HEM version 4.1 (September 13, 2021)

Bug Fixes

Item	Modification	HEM4 Sections Affected
1	Added an error message to inform the user when there are source IDs in the Emissions Variation file that are not in the Emissions Location file.	Run HEM4 - Selection of Emissions Variation file
2	Added an error message to inform the user when they try to load an improperly formatted Emissions Variation file.	
3	Changed FacilityPrep.py to ensure that buoyant line sources appear last if sources other than buoyant line sources are being modeled. This was done in response to a bug in AERMOD v19191 but was kept in HEM4 even though AERMOD v21112 is now used.	Run HEM4 - Selection of Buoyant Line Parameters file
4	Changed the validate function in BuoyantLine.py to allow zero values for the building separation distance.	
5	Removed the ability to have an empty buoyant line group ID in the buoyant line parameter file. This ID must now be filled in if that source type is used.	
6	Added a validation check in BuoyantLine.py to ensure that all parameters in the Buoyant Line Parameter input file for a given group are the same.	
7	Changed a validation function to allow spaces in the start and end Period lists.	Run HEM4 - Selection of Facility List Options file
8	Added "CO" option to the pdep and vdep columns in the Facility List Options input file. This allows "concentration only" data by emission type (particle or vapor) to be output when deposition or depletion is being used for the other emission type. Also allows concentrations by emission type to be output without having to enter deposition/depletion specific parameters.	
9	Changed the validate function in Downwash.py to allow zero-valued parameters.	Run HEM4 - Selection of Building Dimensions file
10	Changed AllReceptorGenerator.py script to output a csv formatted file. HEM4 runs for a large number of facilities could overflow an Excel output file.	Run HEM4
11	Corrected a bug in AllOuterReceptors.py that would sometimes create an empty extra outer receptor file when multiple outputs are needed.	Run HEM4
12	Corrected how the number of outer all receptor "batches" are computed. Used ceiling function instead of int and round.	Run HEM4
13	Updated Page.py to correctly determine if user selected "Cancel" when browsing for a file or directory.	Run HEM4
14	Added a check that "P" type user receptors (user supplied) do not contain an "S" or "M" in their receptor ID. This will allow them to be considered for the MIR.	Run HEM4

15	Added a check to ensure duplicate lat/lons or block IDs are not selected from the census data as receptors.	Run HEM4
16	Included pop-up message that HEM4 has been aborted when user aborts before AERMOD starts.	Run HEM4
17	Enabled AcuteMaxPopulated.py and AcuteMaxPopulateNonCensus.py to consider user receptors as candidates for the maximum value.	Run HEM4
18	Corrected FacilityMaxRiskandHI.py so that it will compute the correct total incidence value for a facility that uses vapor/particle specific concentrations.	Run HEM4
19	Corrected SourceTypeRiskHistogram.py to display the sector max risk in the Maximum Risk column and not just the max of the source types.	Summarize Risks - Source Type Risk Histogram summary
20	Corrected MultiPathway.py and MultiPathwayNonCensus.py to first convert lowercase pollutant names before doing a merge between the risk breakdown dataframe and the crosswalk dataframe.	Summarize Risks - Multipathway summary
21	Corrected a bug in MultiPathway.py that was preventing the module from running correctly when arsenic was present in the inputs.	
22	Corrected the syntax in MaxRisk.py, Histogram.py, and HI_Histogram.py to drop rows from the respective dataframes where population = 0 and the block id does not contain “U” (user receptor). Previously, user receptors were being dropped.	Summarize Risks - Max Risk and Hazard Indices summary - Risk Histogram - Hazard Index Histogram
23	Changed Histogram.py and HI_Histogram.py to count facilities in the tally whose maximum risk or HI occurs at a user receptor.	Summarize Risks - Risk Histogram - Hazard Index Histogram
24	Corrected bugs that prohibited RiskBreakdown.py and two of the Summary programs from working correctly when alternate receptors are used.	Summarize Risks
25	Changed the CancerDrivers.py summary program to sum the risk breakdown file by facility/source/pollutant before determining the drivers. This keeps a risk breakdown file containing particle and vapor parts from causing the cancer driver program to list two values per facility/source/pollutant.	Summarize Risks - Cancer Drivers
26	Fixed the Revise button in the Census Updater so that it cannot be used until an update file has been uploaded.	Revise Census Data
27	Changed the HazardIndexDrivers.py summary program to sum the risk breakdown file by facility/parameter/source/pollutant before determining the drivers. This keeps a risk breakdown file containing particle and vapor parts from causing the HI driver program to list two values per facility/parameter/source/pollutant.	Summarize Risks - HI Drivers

28	Changed MultiPathwayNonCensus.py, MaxRisk.py, Histogram.py, HI_Histogram.py, and SourceTypeRiskHistogram.py to allow 0 population receptors to be counted when alternate receptors were used during the modeling.	Summarize Risks - Multipathway - Max Risk and Hazard Indices summary - Risk Histogram - Hazard Index Histogram - Source Type Risk Histogram
29	Changed MaxConcentrationLocator.py to call AllInnerReceptorsNonCensus.py and AllOuterReceptorsNonCensus.py when alternate receptors were used in the modeling.	Summarize Risks - Maximum Concentration Locator
30	Fixed bug in the in_box function of CensusBlocks.py that was incorrectly removing duplicates while building the inner and outer receptor lists.	Run HEM4
31	Corrected FacilityMaxRiskandHINonCensus.py so that it will compute the correct total incidence value for a facility that uses vapor/particle specific concentrations.	Run HEM4
32	Fixed a bug in FacilityPrep where UTM coordinates from a user receptor file were not being rounded to integers.	Run HEM4

Enhancements

Item	Modification	HEM4 Sections Affected
1	Incorporated Aermod v21112.	Run HEM4
2	Revised HEM4 to allow the use of buoyant line groups and edited the format of the buoyant line parameters input file to reflect that.	Run HEM4
3	Added two new options to the Summarize Risks module 1) *Max Concentration* - Get the maximum pollutant concentration for each facility for a user-selected pollutant. 2) *Max Risk and HI by Source and Pollutant* - Get the risk, incidence, and noncancer hazard quotient (HQ) by source type and by pollutant, within each modeled facility.	Summarize Risks
4	Rearranged and reformatted the Summarize Risks module to separate the options based on whether they are facility specific or based on the contributions of all facilities.	Summarize Risks
5	Added a Community Assessment module that estimates populations within various demographic groups for user selections of distance and risk level.	Community Assessment (new)
6	Added a module (EJDash) to visualize the outputs of the Community Assessment module in a web browser.	Analyze Outputs

7	Revised the Analyze Outputs module that allows visualization of HEM4 summary outputs in a web browser: 1) Added tabs for each risk summary section in the app 2) Expanded the interactivity of the facility map 3) Removed the leading "F" that had been added to facility IDs 4) Various graph formatting changes (graph heights, titles, etc.)	Analyze Outputs
8	Added a completion pop-up to the Census Updater.	Revise Census Data
9	Added green icon indicator when Census Updater is being run.	