
|  |  |  |  |  |  |
| Summary reports (general) | v1 | pre-defined displays of observational data; single-site selection using Google map UI |  |  | 9-23-15 |
|  | v2 | GIS based single/multiple site selection; select sites by other criteria (e.g. proximity to geographic regions –CIAs, urban/rural characteristics, elevation, O&G basin proximity) |  |  |  |
|  |  |  |  |  |  |
| Visibility | v1 | RHR metrics (are these relevant to IWDW-WAQS?) |  | IMPROVE dv | 9-23-15 |
|  | v2 |  |  |  |  |
|  |  |  |  |  |  |
| Ozone | v1 | Trends, exceedances |  | AQS hourly | 9-23-15 |
|  | v2 | Enhancements: apply 70ppb O3 standard |  |  |  |
|  |  |  |  |  |  |
| Wet Dep | v1 | S, N trends and composition |  | NADP NTN | 9-23-15 |
|  | v2 |  |  |  |  |
|  |  |  |  |  |  |
| Dry Dep | v1 | S, N trends and composition |  | CASTNet | 9-23-15 |
|  | v2 | Enhancements: add PM, Hg dep |  |  |  |
|  |  |  |  |  |  |
| Other reports? |  | Phase I, Phase II O&G inventories and projections |  |  |  |
|  |  | WAQS O&G sectors vs. NEI |  |  |  |
|  |  |  |  |  |  |
| GIS tools |  | ERT: enable selection by user defined geographic region(s); dynamic aggregation by selected regions; display gridded (premerged and SMOKE output)  ERT GIS: display gridded emissions by parameter/source category to look for discrepancies across State/County boundaries; implement emissions pie chart overlay (prototype provided by Zac) |  |  | Demo |
|  |  | MPE: combine PGM output and monitoring data layers |  |  |  |

1. Revisions: Green text shows planned tool updates, Orange text show tool updates since the last Tools Workgroup call (Oct 20, 2015). [↑](#footnote-ref-1)