WQMAP™

Water Quality Management and Analysis WQMAP™ is an integrated modeling system designed to study surface water quality issues. The system allows the engineer or scientist to develop numerical model grids, perform hydrodynamic simulations, conduct single constituent pollutant transport and multiple constituent eutrophication studies in a geographic context from one application.

**Typical WQMAP Applications**
- Total Maximum Daily Loads
- Industrial Produced Water Discharges
- Combined Sewer Overflows
- Cooling Water Intakes and Discharges
- Effects of Engineered Structures

**Features**
- Integrated Geographic Information System
- Boundary conforming, general curvilinear co-ordinate system
- Grid Generation
- Hydrodynamic Model
- Pollutant Transport Model
- Eutrophication Model
- All model use same computational grid
- Applicable within regions such as rivers, lakes, estuaries, bays and coastal seas

**Environmental Regulations**
**WQMAP can Address U.S. Clean Water Act**
- Section 303(d): Total Maximum Daily Loads
- Section 316(a&b): Cooling Water Intakes
- Section 316(b): Cooling Water Discharges
- National Pollutant Discharge Elimination System (NPDES) permit program

**E.U. Regulations**
- Bathing Water Quality Directive (76/160/EEC)
- Nitrates Directive (91/676/EEC)

**Grid Generation**
- Rapid rectangular grid generation
  - Select Domain of Interest
  - Specify dimensions
  - Automatic Land Water Mask
- Complex quadrilateral grids
  - Interactive specification of boundary points
  - Poisson solver for interior domain
  - Node editing tools
- Global Bathymetric Database
- User Defined Bathymetric Database

**Hydrodynamic Model**
- Fully coupled prognostic three-dimensional equations governing conservation of mass, momentum, density and temperature
  - General Curvilinear Co-ordinate Formulation
  - Forcing includes water elevation, wind speed and direction, fresh water input and solar radiation
  - Global tidal harmonics databases

**Pollutant Transport Model**
- Single constituent advection-diffusion equation
  - Curvilinear Orthogonal Formulation
  - First Order decay and settling
  - Multiple load sites
Eutrophication Model

- Incorporates USEPA WASP kinetic rate equations
- Species Include:
  - Ammonia (NH₃)
  - Nitrates (NO₃)
  - Phosphates (PO₄)
  - Biological Oxygen Demand (BOD)
  - Dissolved Oxygen (DO)
  - Organic Nitrogen
  - Organic Phosphorous
  - Phytoplankton

RPS is a global science and technology solutions company. Through consulting, environmental modeling, and application development, RPS helps a diverse range of clients in government, industry, and academia investigate their issues of concern and obtain functional answers.

RPS’s solutions are based on applied science and advanced research. Our services and products, along with our staff’s diverse technical backgrounds, are specialized in the analysis of marine, freshwater, air, and land resources; computer modeling of physical, chemical, and biological processes; geographic information systems (GIS); operational research; and data management.

RPS’s suite of environmental modeling tools are available for licensed use and customization and include: OILMAP™, SARMAP™, CHEMMAP™, SIMAP™, and AIRMAP™.

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