National Program 201: Water Quality & Management

Assessment Panel Meeting
May 24-25, 2005

Panel Chair:
Glenn J. Hoffman

Assessment Panel

- Nine persons participated
  - EPA
  - Irrigation Farmer
  - Irrigation Industry
  - NRCS
  - University Scientists & Extension Faculty

Panel Assessment Process

- Reviewed each component,
  - Background
  - Accomplishments/impact
  - Publication record
  - Consensus score for impact/quality
  - Written comments on each outcome

Panel Assessment Process

Wrote general comments on NP 201

- Interaction with end-users
- Strengths and weaknesses of the program
- Balance of effort among components

Observed and commented on

- Future needs
- Current problems to emphasize
- Current problems to de-emphasize

Panel Assessment Report Observations:

- Write-ups did not judge if goals were achieved.
- Many accomplishment statements did not clearly convey what was accomplished.
- Need “baseline” to judge improvements accomplished.

Panel Comments

- ARS remains the leader in research on water resources pertaining to agriculture.
- Techniques, tools, and models developed with it's colleagues have become standards.
- ARS scientists are called upon frequently because of their water quality and management expertise.

More attention needed:

- Total System Analysis
  - Components needing emphasis:
    - economic analysis
    - social consideration
    - energy use/conservation
    - water conservation
- Development of practices/systems for nutrient criteria to protect surface waters.
- Maintain readily-available, user-friendly clearinghouse of both long-term watershed data and simulation models.
- Long-term data sets collected with standardized methods are lacking.

Agricultural Watershed Management

Strengths:

- Development and use of remote sensing to determine spatial and temporal variations in watershed characteristics and hydrologic processes.
- Significant progress made in refining characterization and prediction tools for extreme climatic events.
- Research progress on the effectiveness of management practices on the amount of sediment and runoff that will reach surface waters.
- Tools developed that should help in setting TMDL limits, anticipating sustainable management concerns, and simulating effectiveness of conservation strategies.

Agricultural Watershed Management

Weaknesses:

- Assessment materials focused on hydrologic processes rather than watershed characterizations.
- Little information presented on wetlands and aquatic ecosystems.
- Limited progress on improved tools to assess and address ephemeral gully erosion.
- Simulation models have been refined and validated, but field demonstration is lacking.

Irrigation & Drainage Management

Strengths:

- Sensing equipment developed to adjust input resources for precision applications.
- Controlled drainage systems shown to be effective in managing shallow subsurface waters.
- Agricultural Drainage Management Systems Task Force formed.

Irrigation & Drainage Management

Weaknesses:

- To improve efficiency and economic viability, shift research focus to precision water management and away from aquifer-generated flood irrigation.
- Need agronomic information and software to translate data from sensors to user-friendly, real-time recommendations at the field level.
- Feasibility of controlled drainage where salinity is a hazard is uncertain because of leaching requirements.
- Research needed to quantify relationship between degree-day and crop coefficient, then link to reference ET

Water Quality Protection & Management

Strengths:

- Strong research efforts on N and P losses from agricultural lands.
- Riparian buffer work has reconfirmed their use to reduce transport of sediment and associated pollutants.
- Revised Universal Soil Loss Equation 2 was updated and is widely used by action agencies.
- PAM was shown to increase infiltration while sediment, phosphorus, and pathogens in irrigation tailwater were reduced.

Water Quality Protection & Management

Weaknesses:

- Additional investigation needed on biological indicators to assess water quality and amelioration.
- Need for information resulting in more efficient improvement of water quality in terms of better targeting and site-specific design.
- Economic and environmental effects in agriculture that will come with predicted climate changes should be a priority.

All Three Components

Strengths:

- SWAT, RZWQM, and CONCEPTS are supporting TMDL and pesticide regulations.
- Action agencies around the world use Soil Water Salinity, RUSLE2, and Soil and Water Assessment Tools for modeling at field and watershed scales.
- Major impacts on water use and water quality for numerous action agencies.
- Numerous examples of models being utilized by action agencies and other countries.

All Three Components

Weaknesses:

- Need more research on assessing the site-specific, field-to-stream processes that impact transport of sediment and associated pollutants.
- Basic research on fate and transport of pathogens is lacking.