American Water Resources Association
2009 SUMMER SPECIALTY CONFERENCE
Adaptive Management of Water Resources II
June 29 – July 1, 2009
Snowbird, UT

Monday, June 29
10:30 AM – 12:00 Noon
Session 3: International or Transboundary Adaptive Management

1. Adaptive Management and Great Lakes Outflow Management - Anthony Eberhardt, USACE, Institute for Water Resources, Alexandria, VA

During the twentieth century, the levels of the Great Lakes have been modified by outflow management from Lakes Superior and Ontario. The St. Lawrence River Board of Control has used its authority to deviate from its approved regulation plan, Plan 1958-D, to adapt to hydrologic conditions exceeding those upon which the plan was developed. The International Lake Ontario-St. Lawrence River Study which was completed in May 2006, proposed alternatives to Plan 1958-D which would greatly limit the Board's authority to deviate. Substantial work has continued since that time leading to a proposed new Order of Approval by the International Joint Commission and a new plan, Plan 2007. Key to assessing the performance of that plan will be an adaptive management strategy that will evaluate key performance indicators over a fifteen-year period. The strategy will include monitoring, assessment and model-refinement. Collaborative group learning through public involvement will be key to the success of the strategy and possible adjustments to the plan. The on-going International Upper Great Lakes Study, scheduled for completion in April 2012 which will result in alternative regulation plans to the present plan for Lake Superior outflow management, Plan 1977-A, is also considering adaptive management. Although the impacts of a revised regulation plan on upper Great Lakes water levels are anticipated to be small based on historic hydrologic conditions, those which may result under climate change may be much greater and the adaptive management strategy will be tied to triggers linked to potentially more extreme conditions. The strategy is also being developed to include agency response to climatic hydrologic outcomes. This presentation will describe the strategies that are being planned and envisioned as a result of these studies.

2. Collaborative Adaptive Management and Governance for the Kidron Valley/Wadi Nar Catchment Basin - Michael Davidson, Claremont Graduate University, Altadena, CA

The Kidron Valley/Wadi Nar trans-boundary watercourse flows from East Jerusalem to the Dead Sea. It travels through East Jerusalem, Israel, through Arab Israeli communities, through villages within the purview of the Palestinian Authority, and passes by Jewish settlements in the West Bank before discharging all of its untreated wastewater into the rapidly deteriorating Dead Sea; an international lake. Currently, there is no wastewater treatment in effect in the basin. All of the effluent water drains through the Kidron Valley/Wadi Nar basin in open channels. In 2006, approximately 25,000 cubic meters/day (CM/d) drained through the basin from East Jerusalem, Bethlehem and other communities with a combined population of 240,000. In 2015, the effluent is expected to reach 41,000 CM/d with a population of 320,000; in 2035 the projections are a doubling of effluent to 85,000 CM/d with a population of 354,000 people. This inter-jurisdictional trans-boundary water basin has been the subject of much debate and discussion among the Palestinian, Israeli and Bedouin stakeholders of the region. Appropriate technologies for treating the wastewater of the Kidron Valley/Wadi Nar basin have been identified by international NGO's and local academic institutions and governance schemes for the basin have been promulgated. The challenges to reach a joint management regime that can execute the requisite institutional changes for the water basin are myriad and complex. Chief among the barriers to creating an equitable wastewater regimen in the region is the heretofore failure to assemble the affected stakeholders in the catchment basin to develop an equitable, sustainable and integrated approach to managing the catchment basin. Recognizing the paralysis of the parties, the Dead Sea Drainage Authority has proposed to utilize the process of collaborative adaptive management as a tool for providing a science-based approach to manage the shared ecosystem and necessary institutional creativity so that a sustainable, "win-win" management regime can be instituted. Such a proposal to the Middle East

Regional Cooperation Department of USAID has jointly been submitted by Israeli and Palestinian NGO's. This would be the seminal application of collaborative adaptive management in the Middle East.

3. Water Supply Brick Wall: Jordan's Dilemma - Tala Qtaishat, NDSU, Fargo, ND (co-author: Jay Leitch)

Water scarcity is the single most serious natural constraint to Jordan's economic growth and development. Rapid increases in population and industrial development have placed unprecedented demands on water resources in Jordan, a semi-arid country. Water re-allocation, desalination, wastewater treatment, recycling, and building dams can each play a role in extending water resources and prompting improvements in productivity. Most optimization models are designed to help decision-makers plan for an optimal mix of water demanding activities. The potential and feasibility of more efficient water allocation to squeeze more water from Jordan's water sources may have been reached. The further re-allocation of water resources in the name of efficiency may be equivalent to rearranging the deck chairs on the Titanic. There are a number of defined mechanisms and pricing systems to optimize of water allocation, but it appears that in practice no combination of these is likely to provide the answer for Jordan. Likewise, more traditional engineering solutions to water supply augmentation seem to have reached their limits in Jordan. Two potential paths out of this dilemma are the need to establish unpopular and non-traditional shifts in water allocation, and the need to find substitutes for water in production and consumption.

4. A Water-related Information System for the Sustainable Development of the Mekong Delta in Vietnam – the WISDOM project - Claudia Kuenzer, German Aerospace Center, DLR, Wessling, Germany (co-authors: Fabrice Renaud, Gabi Waibel, Steffen Gebhardt+, Thilo Wehrmann+ Michael Schmidt, Harald Mehl)

The Mekong Delta in Vietnam offers natural resources for millions of inhabitants. Strong population pressure, regulatory measures at the upper reaches of the river, and first impacts of climate change lead to increasing challenges for planning authorities and the population. Frequent flood and drought events, limited drinking water availability and increasing water pollution, the loss of species and habitats, such as the decrease of mangrove ecosystems, all have negative effects on people's daily lives. In this paper we present the latest results of the WISDOM project, which is one of Germany's largest projects in the field of Integrated Water Resources Management, IWRM. It is the goal of the project to design and implement an Information System for the Mekong Delta, containing information from various research fields such as hydrology, socio-economy, information technology, and earth observation. 60 scientists and 15 PhD students from over 20 Vietnamese and German institutes jointly undertake research on topics such as flood modeling, time series analyses of water levels, pesticide analyses, analyses of endocrine disruptor contamination, derivation of flood and water quality information from remote sensing data, remote sensing based change analyses, and vulnerability studies. The design of the system – a spatial data infrastructure designed with open source software components – puts the focus on the constant integration of newly generated data from all different disciplines – especially the ones requested by the Vietnamese users located in ministries, planning agencies and provincial water institutions. This enables user-oriented analyses and querying to develop sustainable solutions in the field of resource management. Applications of the system are: • Monitoring of floods and droughts • Analyses of water quality, pollution and sediment load • The improvement of flood prediction via remotely sensed precipitation information • Information of land cover- and land use changes • Observation of settlement development, surface sealing and population growth A thorough integration of natural and social sciences is of utmost importance, since the System has to depict not only changes of the natural sciences- or bio-physical field affecting the water household, but also changes of socio-economic processes affecting the people living in the Mekong Delta.