



INTEGRATED ENVIRONMENTAL MODELLING FRAMEWORK FOR CUMULATIVE EFFECTS ASSESSMENT

Authors: Anil Gupta, Babak Farjad, George Wang,
Hyung Eum, and Monique Dubé

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Acronyms and Abbreviations

AD	Advection-dispersion
AET	Actual Evapotranspiration
AnnAGNPS	Annualized Agricultural Non-Point Source Pollution Model
AOGCM	Atmosphere–Ocean Global Climate Model
API	Application Programming Interface
ARO	US Army Research Office
BASINS	Better Assessment Science Integrating Point and Non-point Sources
BASS	Bioaccumulation and Aquatic System Simulator
BMPs	Best Management Practices
BSAF	Biota-Sediment Accumulation Factor
CA	Cellular Automata
CALPUFF	California Puff Model
CAMx	Comprehensive Air quality Model with extensions
CBOD	Carbonaceous Biological Oxygen Demand
CEA	Cumulative Effects Assessment
CEH	Center for Ecology and Hydrology
CEMA	Cumulative Environmental Management Association
CEQ	US Council on Environmental Quality

CESM	Community Earth System Model
CFSR	Climate Forecast System Reanalysis
CIT	California Institute of Technology-Carnegie Institute of Technology
CLUE	Conversion of Land Use and its Effects
CMAQ	Community Multiscale Air Quality Modeling System
CMB	Chemical Mass Balance
CMIP	Coupled Model Intercomparison Project
CO	Carbon Monoxide
COD	Chemical Oxygen Demand
CORDEX	Coordinated Regional Climate Downscaling Experiment
CSO	Combined Sewer Overflows
CUF	California Urban Futures Model
DEM	Digital Elevation Model
DO	Dissolved Oxygen
DOC	Dissolved Organic Carbon
DON	Dissolved Organic Nitrogen
DOP	Dissolved Organic Phosphrus
ECMWF	European Centre for Medium-Range Weather Forecasts
EFDC	Environmental Fluid Dynamics Code
ESP	Ecosystem Services Processor
ET	Evapotranspiration
FEFLOW	Finite Element subsurface FLOW system
FRAMES	Framework for Risk Analysis Multi-Media Environmental Systems

GCM	General Circulation Model
GIS	Geographic Information System
GLVHT	Generalized Longitudinal-Vertical Hydrodynamics and Transport Model
GUI	Graphical User Interface
HD	Hydrodynamic
HEC	United States Army Corps of Engineers Hydrologic Engineering Center
HEC-RAS	Hydrologic Engineering Center River Analysis System
HEC-HMS	Hydrological Modelling System
HGS	HydroGeoSphere
HRU	Hydrologic Response Unit
HSI	Habitat Suitability Index
HSPF	Hydrologic Simulation Program-Fortran
HSS	Hydrocarbon Spill-Source Package
IDW	Inverse distance weighted interpolation
IEM	Integrated environmental modelling
IMPLND	Impervious Land Module in HSPF
IPCC	Intergovernmental Panel on Climate Change
LAI	Leaf Area Index
LARM	Laterally Averaged Reservoir Model
LCCM	Land Cover Change Model
LID	Low Impact Development
LSPC	Loading Simulation Program in C++
LTM	Land Transformation Model
LUCK	Land Use Change Scenario Kit
LULC	Land Use/Land Cover

LUR	Land Use Regression
MBC	Multivariate Bias Correction
MHK	Marine and Hydro-kinetic
MLM	Mercury Loading Model
NARR	North American Regional Reanalysis
NCAR	National Center for Atmospheric Research
NCEP	National Centers for Environmental Prediction
NELP	NERC/ESRC Land Use Programme
NO ₂	Nitrogen dioxide
NRBS	Northern River Basins Study
O ₃	Ozone
OGS	OpenGeoSys
OpenMI	Open Modelling Interface
pH	Potential of Hydrogen
PERLND	Pervious Land Module in HSPF
PHABSIM	Physical Habitat Simulation System
PM	Particulate Matter
PMF	Positive Matrix Factorization
PRMS	Precipitation-Runoff Modelling System
QDM	Quantile Delta Mapping
RADM	Regional Acid Deposition Model
RCHRES	Free-flowing Reach or Mixed Reservoirs Module in HSPF
RCM	Regional Climate Model
RCPs	Representative Concentration Pathways
REMSAD	Regional Modelling System for Aerosols and Deposition
RPEM	Rooted Plant and Epiphyte Model

RUSLE	Revised Universal Soil Loss Equation
SNL-EFDC	Sandia National Laboratories modified Environmental Fluid Dynamics Code
SP	Streeter–Phelps
SRES	Special Report on Emissions Scenarios
SUTRA	Saturated-Unsaturated Transport
SWAT	Soil and Water Assessment Tool
SWMM	Storm Water Management Model
TKN	Total Kjeldahl Nitrogen
TMDL	Total Maximum Daily Load
TN	Total Nitrogen
TOC	Total Organic Carbon
TON	Total Organic Nitrogen
TOP	Total Organic Phosphorus
TP	Total Phosphorus
UGM	Urban Growth Model
UH	Unit Hydrograph
UrbanSim	Urban Development Simulation Model
VBA	Visual Basic for Applications
VOGG	Visual Orthogonal Grid Generator
WASP	Water Analysis Simulation Program
WES	United States Army Engineer Waterways Experiment Station
WLA	Waste Load Allocation

