

Suwannee Basin Science Workshop 2004

Thursday, September 23, 2004

Water Quality and Ecosystem
Dynamics Breakout Sessions

Summary Presented September 24

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Note of Appreciation to Facilitators

- **Thank you for your willingness to lead group discussions! The following priority summaries are a testament to your efforts!**
 - Carl Goodwin
 - Dale Griffin
 - Jack Kindinger
 - Lynn Lefebvre
 - Ben McPherson
 - Doug Nemeth
 - Ed Oaksford
 - Barbara Poore

Water Quality: Tools

- Standards and improved techniques
 - real time & continuous sampling network
 - consistent design and application
 - include SW, GW and water chemistry
 - interdisciplinary plan
 - landscape scale and process studies
 - applied to Florida, Georgia, and estuary
 - to understand water quality dynamics

Water Quality: Science Issues

- Microbial and nutrient source tracking
 - related geo-chemical processes in GW
 - develop genetic typing of host-specificity
 - ‘fingerprint’ link to GW/SW interactions
- Age-dating GW, vertical profiling
 - flow and residence time
- Water quality in estuary:
 - Eutrophication
 - low flow associated with climate change or water diversion

Water Quality: Public Health Issues

- **GW and SW contamination**
- Environmental effects and human health issues associated with:
 - agriculture to urban transition
 - degradates and other contaminants
 - septic tanks: N03 and pathogens
 - phosphorous, algal toxins, soil microbes
 - Fishing and shellfish - consumption
 - Agriculture, mining, other economic issues

Water Quality: IM and Integration

- Clearing house for data resources
 - IM = Information Management
- Integrate WQ, Water supply & BIOTA
 - impact of GW pollutants on ecosystem
 - model GW signature and movement
 - model to identify high vulnerability areas
 - salt/fresh interface and estuary production
 - Agric. practices and sediment loads (GA)
 - need Georgia data & collaboration
 - long time period and broad spatial scale

Water Quality: BMP's

- BMP – (Best Management Plan)
 - septic to sewer follow-up
 - riparian habitat for agricultural waste control
 - large scale implementation (FL & GA)
 - verify effectiveness in science and in management
 - develop new ideas
 - promote and apply regionally

Water Quality: Management Issues

- **Management Priorities:**
 - Management applications of science findings
 - Collaboration and integration of effort
 - Focus on Georgia/Florida integration
 - Spring-shed protection plan: time table
 - GW protection: technology, education & enforcement
 - plan for GW and aquifer pollutants
 - Intervention plans
 - PR work: information, outreach, lobbying
 - Funding

Ecosystem Dynamics Issues

Ecosystem Dynamics is a large topic - high priorities (>1 group) are highlighted in *yellow*

- ***Process-oriented research***
 - *How do the parts work together?*
- ***Adequate Biotic/Abiotic baseline data***
 - *Index of biological integrity or key species*
 - Life history of key species or community dynamics
 - Link species requirements to model for MFL (or reset MFL)

Ecosystem Dynamics: Habitat

- ***Define species interaction with habitat***
- ***Benthic habitat and monitoring in estuary***
 - Estuarine health & productivity
 - Changes to salinity, flow, and WQ dynamics
- ***Multi-resolution habitat mapping***
- ***Habitat monitoring and change in basin***
- ***List critical habitats & relative importance***
 - Identify unique and sensitive areas for protection
 - Identify ‘umbrella’ habitat for protection

Ecosystem Dynamics Model

- **Watershed Model Linking:**
 - **MFL (minimum flows and levels) to ecology**
 - **Biota and hydrogeology: water flow is basic control in basin**
 - Impact of river stage and WQ change on habitat, especially in middle and upper basin
 - Impact of water withdrawal on flora/fauna
 - **Extreme events, extreme change and ecology:**
 - Climate change, drought, temperature, sea level
 - **Develop trends with existing data**
 - **Nutrients, plants, and animals (trophic levels)**

Ecosystem Dynamics Next Step

- ***Full watershed study (FL & GA)***
- ***Digitally accessible inventory/database***
- ***Impact of land use/change thru time***
- ***Discourse on “significant harm”***
 - Scientific meaning
 - Societal acceptance
- **Review exist models and applicability**

Ecosystem Dynamics: Management

- ***Coordinate and integrate efforts***
 - *Planning, execution and sharing of data*
 - *Best use of existing data and resources*
- **Hydrologic Observatory (support for HO)**
- **Ecosystem restoration plan**
- **Commitment to progress: Funding**

Proposed USGS Role

- **Science data management**
 - National database
 - Publications
- **Expertise**
 - Process studies, WQ analysis, habitat and species, remote sensing, modeling,
 - technical and science resource
- **Coordinator and participant:**
 - Resource management and interagency cooperation

Final Priority Discussion

- **Short-term objective**
 - Effective use of existing resources
 - Practical and valuable product
- **Long-term vision**
 - **BIG PICTURE**
 - **Integrated (scientific and interagency)**
 - **Envision Suwannee effort as model for other river basins**