**Surface Water Models to Assess Exposures** <https://www.epa.gov/ceam/surface-water-models-assess-exposures>

The EPA Center for Exposure Assessment Modeling (CEAM) distributes simulation models and database software designed to quantify movement and concentration of contaminants in lakes, streams, estuaries, and marine environments.

**Available Products**

The following surface water models were developed by the U.S. Environmental Protection Agency in conjunction with other government, academic, and commercial institutions. To find out more about a particular model, click on a hyper-linked model name in the table below. The models listed are available for download and are subject to the CEAM [distribution and support policy](https://www.epa.gov/ceam/distribution-and-support-policy-exposure-assessment-models).

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| **Product Name** | **Operating System** | **Key Words** | **Maintained By** |
| [AQUATOX](https://www.epa.gov/ceam/aquatox) | Windows | aquatox, simulation model, fate prediction, aquatic systems, effect on ecosystem, ecological risk assessments, aquatic ecosystem | [CEAM](https://www.epa.gov/ceam) |
| [BASINS](https://www.epa.gov/ceam/better-assessment-science-integrating-point-and-non-point-sources-basins) | Win XP, Vista, 7, 8, 10 | multipurpose environmental analysis system, watershed management, water quality, tmdl, gis framework, analytical components, ndpes | [CEAM](https://www.epa.gov/ceam) |
| [DFLOW](https://www.epa.gov/ceam/dflow) | Win XP, Vista, 7, 8 | stream flows, low flow analysis, design flow statistics, daily stream flow records | [CEAM](https://www.epa.gov/ceam) |
| [EFDC](https://www.epa.gov/ceam/environmental-fluid-dynamics-code-efdc) | Win 98, NT, 2000, XP | surface water, hydrodynamic, sediment-contaminant, eutrophication, rivers, lakes, reservoirs, wetlands, estuaries, coastal ocean regions, assessment, management, regulatory | [CEAM](https://www.epa.gov/ceam) |
| [EXAMS](https://www.epa.gov/ceam/exams-version-index) | Win 98, NT, 2000, XP | aquatic biology, assessment, biology, chemistry, compliance, environmental effects, metals, NPS related, permits, pesticides, point source(s), rivers, streams, surface water, test/analysis | [CEAM](https://www.epa.gov/ceam) |
| [EXPRESS](https://www.epa.gov/ceam/express-exams-przm-exposure-simulation-shell) | Win 98, NT, 2000, XP | przm, exams, exposure, shell | [CEAM](https://www.epa.gov/ceam) |
| [GCSOLAR](https://www.epa.gov/ceam/gcsolar) | Windows 7,8,10 | solar, photolysis, half-life, pollutant, aquatic, ozone | [CEAM](https://www.epa.gov/ceam) |
| [HMS](https://www.epa.gov/ceam/hydrologic-micro-services-hms) | Web Services | hydro-informatics, hydrologic micro services, environmental modeling, water quality data provisioning web services, modeling components, precipitation, air temperature, solar radiation, soil moisture, evapotranspiration, surface and subsurface flow, runoff. | [CEAM](https://www.epa.gov/ceam) |
| [HSCTM2D](https://www.epa.gov/ceam/hsctm2d) | Win 9x, NT | hydrology, sediment, contaminant, transport, finite element model, river, estuary | [CEAM](https://www.epa.gov/ceam) |
| [HSPF](https://www.epa.gov/ceam/hydrological-simulation-program-fortran-hspf) | Windows XP, Vista, Windows 7, or Windows 8 | assessment, biology, compliance, deposition, discharge, environmental effects, estuaries, hydrology, lakes, metals, monitoring, NPS related, NPDES, nutrients, permits, pesticides, point source(s), rivers, sediment, streams, surface water, test/analysis, TMDL related, toxicity | [CEAM](https://www.epa.gov/ceam) |
| [Low Flow](https://www.epa.gov/ceam/definition-and-characteristics-low-flows) | Text only | definition and characteristics, low flows, aquatic life criteria, design flows | [CEAM](https://www.epa.gov/ceam) |
| [PRZM3](https://www.epa.gov/ceam/przm-version-index) | Win 98, NT, 2000, XP | assessment, discharge, environmental effects, hydrology, land use management, metals, pesticides, surface water, test/analysis | [CEAM](https://www.epa.gov/ceam) |
| [QUAL2K](http://www.qual2k.com/) | Win ME, 2000, XP | aquatic biology, assessment, compliance, discharge, environmental effects, hydrology, NPS related, NPDES, point source(s), surface water, test/analysis, TMDL related | [EPA Region 4](https://www.epa.gov/aboutepa/about-epa-region-4-southeast) |
| [RUSLE2](https://www.ars.usda.gov/southeast-area/oxford-ms/national-sedimentation-laboratory/watershed-physical-processes-research/research/rusle2/revised-universal-soil-loss-equation-2-overview-of-rusle2/) | Win 98, NT, 2000, XP | rill, interrill, erosion, sediment, overland flow, climate, soil, topography, land use | [USDA Agricultural Research Service](https://www.ars.usda.gov/) |
| [SERAFM](https://www.epa.gov/ceam/serafm-conceptual-model) | MS-Excel | serafm, exposure, assessment, mercury, hg, surface water, pond, stream, river | [CEAM](https://www.epa.gov/ceam) |
| [SWMM](https://www.epa.gov/water-research/storm-water-management-model-swmm) | Win 98, NT, ME, 2000, XP | aquatic biology, assessment, combined sewer, community, discharge, environmental effects, metals, NPS related, NPDES, point source(s), procedure, rivers, stormwater, streams, surface water, test/analysis, TMDL related | Center for Environmental Solutions and Emergency Response ([CESER](https://www.epa.gov/aboutepa/about-center-environmental-solutions-and-emergency-response-ceser)) |
| [Surface Water Toolbox](https://www.usgs.gov/software/swtoolbox-software-information) | Win 7, 8 | Water Resources, Groundwater and Streamflow Information Program, n-day frequency analysis, compute biologically-based design flows, Flow duration curves | [US Geological Service (USGS)](https://www.usgs.gov/mission-areas/water-resources) |
| [Virtual Beach](https://www.epa.gov/ceam/virtual-beach-vb) | MS Windows | surface water, water bodies, beach, pathogen predictor, multiple linear regression, MLR, best-fit model | [CEAM](https://www.epa.gov/ceam) |
| [Visual Plumes](https://www.epa.gov/ceam/visual-plumes) | Win 98, NT, 2000, XP | surface, water, jet, plume, model, quality, contaminant, TMDL | [CEAM](https://www.epa.gov/ceam) |
| [WASP](https://www.epa.gov/ceam/water-quality-analysis-simulation-program-wasp) | Early versions of Windows, 64-bit Windows 7 or higher, Mac OSX, Linux Ubuntu | aquatic biology, assessment, compliance, discharge, environmental effects, hydrology, metals, NPS related, NPDES, point source(s), surface water, test/analysis, TMDL related | [CEAM](https://www.epa.gov/ceam) |
| [WHATIF](https://www.epa.gov/ceam/whatif-watershed-health-assessment-tools-investigating-fisheries) | Win XP(SP2) | watershed, health, fish, habitat, macro-invertebrate, biodiversity, BASS, biomass, biota, aquatic ecosystem, MAHA, CVI, hydraulic, bankfull, flow, restoration, food web, mercury, PCB, dioxin | [CEAM](https://www.epa.gov/ceam) |
| [WMOST](https://www.epa.gov/ceam/wmost) | Windows Excel 2010, 2013, 2016 with Macros | Integrated Watershed Management, Optimization, Decision-Support, Green Infrastructure, Tool | [CEAM](https://www.epa.gov/ceam) |