

SESSION I

TIME: Tuesday 13 April, 8:30-10:00

ROOM: Maryland - F

TRACK: Watershed / System Assessment

TOPIC: Special Area Management Plans (SAMPS)

MODERATOR: Robert Brumbaugh, IWR

PRESENTATIONS:

Title: System Perspectives on 404 Permit Applications in Florida

Presenters: John R. Hall, Jacksonville District; Robert B. Barron, Jacksonville District; Timothy D. Feather, CDM Federal Programs Corporation

Abstract: In Florida, the State population grows by about 850 persons a day. The State's natural resources are one of the major reasons for that growth. They range from temperate forests with seasonal changes to tropical environments. Despite some progressive State land use planning programs, the sheer magnitude of population growth, which requires about 350 acres of land conversion daily, is placing natural systems under increasing stress. The U. S. Army Corps of Engineers Section 404 regulatory program is deeply involved regulating wetlands, the filling of which are inexorably bound to the State's growth. In seeking to improve the effectiveness and efficiency of permit decisions tied to Section 404, District Regulators have instituted watershed scale analyses of the key environmental drivers to provide a system-wide perspective on permit impacts. These initiatives draw readily from tools and procedures used by Corps planners, such as establishing objectives, creating/evaluating alternatives, stakeholder involvement, economic impact evaluation, and environmental assessment. This presentation describes these regulatory initiatives, highlighting the analytical framework and selected results in addressing the regulatory requirements in the Lake Belt and Southwest Florida regions.

Title: SAMP for the San Diego Creek Watershed

Presenter: Dan Smith, ERDC

Abstract: The Corps of Engineers, Los Angeles District is developing a Special Area Management Plan (SAMP) for the San Diego Creek watershed, Orange County, California. The goal of the SAMP is to achieve a balance between economic development and aquatic resource protection. An important component of the SAMP is the assessment of riparian ecosystem integrity throughout the watershed to establish baseline conditions, provide an estimate of past cumulative impacts, and determine potential impacts of future development activities. Riparian ecosystems in the watershed were delineated, then divided into riparian reach assessment units defined as a relatively homogeneous segment of main stem stream channel and adjacent riparian ecosystem. Each riparian reach was then assessed using a suite of seventeen indicators related to the physical, chemical and biological condition of the riparian ecosystem at three spatial scales: the riparian reach proper, terrestrial areas adjacent and draining directly to the riparian reach, and the drainage basin of the riparian reach. Indicator metrics were collected in the field and using remotely sensed information. Metrics were scaled to a culturally unaltered "reference standard condition" then summed to provide an index of hydrologic, water quality, and habitat integrity for each riparian reach based the deflection from a reference standard. Results from the baseline assessment have subsequently been used to conduct an analysis of alternatives through a simulation of future expected conditions, prepare general and programmatic Section 404 permits, and develop a restoration plan for riparian ecosystems in the watershed.

SESSION III

TIME: Tuesday 13 April, 3:30-5:00

ROOM: Maryland - F

TRACK: Watershed / System Assessment

TOPIC: Watershed Tools & Techniques

MODERATOR: Mark Harberg, Southwestern Division

PRESENTATIONS:

Title: Watershed Analysis with HEC-WAT (Watershed Analysis Tool)

Presenter: Christopher N. Dunn, P.E. IWR-HEC

Abstract: The U.S. Army Corps of Engineers conducts watershed and water resources management studies. These studies begin with the definition of problems, issues, and opportunities and continue with various analyses to determine impacts so that appropriate decisions may be made. The studies often require hydrologic/hydraulic, economic, environmental, and social impact analyses. In most cases, sections within a district office perform these impact analyses independently with the reporting and visualization of modeling results through independent models. For the project study, coordination, file/data sharing, logistics, reporting of modeling results, and status reporting are often a problem for modeling teams and project management. The Corps needs to streamline and integrate the tools commonly applied by the district and division offices to perform these analyses so that more efficient and coordinated planning may be performed.

The Hydrologic Engineering Center is developing a tool, Watershed Analysis Tool (HEC-WAT), to address the needs cited above. The WAT would help districts perform comprehensive watershed scale studies by creating procedures and capabilities that allow integrated modeling using risk analysis. The tool would improve coordination and communication across Project Delivery Teams, allow the PDT to share data across models, involve modelers early in the study process, and encourage a team approach. The modeling teams would benefit because they will be able to develop their models in a closely coordinated manner, track progress of other models, and automatically retrieve results from previous model runs thus assuring efficient and coordinated results. A control and visualization interface will allow data and results sharing, common schematic assembly, alternative definition and representation, model setup, editing and implementation, and direct data and results visualization. Management would benefit by being able to track project status through each modeling component and being able to display results during public and project status meetings.

Title: Testing the Ability of the Willamette Basin Reservoir System to Meet Proposed Fish Flows

Presenter: Portland District; John Hickey, P.E., IWR-HEC

Abstract: In July 2000, the National Marine Fisheries Service (NMFS) drafted a biological opinion for the Upper Willamette Basin, which is home to several threatened species (spring Chinook, winter Steelhead, and others). Included in the biological opinion was a recommendation that the U.S. Army Corps of Engineers (USACE) develop flow release strategies designed to benefit natural fish populations.

In cooperation and coordination with NMFS, Bonneville Power Administration (BPA), U.S. Bureau of Reclamation (USBR), U.S. Fish and Wildlife Service (USFWS), and the State of Oregon, USACE scripted target flow criteria for abundant, moderate, and low storage water years at locations on the Willamette mainstem.

The Portland District contacted the Hydrologic Engineering Center (HEC) for technical assistance with a reservoir analysis designed to answer one fundamental question: Based on historical hydrology, could the Willamette Basin Reservoir System have released enough water to meet the new fisheries requirements (which called for flows and volumes as much as triple the original requirements)?

An HEC-5 model, originally developed by the Portland District, was modified and calibrated for use in this study. For such a fundamental question, the application was actually quite complex with 10 storage reservoirs operating to meet high and low flow criteria at multiple downstream points over a 64-year period of record. This paper provides study background, presents technical results, and discusses how technical information was used in an interagency setting.

Title: Environmental Considerations in The Ohio River Mainstem System Study
Presenters: Tom Swor, Nashville District; Larry Canter, Ph. D., University of Oklahoma

Abstract

Environmental impact studies for water resources plans are entering a “new era” due to the need to address cumulative effects, resource and ecosystem sustainability, numerous policy and impact-related uncertainties, and the integration of economic evaluations. This paper illustrates such “new era” studies related to the on-going development of a system investment plan (SIP) to 2060 for navigation on the Ohio River. Further, the concepts of adaptive environmental management involving monitoring and feedback to continuing decision-making are described. In addition, an analysis of environmental sustainability (AES) based on the cumulative effects from past, present, and future actions along the mainstem of the Ohio River is illustrated for water quality. The key observations from this work-in-progress are: (1) the 11-step methodology of the Council on Environmental Quality provides a useful framework for conducting a comprehensive study of cumulative effects at a programmatic (plan) level; (2) the environmental sustainability (ES) of resources and ecosystems can be assessed based upon the composite consideration of the past, current, and future conditions of selected and tiered indicators; (3) adaptive management, which is derived from scientifically-based monitoring, can be a useful tool for reducing uncertainties related to actions, environmental systems, and responses to stress; (4) the outputs from the SIP can be used as inputs in the development of an adaptive management program; and (5) tiering from the current programmatic environmental impact statement (PEIS) under preparation will be required in response to future updates in the SIP and decisions related to adaptive management.

Title: Prescriptive Reservoir Modeling and the ROPE Study (St. Paul District)
Presenters: Jason T. Needham, P.E., IWR-HEC; Kevin Bluhm, St. Paul District

Abstract: The Hydrologic Engineering Center (HEC) is assisting the St. Paul District in a large-scale study of the Upper Mississippi Reservoir System, termed ROPE (Reservoir Operation Plan Evaluation). The study will develop a new operation policy for each of the reservoirs and the reservoir system that considers and attempts to balance the many functions and objectives of the system as a whole. These objectives include navigation, tribal resources, flood damage reduction, fish and wildlife habitat considerations, recreation, water quality, water supply, erosion and sedimentation control, hydropower production, and sustaining hydrologic function on lakes and rivers.

The shared vision effort for the Upper Mississippi River System requires a modeling approach that captures the tradeoffs between the various water system objectives that drive system operation, and is transparent and understandable to the individuals who embody those objectives. An approach that uses both optimization, which makes decisions based on their value to objectives, and simulation, which makes decisions that follow operating instructions or rules, is an excellent way to evaluate those tradeoffs and assess the many conflicting needs and responsibilities of the water system. Using an optimization and a simulation model alternately, each informing and updating the other, can help participants better understand the system and the interaction between objectives, and allow them to develop a plan of operation that balances those objectives as effectively as possible.

SESSION V

TIME: Wednesday 14 April, 3:30-5:00

ROOM: Maryland - F

TRACK: Watershed / System Assessment

TOPIC: Partnerships

MODERATOR: Beverly Getzen, HQUSACE

PRESENTATIONS:

Title: Collaborative Economics: Lower Snake Juvenile Salmon Migration Study
Presenters: Jim Fredericks, Northwestern Division; Ed Woodruff, Northwestern Division

Abstract: The session will use the Lower Snake Juvenile Salmon Migration Feasibility Report and Environmental Impact Statement as a case study. The session will focus on how we can effectively involve other agencies and groups in the NED evaluation of projects. In addition, the session will explore the successful use of economists outside the Corps in the technical review of studies. The Lower Snake Juvenile Salmon Migration Feasibility Report and Environmental Impact Statement was a comprehensive 7-year study that, among other things, evaluated economic effects to large multi-purpose projects on the Snake River. This was a very controversial study since it considered the possible removal of the four existing Corps of Engineers' Lower Snake River Dams. The effort expended by the study team resulted in their receiving the 2002 Outstanding Planning Achievement Award. This study set a new standard for involving stakeholders and outside experts in the analysis of economic effects. Economic work groups for each affected project purpose (inland navigation, hydropower, recreation, irrigation and M&I water, and commercial fishing to name a few) were formed with tribal, state, agency, and stakeholder participation. A group of academic and industry experts were formed into the Independent Economic Advisory Board (IEAB). The IEAB conducted technical review and provide oversight in the economic evaluation of alternatives.

The presentation will discuss the use of outside experts for review and oversight including: The selection of independent panel members; Ensuring a balanced panel; Appropriate tasks for the panel; Costs of the panel; Problems & Opportunities - Disagreements among panel and review team members, Re-work (water compelled rates), Tangents (cost allocation)

The presentation will also discuss the use of stakeholders and interest groups in the evaluation of alternatives: Appropriate involvement of outside groups in evaluation; Benefits of outside groups; Communication; Issues - strong stakeholder views, Overwhelming and underwhelming personalities, Corps as the decision maker.

Title: Sustainable Rivers Project: A Collaboration Between The Nature Conservancy and USACE
Presenter: John Hickey, P.E. IWR-HEC

Abstract: The Sustainable Rivers Project (SRP) partners the U.S. Army Corps of Engineers (Corps) and The Nature Conservancy (TNC) in an ongoing effort to identify opportunities and implement plans to reoperate Corps dams to achieve more ecologically sustainable flows, while meeting human needs. Initiated by a memorandum of understanding between the Corps and TNC in 2000, SRP began with a collaboration to improve habitat along the Green River in Kentucky by changing the water release

schedule from Green River Dam. Since then, SRP has identified nine other rivers with thirteen dams as candidate sites for reoperation and hopes to expand this list in the future. In January 2004, the Hydrologic Engineering Center (HEC) and TNC began an Interagency Personnel Agreement that provides the services of John Hickey, a hydraulic engineer at HEC, to the Sustainable Rivers Project. Through this agreement, HEC will work with involved Corps Districts and TNC to provide technical expertise and methods while becoming more familiar with the needs of the Sustainable Rivers Project and other restoration and reservoir reoperation efforts that seek to alter the flow regime to improve ecosystem health while continuing to provide services such as flood damage reduction, hydropower, and water supply. This experience will allow HEC to further understand challenges faced by the Sustainable Rivers Project and thus develop improved techniques, capabilities, guidance, and software features to better empower Corps personnel to meet our water resources management responsibilities. This presentation provides background on the Sustainable Rivers Project, the personnel agreement, and discusses experiences from the Savannah River Basin, which was the first project site visited through the personnel agreement.

Title: Building Partnerships for Watershed-Friendly Development
Presenter: Christine Olsenius, SE Regional Watershed Forum

Abstract: The ability to manage the impact of development on water quality and supply will determine the future of the Southeast. The SE has lost more open space, farmland and forests to sprawl and development than any other region of the country in the last ten years. Five of the ten “most sprawling metropolitan areas of 1 million population or more” are in the Southeast. NASA has already estimated that the growing “heat Island” around Atlanta is changing rainfall patterns. From 1974 – 1996, the area of heavy tree cover in Chattanooga, Tennessee declined by 50%, resulting in a 17% increase in stormwater runoff at a cost of \$279 million. Research has shown that communities with greater than 10-15 percent impervious surfaces show a decline in water quality. In addition, courts and legislative bodies have expanded the basic rules of liability to make governments responsible for actions which result in damage to others, including downstream communities adversely impacted from upstream land use activities.

To address these issues a unique partnership is forming in the Cumberland River Basin (KY-TN) which includes the Army Corps of Engineers and other federal, state and local agencies and community organizations. The partnership has established three “watershed-friendly” pilot projects; two residential and one commercial, which maintain green infrastructure and minimize erosion and runoff. Water monitoring sites for before and after construction have been established. These pilot efforts will provide a template for development throughout the Southeast.

Title: Partnerships as a Program Delivery Network
Presenter: William Hubbard, New England District

Abstract: Traditional partnerships in USACE water resources development still exist; state, port authority and municipal agencies are still engaged. As the USACE workload diversifies, and cost sharing constraints intensify, discovery of new cost sharing partners require a proactive effort. In the six New England states there is a variety of groups interested in the restoration of aquatic environments and just as many federal programs, including the Corps, to fulfill the need. A description of several efforts through the Coastal America partnership will be presented, including partnering with other federal agencies, tribes, state agencies, corporations and non-governmental organizations will be presented. The use of partnerships to obtain a local cost share will also be examined.

SESSION VI

TIME: Thursday 15 April, 1:30-3:00

ROOM: Maryland - F

TRACK: Watershed / System Assessment

TOPIC: Integrated Water Resources Management & Sustainability

MODERATOR: Leigh Skaggs, Jacksonville District

PRESENTATIONS:

Title: Developing Criteria for Selecting Ecosystem Restoration Sites

Presenters: Rob Newman, Fort Worth District; Shane Hunt, Galveston District

The project sponsor for the Lower Colorado River Watershed Study requested that the Fort Worth District coordinate efforts to identify potential ecosystem restoration sites for the basin. In contrast to traditional, single site ecosystem restoration studies, the local sponsor supports restoration efforts from a basinwide perspective, with many possible sites. Absent other guidance to assist in ranking and evaluation of restoration sites, two collaborating Corps of Engineers Districts and the local sponsor developed approximately thirty ranking criteria to expedite the screening of sites for planning purposes. Each criterion was then grouped into one of five major categories: habitat, cost, function, acceptability, and practicability and assigned a rank and relative weighting. Each major category was then assigned a weighting factor to further assist in the selection of sites that would progress forward during the feasibility stage of the project. Coordination with natural resource agencies was essential in determining appropriateness of the criteria and the weighting factors used. The paper will describe the process used, the weighting and ranking outcomes, and present the preliminary results of the screening effort. Implications for study costs and schedules as well as feedback from resource agencies will also be presented.

Title: Hydraulic and hydrologic considerations in environmental restoration and watershed projects

Presenter: Robert L. Hunt, PhD, Memphis District

Abstract: Dr. Hunt, an instructor for the H&H for Planners Planner Core Curriculum, will demonstrate basic hydrologic and hydraulic principles suitable for an interdisciplinary audience. Demonstrations will be performed using small flume and other devices, with the participation of members from the group illustrating unit hydrograph, channel routing, and the operation of the Tunica, Mississippi weir. Knowing Dr. Hunt's style, his presentation will likely include some down home humor.

Title: Revitalization of Corps of Engineers Projects

Presenter: William C. Holliday

Abstract. As the nation's population increases and its infrastructure grows older, the adequacy and condition of its public works is an increasing concern. The Corps presently has stewardship responsibility for operation and maintenance of about 1,600 projects, and has oversight and inspection responsibilities for hundreds of local flood damage protection (LFDR) projects. The aging of many of these projects generates concerns that some projects may no longer be, or need to be, serving the purposes for which they were authorized and developed; and, that other projects may not be meeting changing needs and opportunities. A study on this issue was undertaken that focused on the varying capabilities of these projects to meet changing water and related land resources needs and priorities, and on the adequacy of

present policies and statutory authorities to ensure improved responsiveness. A report was subsequently prepared that examined the commonalities and differences of the four categories of projects (harbors, inland waterways, lake projects and LFDR projects); policies, guidance and management tools are listed and examined; a framework for revitalization is provided; a programmatic approach to revitalization is summarized; and finally, possible legislative initiatives are discussed. The report has been published as IWR Report 03-PS-1 dated April 2003 and can be found on the IWR homepage at: http://www.iwr.usace.army.mil/iwr/pdf/project_strat_report.pdf Revitalization as used in the report is meant to imply the improvement and/or increase in beneficial outputs, short of project replacement. Revitalization encompasses rehabilitation and restoration, but also includes increased or new beneficial exploitation of underutilized assets.

Title: Integrated Water Resources Management: Definitions and Principles, Impediments and Solutions
Presenter: Hal Cardwell, IWR

Abstract: Because the Strategic Plan for the Corps Civil Works (CW) program seeks to move the Corps towards a more integrated approach to water resources management, and because the Corps is seriously re-evaluating the future of the Civil Works program and how it can best serve the nation, a fresh look at integrated water resources management and its impediments is timely and needed within the Corps. This presentation will report on the results of a policy study that analyzes integrated water resources management (IWRM) and presents it as a process directed toward a goal. Because management can be integrated in many different ways, we present a framework using the axes of time, space, institutions and objectives for examining the degree of integration of management. An analysis of various policies reveals the goal of IWRM for the Corps as sustainability, and suggests various processes or principles that are key to achieving a higher degree of integration in management. Finally we use these principles as a framework to discuss recommendations on how to overcome impediments to more integrated management of water resources. By clarifying the what's and how's of IWRM for Corps employees in the Districts, Divisions and at Headquarters we hope to facilitate the implementation of the CW strategic plan and by extension help the Corps and the nation to get more value from the management of its water resources.