eFlowNews - Volume 6 Issue 2 **May 2009**

What do you think? Environmental flows and implementation problems

On the eFlowNet Forum you can find the latest threads of group discussions on various environmental flows topics. Read more to find out about problems with implementing environmental flows.

Brian Richter, The Nature Conservancy wrote:

Dear E-Flow Colleagues,

I've begun writing a new paper on e-flow assessment and problems with implementation, and I could use your help in identifying some illustrative examples of the problems I want to highlight in this paper. My premise is that we need to fundamentally re-think the way that we have been specifying e-flow needs and the way they are treated in water allocation systems. I hope that sufficiently piques your interest such that you'll help me identify some rivers that illustrate the problems we are currently experiencing! If you can suggest examples of rivers in which any of the following conditions or problems exist, could you please let me know and send any readily-available reference material you might have that supports the points I'm making?

I would be most appreciative of any help you can offer.

Here's the list of problems for which I'm seeking examples:

1. Rivers for which e-flows have been specified but are only occasionally met due to their junior status in prior appropriation systems

2. Rivers for which e-flows have been specified but are only occasionally met due to a lack of available water (i.e., no high-flow releases made in drier years)

3. Rivers in which e-flow management is being compromised due to unregulated groundwater use

4. Rivers in which e-flow management is being compromised by landscape changes such as urbanization

5. Rivers for which e-flow specifications are intended to differ among wet vs. dry years, but implementation is proving difficult due to uncertainty in predicting future water availability (i.e., will the near-term future be wet or dry?)

6. Rivers in which higher-than-natural flows during the low-flow season (i.e., due to dam releases) are causing ecological problems

7. Rivers for which variable e-flow specifications have been set, but water managers have balked at implementing due to perceived complexity of e-flow requirements

Many thanks!

Brian

Brian D. Richter
Co-Leader, Global Freshwater Team

brichter@tnc.org

Here you can read what other members have replied to Brian's message. To contribute to this discussion, sign into eFlowNet and psot a reply. If you have any questions, please contact **stefanobarchiesi@eflownet.org**.

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eFlowNet discussion series @ 5th World Water Forum

during the 5th World Water Forum. eFlowNet ran a series of discussions on eflows and human well-being at the IUCN Pavilion. Read further to learn what was discussed in these debates.

The Global Environmental Flows Network Discussion Series – Flows for the environment and human well-being? IUCN Pavilion, Foyer 2, Sütlüce Congress and Cultural Center, Istanbul, Turkey

Event Summary and Conclusions

The discussion series provided a forum for dialogue on how flows for the environment are the key to promoting long-term sustainable development and poverty alleviation.

Day 1 – Linking flows, ecosystems and well-being: an introduction
Tuesday, March 17th 2009, 15:00-16:00

Water scarcity is a reality in many parts of the world causing huge social, environmental and economic challenges. The Global Environmental Flows Network (eFlowNet) has produced a paper that explores how goods and services sustained by environmental flows play a central role in supporting human well-being, and achieving the Millennium Development Goals. The environment has been recognised as high priority for water allocations in different countries, but associated policies are often fragmented or not enforced. In particular, ecosystems services appear to be neglected in water legislation. Therefore, it is essential to connect the value of these services to policy tools targeting human well-being. One way to tackle environmental services in policy can be through market-based instruments.

Day 2 – Water resources management and policy [presentation]
Wednesday, March 18th 2009, 15:00-16:00

Preventing conflict between policies is the main driver for harmonizing water institutions. The challenge is to first get a better understanding of watersheds as complex institutional systems, including transboundary contexts. In addition, the lack of solid decision-support data is perceived as a key barrier alongside policy goals that are focused on protecting ecosystems with no account for the services they provide. The comparative advantages of international frameworks such as the UN Watercourse Convention, bilateral agreements and national water acts were examined. Different approaches should be taken between developing and developed countries. This is especially relevant where investment in environmental conservation is perceived as an additional burden alongside current pressures for development.

Day 3 – The risks and opportunities of climate change [presentation]
Thursday, March 19th 2009, 15:00-16:00

A major constraint for incorporating climate change scenarios into environmental flows assessments is the lack of good data. Predictions of climate change at the appropriate scale are highly complex and uncertain. At the same time, adaptation strategies such as increasing water storage capacity are expected to produce large impacts on environmental flows requirements. Timescale was found to be crucial in determining the type of risks and opportunities related to climate change and environmental water allocations. There is a great need to continue raising awareness and support training to build capacity for resilience to climate change. Adaptation not only depends on ecosystems' potential but also the institutional context in a river basin.

Day 4 – The economics of securing environmental flows [presentation]
Friday, March 20th 2009, 12:00-13:00

Valuation methods are important tools to assign values to ecosystem services. It is difficult to translate these outcomes into policy because valuations have a certain degree of uncertainty. There is however no excuse for inaction as a minimum set of information is preferable than no estimates at all. Some mechanisms such as EIAs are supposed to account for environmental costs. Work on replacement cost methods and trade-offs needs to happen to ensure that the burden does not fall on the poor. Government subsidies, mitigation funding and private compensation from sequestration are among the financing mechanisms available. IWRM and adaptive management are other important components within the toolkit. One of the next steps is to ensure political will to uptake the results of valuation studies into policy decisions. In addition, there should be active sharing of research data from valuations.

Day 5 – Conclusions and ways forward
Saturday, March 21th 2009, 15:00-16:00

Given the state of knowledge, progress and uncertainty, among the key areas of interest around environmental flows and human well-being are:

1. The risks and opportunities of environmental water allocations, climate change and the institutional setting of a river basin depend on time and spatial scales;

2. Economic valuations of ecosystem services provide important information for evidence-based policy that focuses around environmental flows and poverty alleviation;

3. The comparative advantages of international, regional and national legal frameworks help design policies that are tailored to implementing environmental flows in the local context.

Environmental Flows @ 5th World Water Forum

Session 3.3.2 at the World Water Forum - Spreading the wealth: How to share the benefits of nature?

- focused on water allocation and specifically on environmental flows. Read more for a summary of the session and to download the presentations.

The first part of the session examined how ecosystem services are imperative to different sectors and the steps needed to coordinate benefit sharing. The second part of the session focused on flows in rivers and how maintaining flows for the environment benefits both people and nature, as well as contributes to development.

Discussions statements were presented and then actively discussed ba participants in roundtables where recommendations based on the discussion statements were drafted. Participants then voted on the recommendations and these were taken to the wrap-up session of Topic 3.3 (Protecting Natural resources).

Part 1 - 14:30-16:30
Introduction - Mark Smith, IUCN

Keynote speakers:
Mrs. Annemarie Moons (Regional minister of the Dutch province of Noord-Brabant) - **Balancing competing water claims in the Dutch South Western Delta**
Dr. Mohamed H. Amer (Advisor to DRI, NWRC, Chairman) - **Problem Facing Nile Delta and the Challenges**

Sub-Convener - Frank Wagemans, Dutch Province of Noord Brabant

Panelists:
Discussion statement 1 - Water for poverty reduction needs healthy rivers
Ganesh Pangare, IUCN

Discussion Statement 2 – Sharing water across boundaries to sustain downstream ecosystems
Engr (Ms) Reba Paul, Executive Secretary, Bangladesh Water Partnership

Discussion Statement 3 – Managing freshwater and coastal areas to meet human and environmental needs
Gonzalo Cid (NOAA) and Miriam Balgos (GFOCI)
The Global Forum on Oceans, Coasts, and Islands--GFOCI-- (Working Group on Linking the Management of Freshwater, Oceans, and Coasts)

Discussion statement 4 - Mechanisms for the re-allocation of water to the environment in river basins
Brian Richter, The Nature Conservancy
WWF, The Nature Conservancy and IUCN

Discussion statement 5 - Impacts of pollution on water resources and ecosystem good and services
Presented by Prof. Dr. Dr. Karl-Werner Schramm (Helmholtz Zentrum München) and Burak Karacık (İstanbul Technical University)

Part 2- 1700-1900
Introduction - Katharine Cross, IUCN

Keynote speakers
Stanley Liphadzi, Water Research Commission
Harrison Pienaar, Department of Water Affairs and Forestry
Water Resource Protection in South Africa

Sub-convener - Thomas Chiramba, UNEP

Panelists:
Discussion statement 1 - Environmental flows and human well-being
Anna Forslund, WWF and Birgitta Renöfält, Swedish Water House
EFlowNet

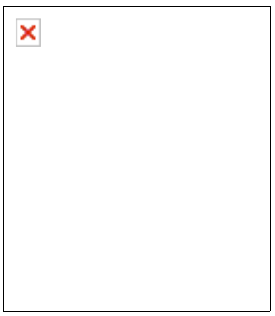
Discussion statement 2 – Environmental flows for the sake of conservation-utilization balance...
Ceren Ayas WWF Turkey

Discussion Statement 3 – Civil society action to mitigate the impact of river sand mining on flows
Dr.Champa M. Navaratne, Dept. of Agricultural Engineering, Faculty of Agriculture, University of Ruhuna, Mapalana, Kamburupitiya, Sri Lanka
NetWwater

Discussion statement 4 – Water for ecosystems: Application of environmental flows for the restoration of ecosystems in the lower Senegal Delta.
Amadou Matar Diouf, Coordonnateur des programmes, UICN Sénégal

Wrap-up of Session

Friends of the Earth and the Jordan River Rehabilitation Project



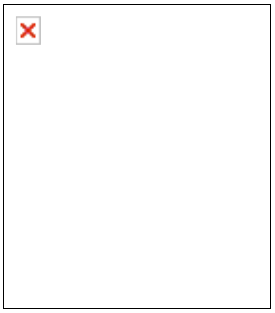
The Jordan River Valley, situated in the Great Rift Valley is of cultural, religious and geographical importance. The river is significant to billions of people from diverse religions and countries worldwide but is presently under threat.

Sadly, in the last 50 years, the River Jordan's annual flow has dropped from more than 1.3 billion cubic meters per year to less than 100 million cubic meters. With Israel, Jordan and Syria, each grabbing as much clean water as they can, it is ironically the sewage that is keeping the river alive today.

Friends of the Earth Middle East (FoEME) has recently embarked on a broad campaign to raise awareness of the demise of the Lower Jordan River. Since much of the river is a closed military zone and off limits to the public, most people simply do not know that the river is drying up.

Click **here** for a list of concept documents, related events and other information on the challenges facing the River.

IHA World Congress June 2009 and other environmental flows events



Read more to find out upcoming events touching on the world of environmental flows. Let us know if there are any events you would like eFlowNet to highlight.

International Hydropower Association World Congress 2009

Building on the success of its previous congress in Antalya 2007, the IHA World Congress 2009 will be open and interactive. It will bring together leaders from government, civil society and industry.

Thought-provoking exchanges will focus on modern water, energy and climate policies, followed by discussion on markets and investment, culminating on the sector's progressive sustainability initiatives.

IHA will offer a one day networking tour on 23 June and a two day post-Congress tour, offering insights into the country's hydro and geothermal development as well as Iceland's unique scenic and historical attractions.

Other Events

UNESCO-IHP Ecohydrology Conference

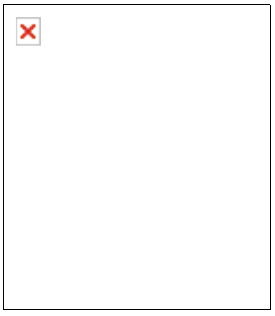
7th International Conference on Geomorphology "Ancient Landscapes - Modern Perspectives"

1st Triennal Symposium for the International Society of River Science (ISRS)

Tell us about events you are attending

We take this opportunity to remind you that we are interested in whether you have attended or are planning to attend conferences in agriculture, mining, hydropower or similar water-intensive sectors where environmental flows concepts, methods, or implementation are being presented. Our aim is to keep track of events where environmental flows are being communicated beyond the environment sector.

The Hydropower Sustainability Assessment Forum



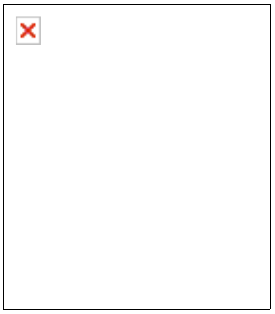
The Hydropower Sustainability Assessment Forum (HSAF) aims to establish a broadly endorsed sustainability assessment tool to measure and guide performance in the hydropower sector.

Both WWF and TNC are involved in the multi-stakeholder process of the HSAF, which is reviewing methods to improve the environmental, social and economic performance of hydropower projects. The influence of hydropower on environmental flows, through siting, design and operations, is a particular focus of this process. A draft Sustainabiliy Assessment Protocol is expected by mid-2009, and endorsement of a final product by early 2010.

For more information visit: **http://www.hydropower.org/sustainable_hydropower/HSAF.html**

Or contact Joerg Hartmann, **Hartmann@wwf.de**

The Global Flows Project



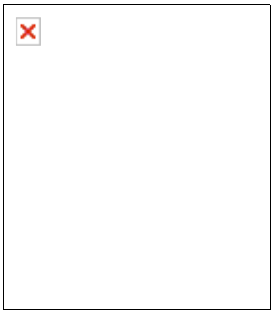
WWF and TNC are leading a project to review countries' legal and policy instruments and their recognition of environmental flows.

Global Flows Project

This international review, the report will draw conclusions on key policy lessons for environmental flows policy. The report will be completed by mid-2009. The first suite of studies will be posted shortly on the **eFlowNet Discussion Forum** for comments and integrations.

For more information, contact Tom Le Quesne (**TLeQuesne@wwf.org.uk**) or Eloise Kendy (**ekendy@tnc.org**)

Introducing environmental flows to planning and watershed management in Mexico



From December 9th to 11th an interactive Workshop – Course for determining environmental flows in the context of planning and watershed management - was held at the Mexican institute for Water Technology in Mexico.

The event was organized by IMTA (Mexican Institute for Water Technology) and TNC (The Nature Conservancy) with participation of the USACE (U.S. Army Corps of Engineers) and WWF (World Wildlife Foundation).

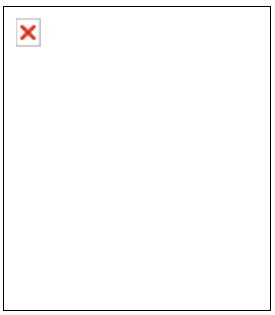
The objectives were to review:

- Main concepts and methodologies
- Information requirements and available data in Mexico
- Overview and interactive training on different tools (IHA, ESWM, HEC-RPT, HEC-EFM and ELOHA)
- Initial case studies in Mexico
- Future challenges and opportunities.

The main instructors were from TNC: Rebecca Tharme, Eloise Kendy, Tom FitzHugh and Leslie Bach; and, from USACE, John Hickey. There was also a contribution from ICE Costa Rica (Instituto Costarricense de Electricidad) with a presentation on the methodology to set compensation flows in rivers of Costa Rica by Any Chaves.

The event was attended by more than 60 people from governmental agencies (The Federal Commission of Electricity, and the National Water Commission), academic institutions, States offices and international nonprofit organizations. The wide range of tools was analyzed and some important criteria were reviewed for their application. Many resources were provided including sharing from software and manuals, references, papers, case studies, presentations, and contacts. Establishing a national environmental flows (EF) network was seen as a priority as well as intensive training and capacity building at different levels. Watershed balances including EF was another issue alongside the need for multidisciplinary work with the involvement of water users and some other stakeholders.

Southern Instream Flow Network, USA



The Southern Instream Flow Network (SIFN) was created by the partners of the Southern Aquatic Resources Partnership (SARP) to develop, coordinate, and support efforts of state-level teams working on instream flow policies and protections.

SIFN was also created to leverage experience and resources among the 15 Southeastern Association of Fish and Wildlife Agencies (SEAFWA) states: Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Missouri, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, West Virginia. This network will become a tool to maximize positive impacts of instream flow policies on the region's aquatic habitat

SARP recognizes that rivers require adequate water flows – known as "instream flows" – to sustain their health. To address impacts to natural flow regimes of aquatic ecosystems, SARP has identified implementation of protective instream flow policies as a priority strategy in the Southeastern Aquatic Habitat Plan. Instream flow policies are administered at the state level and lack national standards to protect natural systems. SARP intends to work with state-based partnerships to institute protective instream flow policies and provide science-based resources to implement those policies.

The objectives, to be achieved by the SIFN over a 3-year period, include the following:

- Bring state teams together to initiate and develop working relationships,
- Educate participants on the scientific basis of instream flow policy,
- Share instream flow policy-related tools & resources specific to state needs,
- Communicate among states to support and build on past experiences,
- Provide training for use of assessment tools to determine environmental impacts to hydrologic regimes and develop instream flow standards, and
- Produce guidance documents for development of effective instream flow protection policy and supporting programs.

Working with partners is key to the successful development and implementation of protective instream flow policies. SARP has joined with other organizations that have also identified protection of instream flows as a priority conservation strategy for southern aquatic habitats. These initially include the Instream Flow Council (**www.instreamflowcouncil.org**), The Nature Conservancy (**www.nature.org**), American Fisheries Society (**www.fisheries.org**), and Southern Company (**www.southernco.com**). Additional partners will be welcomed to the SIFN steering committee and state teams in the future.

For more information about SARP, SIFN and instream flow policy work in your state, visit **www.sarpaquatic.org** or contact Scott Robinson, the SARP Coordinator, at 770-361-5639 or **scott_robinson@dnr.state.ga.us**.

Environmental Watering in Victoria, Australia

Victoria is leading Australia in the policy and practice of providing flows to meet the needs of river health. Read how environmental flows are recognised as a legitimate and essential part of the state's water allocation framework.

About a third of stream flow in Victoria is extracted for irrigation, domestic use, industry and other urban purposes. This reliance on extracted water has taken its toll on the health of Victoria's rivers and groundwater, together with drought, this has created many challenges for the state's water managers.

Scientists today understand that the way in which water flows in a river system is vital to maintaining its physical, chemical and biological health – and, therefore, the communities that rely on it. Victoria is expanding the water it sources from non rainfall-reliant supplies by pursuing innovative water sources such as desalination and recycling as well as stormwater and grey water use. Read more about the "**Our Water, Our Future**" Initiative.

However, water use from natural waterways still need to be balanced in ways that acknowledge the ongoing need for healthy rivers, floodplains, estuaries and groundwater systems. Prolonged drought means Victoria's wetlands, rivers and floodplains – and the plants and animals that live there – are suffering. The Victorian Government's environmental watering program is keeping key sites alive. Read **here** to find out more about the 2007/08 Watering Program and its results.

Environmental water recovery and management in Victoria was also the driver for testing some of the hypothesis upon which environmental flow recommendations have been made for the Wimmera, Glenelg, and Thomson Rivers, as described in this paper: **Webb A. Stewardson M and Koster W. (under review) Detecting ecological responses to flow variation using Bayesian hierarchical models. Freshwater Biology.**

Screening Tool for Reoptimizing Hydropower Dams in Africa

The Natural Heritage Institute (NHI), in consultation with The Nature Conservancy, recently undertook a continent-wide assessment of hydropower reoperation potential in Africa for the World Bank.

As part of the study NHI developed a rapid assessment tool to identify high priority hydropower dams which would be good candidates for reoptimization; where reoptimization involves restoring environmental flows to improve/restore ecosystem functions and services, without significantly decreasing power production. The tool is designed to assess both the environmental desirability and technical feasibility of reoptimization. It is intended to serve as a reconnaissance level of assessment that can be utilized largely with publicly available information.

After developing the tool, it was then applied to the more than 140 large (>15 m.) hydropower dams currently in operation on the African continent. Of these dams, 16 were determined to be promising candidates for reoptimization and warrant further study. The results of the study were verified through

in-country consultations in four if the countries studied (Cameroon, Ethiopia, Nigeria, and Kenya), as well as additional consultations with global dam and environmental flow experts.

In its preliminary phase, the rapid assessment tool was presented at the IUCN World Conservation Congress in Barcelona (Oct. 2008). The tool and initial trial results were then presented in Washington, DC at World Bank Water Week (Feb. 2009) and World Bank Energy Week (Apr. 2009). A final version of the tool and project report will be available soon. For further information please contact Kara DiFrancesco at the Natural Heritage Institute, **kdifrancesco@n-h-i.org**.

Please visit: **http://www.n-h-i.org**

WWF launches new reports on environmental flows

WWF-UK has launched two new reports on environmental flows.

Launch of WWF reports!

During the World Water Forum WWF launched two new reports on environmental flows in WWF Water Security Series:

- "**Allocating Scarce Water - A primer on water allocation, water rights and water markets**" (a re-launch from 2007)

- "**Keeping Rivers Alive - A primer on environmental flows**"

More information can be found on WWF UK website:
http://www.wwf.org.uk/what_we_do/safeguarding_the_natural_world/rivers_and_lakes/

Journal articles by CEMAGREF, France

The Laboratory of Quantitative Hydrology at CEMAGREF Lyon has recently published two papers on the systematic monitoring of instream flow alterations and biological validation of instream flow modelling.

Long-term brown trout populations responses to flow manipulation

Sabaton, C. ; Souchon, Y. ; Capra, H. ; Gouraud, V. ; Lascaux, J.M. ; Tissot, L. (2008).Long-term brown trout populations responses to flow manipulation. *River Research and Applications, 24*(5), 476-505.

Abstract

Despite the many habitat simulations that have been undertaken around the world, not enough biological monitoring has been performed following flow manipulations. It is difficult, however, to refine flow management decisions without a better understanding of the links between amounts, durations and seasonality of flow deliveries and population dynamics. Trout populations were monitored before and after flow alterations in five trout streams, involving 17 study sites over a 4- to 12-year period, depending on the sites. A comparison of the trout populations observed to theoretical Habitat/population models pointed up several helpful lessons. Various factors slow increases in population size, including the availability and quality of spawning grounds, the general connectivity of the bypass section (BPS) and severe spate events. In addition to these site-dependent factors, hydrological dynamics may explain why it is so difficult to clearly identify relationships between habitat availability and real fish stocks. Moreover, opportunities to observe population changes are improved when the pre-enhancement instream flow value is very low, and when there is a considerable difference between pre- and post-enhancement values. A population dynamics model that incorporates different habitat limitations and demographic background can be a very precious tool to improve understanding of the different situations and to build scenarios of population recovery.

Detecting biological responses to flow management: missed opportunities; future directions

Souchon, Y. ; Sabaton, C. ; Deibel, R. ; Reiser, D. ; Kershner, J. ; Gard, M. ; Katopodis, C. ; Leonard, P. ; Poff, N.L. ; Miller, W.J. ; Lamb, B.L. (2008). Detecting biological responses to flow management: missed opportunities; future directions. River Research and Applications, 24(5), 506-518.

Abstract

The conclusions of numerous stream restoration assessments all around the world are extremely clear and convergent: there has been insufficient appropriate monitoring to improve general knowledge and expertise. In the specialized field of instream flow lterations, we consider that there are several opportunities comparable to full-size experiments. Hundreds of water management decisions related to instream flow releases have been made by government agencies, native peoples, and non-governmental organizations around the world. These decisions are based on different methods and assumptions and many flow regimes have

been adopted by formal or informal rules and regulations. Although, there have been significant advances in analytical capabilities, there has been very little validation monitoring of actual outcomes or research related to the response of aquatic dependent species to new flow regimes. In order to be able to detect these kinds of responses and to better guide decision, a general design template is proposed. The main steps of this template are described and discussed, in terms of objectives, hypotheses, variables, time scale, data management, and information, in the spirit of adaptive management. The adoption of such a framework is not always easy, due to differing interests of actors for the results, regarding the duration of monitoring, nature of funding and differential timetables between facilities managers and technicians. Nevertheless, implementation of such a framework could help researchers and practitioners to coordinate and federate their efforts to improve the general knowledge of the links between the habitat dynamics and biological aquatic responses.

Environmental flows at the American Fisheries Society Meeting

Maceo Martinet, a new member eFlowNet is presenting a paper on environmental flows at the American Fisheries Society Western Division Annual Meeting in Albuquerque, New Mexico, May 3-7, 2009.

Maceo C. Martinet, Marilyn Myers, and W. Jason Remshardt - U.S. Fish and Wildlife Service, Albuquerque, New Mexico

Environmental Flows - ecological principles, application, and lessons from New Mexico
(Symposium Title: The legal, political and economic challenges of fish protection and recovery in New Mexico and the way forward)

Throughout the 1960's and 1970's, fish biologists and water resource engineers believed that the key principle to maintaining healthy river ecosystems was to define and protect minimum instream flows for fish species. Following enactment of the National Environmental Policy Act (NEPA) in 1970, attention was shifted from minimum flows to the evaluation of water budgets and multiple uses on federal water projects. Beginning in the early 1990's, research scientists began to advocate and develop an improved approach to river management which focused on the natural flow regime to maintain the ecological health of these systems. The natural flow regime, the quantity and seasonal variability of flows based on annual weather patterns, is the driving force shaping the morphology, biology, and ecology of river ecosystems. One of the primary causes of the ecological degradation of river ecosystems is human alteration of the natural flow regime. The scientific community has embraced environmental flows (i.e., quality, quantity, and timing of water flows) as the key principle necessary to maintain healthy river ecosystems. To ensure sustainable healthy river ecosystems it is imperative that water resource engineers, legal institutions, and the general public understand the ecological principles integral to environmental flows. This presentation will provide an overview of these ecological principles and offer suggestions as to how the institutional and legal framework can adopt these principles. We will also discuss how environmental flow principles are considered in the operations of four major river systems in New Mexic Pecos, Rio Grande, San Juan, and Gila.

For more information on this meeting and the schedule of oral presentations, please visit the **website** of the event.

Contribute to the next eFlow News update - June

We want to get your input for the next eFlow news update. Please send us your information by May 25th.

We want to share more information on what you are doing on environmental flows, including:

- summaries from past events
- upcoming events
- announcements of projects, partnerships
- highlights of new reports, tools, projects
- proposed discussions

Please send all information to Stefano Barchiesi at **stefanobarchiesi@eflownet.org**.

We look forward to hearing from you!

eFlowNet team