Modeling Nitrogen in the Watershed:
A New Tool for Evaluating Management Alternatives
to Reduce Nutrient Loading to Elkhorn Slough

Workshop Agenda
May 27th, 2003

Developing a Decision Support System for Evaluating Best Management Practices

8:30 – 9:00   Registration and Coffee

9:00 – 9:10   Introductions and Workshop Objectives   Dr. Grey Hayes (ES-NERR)

9:10 – 9:35   Project Description   Dr. William Salas (Applied Geosolutions)
- ➢ Dr. Salas will provide an overview of the project funded by NOAA's Cooperative Institute for Coastal and Estuarine Environmental Technology. The objective of this project is to utilize an existing process-based biogeochemical model, called Denitrification-Decomposition or DNDC, to develop a geospatial tool for assessing the effectiveness of agricultural management options for reducing trace gas emissions and nutrient loading to the Elkhorn Slough NERR.

9:35 – 9:55   Participant Introductions   All
- ➢ Opportunity for participants to introduce themselves and their interests in nutrient and nitrogen management in the region.

9:55 – 10:55   DNDC Model Overview   Dr. Changsheng Li (UNH)
- ➢ A process-oriented computer simulation model, Denitrification-Decomposition or DNDC, was developed based on the biogeochemical concepts for predicting soil carbon and nitrogen biogeochemistry. Dr. Li will provide a more detailed description of the DNDC model (drivers, input variables, outputs, etc.) and brief overview of validation studies and results from some sample applications.

10:50 – 11:15   Coffee Break

11:15 – 12:15 Nitrate Leaching with DNDC   Dr. Neda Farahbakhshazad (MIT)
- ➢ DNDC ability to predict nitrate leaching from agro-ecosystems has been tested using water leaching fluxes and nitrate concentration data from a study in Iowa. Modeled water leaching rates compared favorably with field measured flux rates from 1996 through 1999. Modeled and field estimates of annual nitrogen leaching rates exhibited similar patterns and magnitudes. Dr. Farahbakhshazad will present results from a recent study in Iowa using DNDC for simulating nitrate leaching from a corn-soybean rotation.

12:15 – 1:30   Lunch Break: Workshop will provide lunch

1:30 – 3:30   Decision Support System Interface   Steve Boles and Mike Routhier (UNH)

➢ The project is creating a custom ArcView interface for DNDC that will facilitate the easy ingestion and export of data to/from DNDC through ArcView and enhance data visualization. The common ArcView desktop interface will be modified to include DNDC-specific tools, including: export of ArcView-format GIS files into DNDC-ingestible data tables; running of the DNDC model; import of DNDC output data tables to ArcView-format GIS files. This section will provide an introduction of the prototype interface and a demonstration of how it will operate.

3:30 – 3:50   Coffee Break

3:50 – 4:30   Discussion of Management Scenarios   All with Drs. Li and Salas leading discussion.

➢ The goal of this workshop is to provide an overview of DNDC and our project to potential users and managers and to build an understanding of the management issues facing farmers and managers in the Elkhorn Slough watershed. This period will be spent discussing sources of management data and management scenarios under consideration in the region. Drs. Li and Salas will facilitate this discussion by initially presenting "default" management data.

4:30 – 5:00   Closing Question & Answer Period   All
➢ Closing question and answer period. Opportunity for participant feedback, including discussions on ways to enhance the utility of decision support system and changes/improvements to the prototype interface. Opportunity to discuss plans for model demonstration on May 28th.

May 28th
Location: Moss Landing Marine Labs

9:00 – 12:00   Hands on use of model & Follow up Discussions on Management
➢ Interested participants can run the prototype model and have an opportunity for more detailed discussions of management scenarios. Based on the candidate management alternatives, the project will then modify the decision support tool to simulate the range of alternatives in preparation for the second workshop to be held in May 2004. At the second workshop, participants will be presented with the updated tool and will receive detailed training.