



California Water and Environmental Modeling Forum

Promoting Excellence and Consensus in Water and Environmental Modeling

P.O. Box 488, Sacramento, CA 95812 ♦ 916-607-0435 ♦ cwemf@cwemf.org ♦ www.cwemf.org

Technical Workshop[†] on Overview of Delta Nutrient Water Quality Problems: Nutrient Load – Water Quality Impact Modeling

Tuesday, March 25, 2008

8:30 a.m. to 4:30 p.m.

Secretary of State Building Auditorium, 1500 11th Street, Sacramento, CA.
(Corner of 11th and “O” Streets, First Floor. Please show your ID.)

No-charge for CWEMF members*; \$50 for non-members; \$10 for student non-members**

Fee payable at the door or by mailing cash or check.

Space is limited. To register, please email your name and affiliation to technicalworkshop@cwemf.org.

Objective

The objective of this workshop is to present an overview of the Delta's water quality impairment issues that are associated with aquatic plant nutrients (N and P). The focus will be the current state of information available, and still needed, to model and manage excessive fertilization in the Delta. If there is interest, this overview workshop will be followed at a later date by limited-scope workshops devoted to specific topics such as domestic water supply water-quality concerns, agricultural nutrient sources and their control, and modeling nutrient load–chlorophyll response in the Delta.

Agenda

8:30 a.m. **Welcome and Introduction**

Rich Satkowski (California Water and Environmental Modeling Forum)
Dr. G. Fred Lee (G. Fred Lee & Associates)

The Problems and Relationships to Nutrient Concentrations/Loads

8:45 a.m. **Overview of Delta Transport: How Inflows, Diversions, and Exports Affect Flow Patterns and Transport Processes**

Tara Smith (Department of Water Resources)

9:15 a.m. **Delta Nutrient Drinking Water Quality Issues**

Delta and Aqueduct Tastes & Odors and Bluegreen Algal (Cyanobacterial) Toxins

Dr. Jeff Janik (California Department of Water Resources)

Taste & Odor Problems in Southern Water Supplies

Dr. Richard Losee (Metropolitan Water District of Southern California)

Dr. Bill Taylor (Metropolitan Water District of Southern California)

Delta & Aqueduct Taste & Odor Precursors: Modeling Status

Dr. Paul Hutton (Metropolitan Water District of Southern California)

[†] Workshop organized by Drs. G. Fred Lee and Anne Jones-Lee of G. Fred Lee & Associates, El Macero, California (gfredlee.@aol.com, www.gfredlee.com)

* The following have current CWEMF organizational memberships: CH2M Hill, CCWD, EBMUD, MWDSC, CDWR, SWRCB, USBR, USCOE, USFWS and USGS.

** The workshop fee also provides CWEMF membership until the Annual Meeting in February 2009.

10:30 a.m. **Break**

10:45 a.m. **Nutrient Sources for Growth of Exotic Aquatic Plants in the Sacramento-San Joaquin Delta**

Dr. Lars W.J. Anderson (USDA-Agricultural Research Service)

Marcia Carlock (California Department of Boating and Waterways)

12:00 p.m. **Lunch**

1:00 p.m. **Low DO Problems in the SJR Deep Water Ship Channel**

Mark Gowdy (State Water Resources Control Board)

Modeling Agricultural Nutrient Loads, Algal Biomass, and Low DO in the SJR Deep Water Ship Channel

Dr. Carl Chen and Joel Herr (System Engineering, Inc.)

Nutrient Sources, Concentrations/Loads

2:00 p.m. **Impact of Sacramento River Input of Phosphorus to the Delta on Algal Growth in the Delta**

Dr. Erwin Van Nieuwenhuyse (Bureau Reclamation) *Summary of his recent paper describing the response of average summer chlorophyll concentration in the Delta to an abrupt and sustained reduction in phosphorus discharge from the Sacramento County Regional Sanitation District wastewater treatment facility.*

2:45 p.m. **Break**

3:00 p.m. **Conceptual Model of Nutrient Sources in the Central Valley and Delta**

Dr. Sujoy B. Roy (Tetra Tech, Inc.)

Regulatory Issues

3:30 p.m. **Development of Nutrient Criteria**

Steve Camacho (State Water Resources Control Board)

CVRWQCB Drinking Water Policy

Karen Larsen (Central Valley Regional Water Quality Control Board)

CVRWQCB Irrigated Lands Agricultural Conditional Waiver Water Quality Nutrient Monitoring Program

Margie Read (Central Valley Regional Water Quality Control Board)

4:25 p.m. **Final Comments**

4:30 p.m. **Adjourn** (Please turn in your evaluations)

List of Workshop Speakers

Dr. Lars W. J. Anderson, Lead Scientist/Plant Physiologist, USDA Agricultural Research Service Exotic and Invasive Weed Research, Davis, CA (lwanderson@ucdavis.edu)

Steve Camacho, Environmental Scientist, Planning, Standards, and Implementation Unit, State Water Resources Control Board, Sacramento, CA (scamacho@waterboards.ca.gov)

Marcia Carlock, Aquatic Weed Control Program Manager, California Department of Boating and Waterways, Sacramento, CA (MCARLOCK@dbw.ca.gov)

Dr. Carl W. Chen, President, Systech Engineering, Inc., San Ramon, CA (carl@systechengineering.com)

Mark Gowdy, Water Resources Engineer, Division of Water Rights, State Water Resources Control Board, Sacramento, CA (mgowdy@waterboards.ca.gov)

Joel W. Herr, Vice President and Chief Engineer, Systech Engineering, Inc., San Ramon, CA (joel@systechengineering.com)

Dr. Paul Hutton, Senior Engineer, Water Resources Management Group, Metropolitan Water District of Southern California, Sacramento, CA (phutton@mwdh2o.com)

Dr. Jeff Janik, Limnologist, California Department of Water Resources, Sacramento, CA (jjanik@water.ca.gov)

Karen Larsen, Senior Environmental Scientist, Central Valley Regional Water Quality Control Board, Rancho Cordova, CA (klarsen@waterboards.ca.gov)

Dr. G. Fred Lee, President, G. Fred Lee & Associates, El Macero, CA (gfredlee@aol.com)

Dr. Richard Losee, Water Quality Laboratory, Metropolitan Water District of Southern California, LaVerne, CA (rlosee@mwdh2o.com)

Margie Read, REAll, Chief, Monitoring and Assessment Unit, Irrigated Lands Conditional Waiver Program, Central Valley Regional Water Quality Control Board, Rancho Cordova, CA (mread@waterboards.ca.gov)

Dr. Sujoy B. Roy, Principal Engineer, Tetra Tech, Inc., Lafayette, CA (Sujoy.Roy@tetratech.com)

Rich Satkowski, Executive Director, California Water and Environmental Modeling Forum Sacramento, CA (cwemf@cwemf.org)

Tara Smith, Chief, Delta Modeling, Bay-Delta Office, CA Department of Water Resources Sacramento, CA (tara@water.ca.gov)

Dr. Bill Taylor, Limnologist, Reservoir Team Manager, Water Quality Section, Water Systems Operations, Metropolitan Water District of Southern California, LaVerne, CA (wtaylor@mwdh2o.com)

Dr. Erwin van Nieuwenhuysse, Fisheries Biologist, Division of Environmental Affairs, US Bureau Reclamation, Sacramento, CA (evannieuwenhuysse@mp.usbr.gov)

Development of the Workshop

On behalf of the California Water and Environmental Modeling Forum ([CWEMF](#)), Dr. Anne Jones-Lee and I are organizing a one-day workshop devoted to Delta Nutrient Water Quality Modeling issues.

Excessive aquatic plant nutrients (nitrogen and phosphorus compounds) are causing and/or contributing to several major water quality impairment issues in the Sacramento/San Joaquin Delta (Delta). Of particular concern are:

- excessive growths of algae that cause severe taste and odor problems for domestic water utilities that use Delta water as a raw water source, which require additional expenditure for water treatment;
- excessive growths of hyacinth and egeria that impair recreational use of the Delta, degrade the aquatic food web of the Delta, and cause the CA Department of Boating and Waterways to spend more than \$6 million per year for treatment of Delta waters with herbicides for hyacinth control;
- algal populations die and decompose, leading to low dissolved oxygen conditions that inhibit the homing migration of Chinook salmon in the San Joaquin River watershed, and at times cause fish kills. More than \$30 million will have to be spent to begin to control the low-DO problem in the San Joaquin River Deep Water Ship Channel near the Port of Stockton; and
- the balance of nutrient control for minimizing water quality problems with maintenance of adequate nutrients to sustain the aquatic food web and a healthy ecosystem in the Delta.

A key component of a nutrient management program is the development of models that will enable management agencies and the public to reliably predict and assess the changes in nutrient-related water quality characteristics in the Delta and in downstream domestic water supplies that would be expected to occur as a result of various nutrient control strategies and flow management options.

This workshop will provide an introduction to Delta Nutrient Water Quality problems and the Modeling of nutrient load/concentrations - water quality problems in the Delta.

Additional information on the need for this workshop and its organization is available in at:

Lee, G. F., and Jones-Lee, A., "Delta Nutrient Water Quality Modeling Workshop — Background Information," Report of G. Fred Lee & Associates, El Macero, CA, September (2007).
<http://www.members.aol.com/GFLEnviroQual/NutrWorkshopRev4.pdf>

Also Newsletter NL 11-2 at <http://www.members.aol.com/LFandWQ/swnews1102.pdf> provides additional background information on Delta nutrient water quality issues that are pertinent to the March 25 Workshop and followup workshops.

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