

**Division of Water Resources  
Guidelines for Water Quality Modeling Plans**

**August 20, 2013**

The purpose of this outline is to provide guidance on the types of information that should be provided in a water quality modeling plan document.

The purposes for developing a modeling plan document are:

1. To provide a “road map” for model development that can easily be shared with the project team and stakeholders.
2. To ensure that the appropriate model is selected to best meet stated goals.
3. To manage expectations regarding model capabilities.
4. To ensure that data needs are identified and any associated monitoring is scheduled and built in to the model development timeline.
5. To ensure that there is understanding and agreement prior to model development regarding calibration targets and model performance targets. This is most critical when there is the expectation of using the model for regulatory purposes.

A complete modeling plan document should include the following information:

**I. Project Goals**

This section should contain the following components:

- A problem statement, detailing the purpose of and the questions to be answered by the model. This involves defining the purpose and scope of the work.
- Identification of the objectives and goals of the project (relevant to management/regulatory decisions).
- Description of the key water quality parameters of concern (e.g., chlorophyll-a, total organic carbon).
- Features or capabilities that are desired in the model (e.g., the model should have the ability to explicitly represent best management practices or the model should have the ability to represent multiple algal groups).

## **II. Project Organization**

Describe the project team that will be working on the model (project administration/ management, modeling team, QA/QC team etc.).

## **III. Modeling Plan (note if the plan is to develop both a watershed model and response model, these should each have a separate section)**

This section should contain the following components:

- Model geographic scope – spatial boundaries for the model, where the model starts and where it ends. A map should also be included.
- Temporal scope – the time period that the model will cover. Ensure that hydrologic conditions appropriate for the project goals are covered by the proposed temporal scope (e.g., wet year, dry year, etc.).
- Model endpoints – the desired model endpoints (which should coincide with the parameters of concern discussed in the goals section).
- Model selection – describe existing modeling packages, specifically in the context of whether or not each model can represent desired features or capabilities outlined in the goals section and the associated limitations. End this discussion with the resulting selected model and describe why the model was selected.
- Model data needs – describe the data needs for the selected model.
- Data gaps – describe existing data and provide a monitoring plan to gather data that are not currently available. If a monitoring plan has been developed as a separate document, a reference to the monitoring plan should be included.
- Model calibration/corroboratorion - describe the independent data sets to be used for model calibration and corroboratorion, if applicable. Include a description (including maps) of the monitoring stations proposed for model calibration and corroboratorion.
- Model performance targets (flow and water quality) - state the model performance targets for both flow and water quality (calibration criteria). Performance targets can be statistical or graphical, depending on the availability of data.

## **IV. Data Management**

This section should describe the methods (e.g., MS Access database) that will be used for data management, including model post-processing.

**V. Model Review**

This section should describe any intended plan to obtain an independent third party or peer review of the draft model. This is generally appropriate only for the more complex models where independent review will provide additional confidence in the model's capability to address the stated goals.

**VI. Quality Assurance Plan**

Describe the procedures that will be used for quality assurance. Please refer to EPA's Guidance for Quality Assurance Project Plans for Modeling (<http://www.epa.gov/quality/qs-docs/g5m-final.pdf>).

**VII. Schedule**

Provide a draft schedule for monitoring and model development, including any internal, external, and independent review process.