FLOW 2008 Pre-Conference Survey Results

The following summarizes the results of an online pre-conference survey administered in September 2008 to *FLOW 2008* conference registrants. The first invitation to participate was e-mailed September 5; on September 11th and 18th, Instream Flow Council (IFC) staff sent reminders to all then-current registrants that had not yet completed the survey. As a result, all who had registered by September 18th (with functional e-mails) received at least one notice encouraging them to provide their input. The invitation was as follows:

> Dear *FLOW 2008* Registrant – To lay an effective foundation for the interactive sessions at the conference, please provide your input to a short **pre-conference survey** accessible via the link below. Please do so at least **by September 19th**, and now is even better. It is short (7 main questions and 1 "bonus" question at the end), and should take no more than 20 minutes to complete. Results of the survey will be presented at the conference. You will only be able to access the survey once, so please complete it carefully. Your survey responses will be strictly confidential. Click here to Start Survey
>
> Thank you in advance for your important contribution. See you in San Antonio!
> - *The FLOW 2008 Planning Team and Advisory Committee*

Crafting the Survey

This survey was developed by the IFC *FLOW 2008* Facilitation Assistance Committee (Peter Aarrestad, Nina Burkardt, and Kathleen Williams), in consultation with the IFC FLOW 2008 Planning Team, facilitator Larry Susskind, and the *FLOW 2008* Advisory Committee. Thanks to all who helped in its development. The authors were determined to keep the survey relatively short and simple, and were advised to use a mix of open-ended and multiple choice questions. They used results and themes from the IFC's International Instream Flow Program Initiative (IIPFI) project as a base for some questions, along with personal knowledge, brainstorming with the Planning Team and Professor Susskind, as well as several rounds of comments from the Advisory Committee.

The result was a survey with seven main questions and a "bonus" question at the end. Each multiple choice option (except geographic region) included an "other" category as an option, including the opportunity for respondents to specify their "other" answer. Each non-demographic multiple-choice question was also followed by a text box that allowed respondents to comment on the question or how they answered it.

Interestingly, advisors were split on whether the survey should include a definition of "instream flow problem-solving". As a result, the one being used was simplified and included in the instructions, but not the body of the survey. It was:

…any process in which implementable decisions are made whereby riverine ecological needs are better served by the resulting water management regime. Ecological needs may not be optimized, and other stakeholders may also gain (or lose) in the decision. Conversely, "failure," means decisions that involve no improvement, or a decline, in the achievement of ecological flow needs.

As noted in the survey invitation, the opportunity to participate closed September 19th, after which the IFC *FLOW 2008* Facilitation Assistance Committee summarized the results. Although there are likely many ways the results could be displayed and interpreted, the authors have only provided some basic interpretation here. Thanks to all the survey participants for sharing their time and insights.

Overall Participation

Of the registrants with functional e-mail addresses encouraged to complete the survey, by September 19th, 250 had viewed it, 208 had started it, and 164 had completed it. The start/completion rate was 79 percent. Beyond two people noting technical issues with it (survey site froze up on them), and one objecting to one required question (thus not being able to continue), there were no further indications of reasons for the 44 dropouts (i.e., started but didn't finish). There were also no indications of reasons some viewed the survey, but didn't participate. For the few registrants reporting access issues to the survey site, staff suggested they try another computer, which seemed to have solved that issue in known cases. Participants averaged 20 minutes to complete the survey.

The characteristics of the survey participants are summarized below.

Geographic Sector

Participants were asked to select one of the following as most representative of the region in which they conduct the majority of their instream flow work. The first five are also the geographic combinations for the Thursday breakout sessions at the conference.

- Western US (AK, AZ, CA, CO, HI, ID, MT, NM, NV, OR, UT, WA, WY, and US Pacific Island Territories
- Midwestern US (IA, IL, IN, KS, MI, MN, MO, ND, NE, OH, SD, WI)
- Southeastern US (AL, AR, FL, GA, KY, LA, MS, NC, OK, SC, TN, TX, VA, WV, and other US Territories)
- Northeastern US (CT, DE, MA, MD, ME, NH, NJ, NY, PA, RI, VT)
- Canadian Province or Territory
- Outside the US and Canada

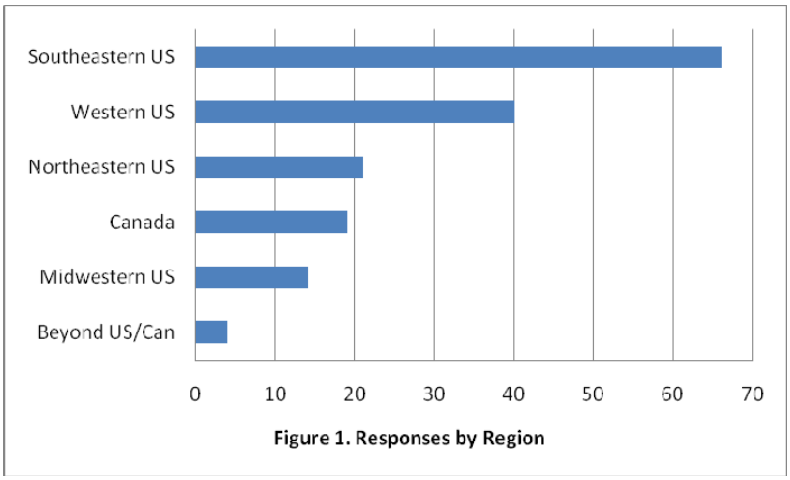

Figure 1. Responses by Region

As shown in Figure 1, the predominant region represented in the survey was the Southeastern US. This may be due, in part, to Texas being included in this region and

a high proportion of registrants being from the state in which the conference is being held.

Economic Sector

Respondents were also asked to select an economic sector that most closely described the sector they typically represented in the instream flow proceedings in which they participate. The sector results include not only specific members of these sectors, but also representatives of private firms (e.g., consultants, attorneys, facilitators, etc.) that typically work for them (and therefore "represent" them in instream flow proceedings).

As shown in Figure 2, almost 40 percent of the respondent pool represented state or provincial agencies, likely due in part to the conference organizer being the Instream Flow Council, the members of which are state and provincial fish and wildlife agencies. The second highest representation (almost 20 percent) was from non-profit and advocacy groups. Although one respondent made mention of a tribal connection, no one selected "Tribal/First Nations" as their primary sector.

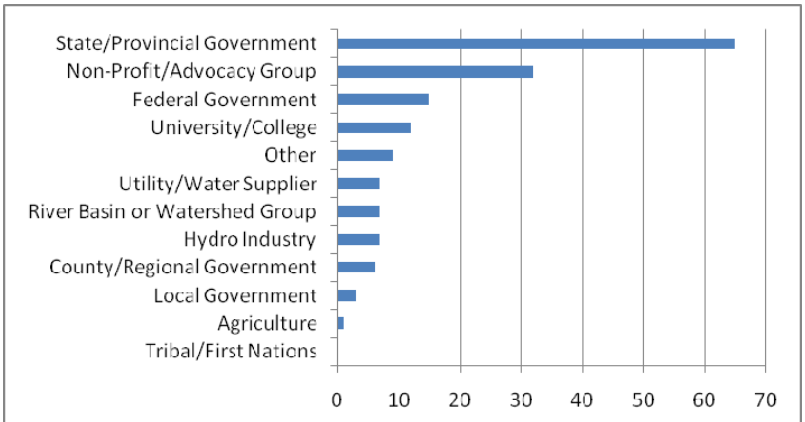

Figure 2. Responses by Economic Sector

The most frequent selectors of "other" represented combinations of the sectors listed, or some other government unit not specified in the list.[1]

Profession

Respondents were asked to select the term that best described their profession as it applies to instream flow work. As shown in Figure 3, almost 60 percent were applied scientists (e.g., hydrologists, biologists, etc.). Another 16 percent were managers or directors. Those specifying "other" included advocates, policy specialists, and people who filled a combination of the above roles. [2]

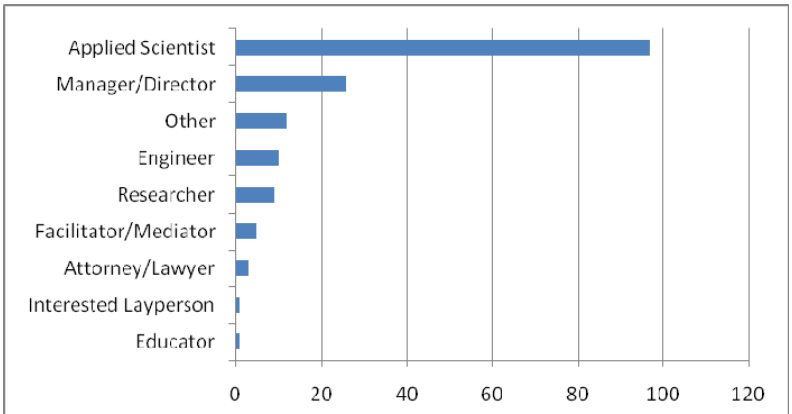

Figure 3. Responses by Profession

[1] "Other" sectors specified were; various industries affecting streamflows by consumptive water use or watershed alterations, consultant; tribal/water supplier/federal government, funder, a split between federal and hydro industry, political subdivision of the State of Texas, River Authority; public relations consultant, Interstate Basin Commission, and various industries affecting streamflows by consumptive water use or watershed alterations.

[2] "Other" professions specified were; environmental advocate, policy/outreach, river region field rep, geologist, data management/GIS, environmental scientist/executive director, advocacy/outreach, watershed planner, advocate, policy advisory, academic with public interest interest.

Top Impediments to Improved Instream Flow Problem-Solving in the U.S. and Canada

Participants were asked to rank from 1 to 3 their top three impediments to improved instream flow problem-solving in the US and Canada, from a list of 13 options, including "other". Those selecting "other" could specify their own choice in a subsequent text box. Options were randomized to avoid order bias. The full text of the options (abbreviated in the figure) was as follows:

- Those advocating for instream flow want too much water
- The science is too uncertain on flow(s) needed for a healthy river and fishery
- Laws are insufficient to protect flows needed by rivers and streams
- Population growth and needs are outstripping supply
- There is a disconnect between land use planning and water supply planning
- The general public does not sufficiently value flowing and healthy rivers
- Climate change is/will aggravate already difficult flow challenges
- Agency priorities/resources related to instream flow are inadequate
- There is insufficient expertise in quantification of instream flow needs
- There is a mis-perception of water 'richness' in some areas
- Management of surface and ground water are insufficiently linked
- There are inadequate distribution mechanisms for IF science and policy info
- Other (please describe in the text box below)

Figure 4 (next page) shows not only total responses to each option, but the contributions to these totals by economic sector. When reviewing Figure 4, note that colors in the legend, when read from left to right, are in the same order of the stacked colors on the horizontal bars. For example, "local government" when represented is to the far left of the bar, and "Other" is to the far right.

As shown, the option most often included in the top three rankings relates to insufficient laws and policies related to instream flows. Incongruous land and water policies were almost tied with disagreements with agency priorities. If only the number 1 ranks are reviewed, the top vote-getter is the same – insufficient laws – but the second-ranking option is growth outstripping supply, followed by a near-tie between inappropriate agency priorities and uncertain science.

It is interesting to note variations between sectors. For example, although laws were the greatest concern overall, no one from the agriculture or hydro industries listed it in their top three rankings (i.e., their colors are missing from that bar). And, when reviewing what these sectors felt most strongly about, agriculture (blue) felt the lack of integrated surface/ground water management, uncertain science, and poor quantification expertise were the greatest impediments. Similarly, the representatives of the hydro sector (orange) felt uncertain science was the greatest impediment to improved instream flow problem-solving.

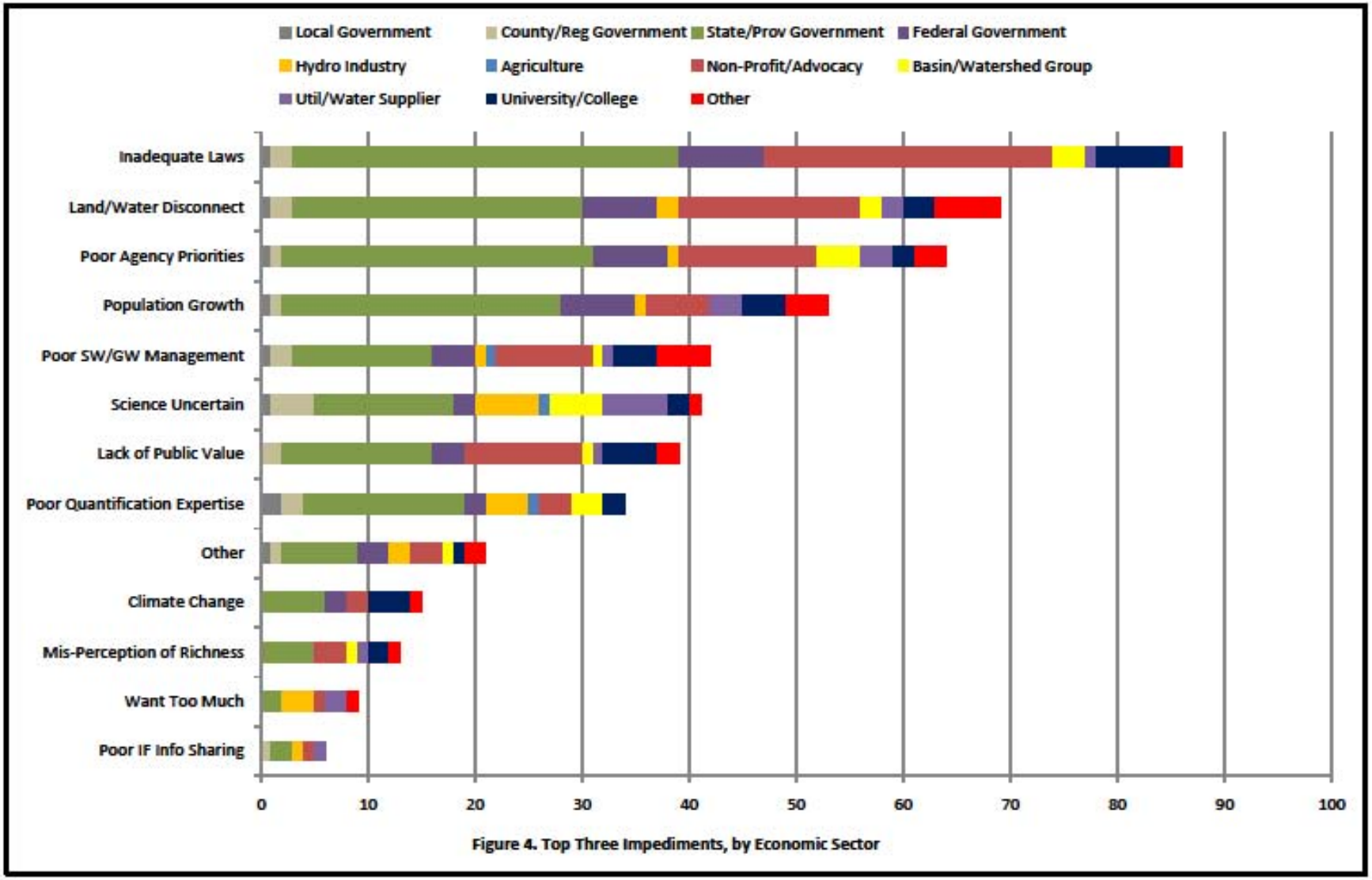

Figure 4. Top Three Impediments, by Economic Sector

Thus, although there was fairly good cross-sector representation through the results, there are some important differences. Are these differences due to real or perceived conditions? Is information inadequate or poorly distributed? Or does the definition of accepted "certainty" vary by sector?

Other top "impediments" listed by respondents included (paraphrased):

- lack of understanding of connections between water use and impact on instream flow
- water demands higher than actual needs
- lack of accountability to balance instream with societal needs
- instream flow as second-class to water development
- agencies recommend more flow than science supports
- pressure for "green" energy development
- flat-line "minimum" flows are insufficient
- users unwilling to compromise
- prior water allocation eliminates options
- insufficient capability to quantify tradeoffs
- lack of resources for robust alternatives assessment
- lack of consensus on definition of sufficient flows
- lack of enforcement
- inefficient water use
- lack of water use measurement
- lack of scientific consensus
- lack of political will to manage growth
- lack of creative thinking
- lack of adequate data for decisions

Themes evident from the comments provided in the text box associated with this question were very similar to themes articulated in the "Suggestions" section of the survey, so are not repeated here.

Top Contributors To Instream Flow Problem-Solving Success and Failure

Moving from broad issues about instream flow to participants' own experiences with problem-solving processes, the survey asked what the top three contributors were to these processes' success, as well as failure, respectively.

Contributors to Success

Again, respondents were given pre-determined lists of options, each including "other" and the opportunity to specify their "other" contributor in a subsequent text box. Options appeared in random order to avoid order bias. The full text of the options (abbreviated in the figure) was:

- All flow needs are documented and justified in easily-understood terms
- There is strong legal and policy support for enhanced ecological flows
- There is broad public support for improved ecological flow conditions
- A less desirable resolution in the courts is likely
- The flow solution would generate broad, clear benefits to many people
- All needed stakeholders are "at the table" and committed to the process
- There is strong, transparent leadership and a clear, inclusive process
- There is enough water that flow improvements can be made without harming others
- Participants understand and accept tradeoffs in the decision
- There is political support for the solution
- The process involves sufficient time and resources to be meaningful
- Other (please describe in the text box below)

Figure 5 shows the tally of respondents selecting each of the options as one of their top three choices. As shown, there was broad agreement that having all players at the negotiation table was a major key to success. The next most important, collectively, was supportive policies and politicians, followed by the willingness to accept tradeoffs, and good leadership and processes. Similar to the preceding question, comments on this question raised themes similar to those raised the Suggestions, so are not repeated here.

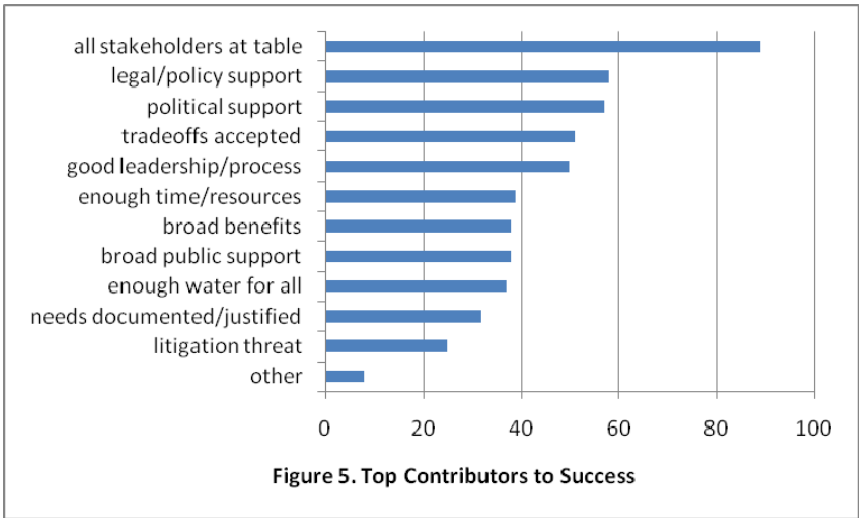

Figure 5. Top Contributors to Success

Contributors to Failure

This question followed a similar format to the preceding questions – asking respondents to rank their top three causes of failure from a randomized list, including "other" and the option to specify. The full text of the choices (abbreviated in the figure) was:

- Insufficient or badly communicated information about instream flow/species needs

- Process was too hurried or did not involve sufficient resources to do a good job
- Needed stakeholders were not sufficiently involved or didn't participate consistently
- Insufficient legal or policy support for the ecological protection/restoration desired
- Alternative scenarios are unclear or not well developed
- Range of potential benefits too narrow to attract needed support
- No formal process for decision-making
- Issues aren't "ripe" for resolution
- Lack of organized leadership or advocacy for resolution
- Participants are too unwilling to compromise
- Other (please describe in the text box below)

As shown in Figure 6, lack of supportive policies topped the collective list, outdistancing the next choices by a fair margin. Some of the same elements from the preceding question exist, but in a somewhat different order of collective priority.

It would be interesting to assess these responses by region and/or sector, but such analyses were not possible in the time between survey closure and when a summary was needed for the conference.

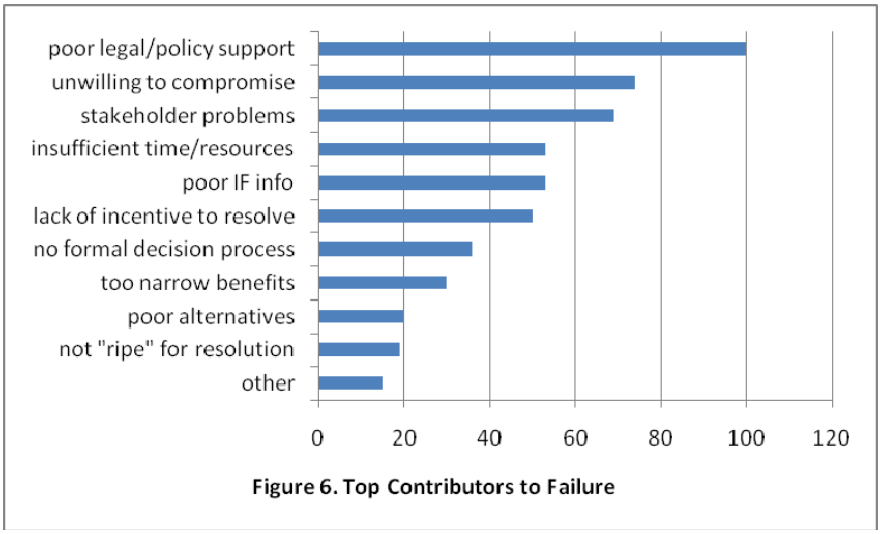

Figure 6. Top Contributors to Failure

Instream Flow Tools

The survey included a question about what instream flow tools respondents felt were most effective in their province, state, or territory. Because this question was a bit more complex (29 options to choose from), and presumed quite a bit of familiarity with policy tools, it was termed a "bonus" question and placed at the end of the survey, following the open-ended opportunities to provide suggestions for the conference interactive sessions.

The 29 tools (abbreviated in the figure) are listed below. Again, respondents were asked to choose their top three, with "other" (and the opporutnity to specify) being an option.

- Reservoir management agreements
- Coastal Zone/Estuary Management Tools
- 401 water quality certification (i.e., Section 401 of the Clean Water Act)
- Local ordinance or regulation

- Water quality restoration planning/TMDLs
- Public involvement/letter-writing campaigns
- State endangered species programs
- 404 permit requirements (dredge and fill)
- Federal endangered species programs
- Navigation requirements or authorities
- Detailed scientific studies/environmental impact disclosure (e.g., NEPA or state-based environmental review requirements)
- Groundwater regulations
- Waterway or basin closures (closures to new diversions)
- Land acquisition (with or without water rights)
- More formal water right administration (e.g., water commissioners, senior users making calls where didn't in the past)
- Objections to new water permits
- Interdisciplinary resource management plans
- Water management agreements with private parties
- Adaptive management
- Inter-jurisdictional compacts
- Outstanding Resource Water (ORW) or similar water quality designation
- Hydro licensing/relicensing (separate from 401 certification)
- Protective land classification (e.g., designation as a refuge)
- Water management agreements with municipalities
- Dam removal and related activities
- State or National Wild and Scenic River Designation, or similar
- Filing for instream flow water rights/licenses or reservations
- Drought management planning
- Other (please describe in the text box below)

As shown in Figure 7 (next page), obtaining instream flow rights far outweighed other tools in effectiveness in instream flow protection/restoration. Hydro licensing/relicensing was collectively ranked next highest, with a near-tie for third between detailed studies and federal endangered species programs.

"Other" ranked quite high in these answers and those who slected it mentioned bothyy tools not listed (e.g., litigation, "federal estate" policy, mandated flow reserves/standards, river basin management plans) as well as more specific or related versions of tools listed (e.g., acquiring (rather than "filing for") water rights for instream flow).

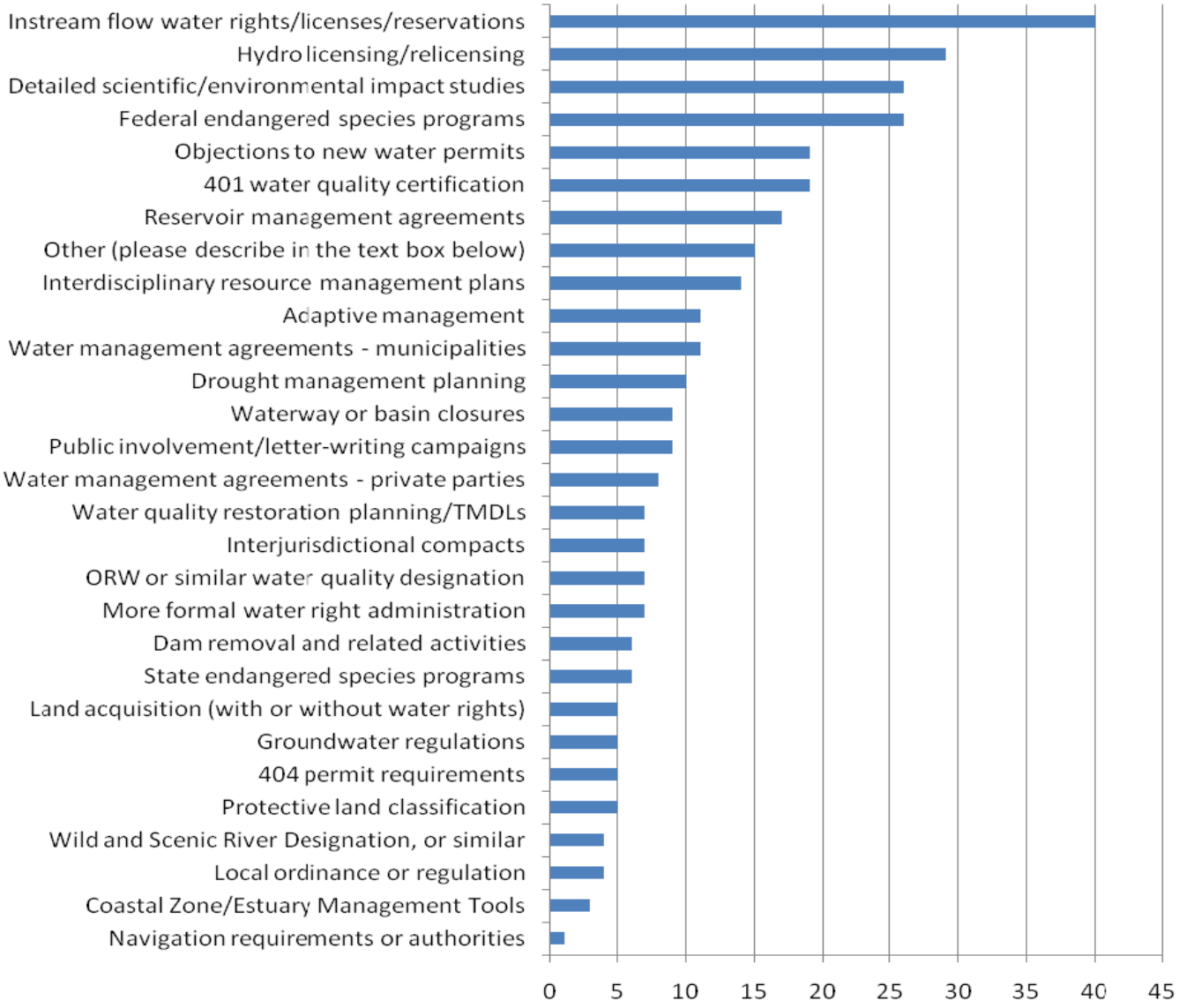

Figure 7. Most Effective Insteam Flow Tools

Suggestions

In an effort to build an effective foundation for the interactive sessions at the conference, the Facilitation Assistance Committee provided survey respondents an opportunity to provide up to three open-ended text suggestions that, in their opinion, would improve instream flow problem-solving in the U.S. and Canada. The specific text of the question is below:

> **Suggestions to improve instream flow problem-solving in the U.S. and Canada.**
> In addition to many traditional conference elements, *FLOW 2008* also incorporates interactive sessions intended to elicit ideas and strategies on how instream flow problem-solving can be improved. So we can all hit the ground running on the Action Planning elements, please provide up to three suggestions below on what needs to happen to improve instream flow problem-solving in the U.S. and Canada. We realize your ideas about this may evolve at the conference, but it will help to know what you think now.

Please be descriptive and specify (if possible) a product or action that should be considered, and who would need to be involved to generate that product or action. Imagine a facilitator asking your discussion group, "What is needed to improve instream flow problem-solving in the U.S. and Canada, either for your work or in general?" What specifically would you explain to him/her?

Collectively, there were 320 individual suggestions. To gain context from the results, the authors classified the suggestions according to one or more themes. This is extremely subjective, and would likely be done differently by anyone (or the same person at another time), but hopefully helps major concepts emerge from the high volume of responses. To remain true to the responses, they are all included in full (with the categories applied) in the Appendix. The authors encourage readers to explore the depth and breadth of the suggestions, to see how their colleagues' suggestions might inform their own opinions and preparation for participation in the interactive sessions at the conference. Seven themes were quite common through the suggestions. These are presented in order of frequency of citing, and described below.

Better Policy – Not surprisingly from the preceding survey results, a high number of respondents either had suggestions or concerns about lack of or inappropriate instream flow policy. Several made very specific suggestions for improvements.

Collaboration/Communication/Coordination – Various suggestions were made for better communication between certain parties, the importance (or not) of stakeholder involvement in instream flow decisions, forming alliances between groups and sectors, cooperative projects, etc.

Public Information/Engagement – Many suggestions dealt with the need to encourage broader public and decision-maker support of instream flow issues and values. Suggestions included specific tactics that could be invoked and potential collaborative efforts

Clear Science for Decisions – As is typical in instream flow dialogue, there suggestions evidenced both the need for good, science-based decisions, as well as hopes for more standardized science that can be used more easily or more broadly in instream flow decisions.

Resources – Many suggestions encouraged greater investment in data collection, research, and agency capacity to effectively participate in instream flow problem-solving. Some included specific suggestions for investments; several noted the need to support stream gauging programs and infrastructure.

Case Studies and Demonstration Projects – There was a strong collective call for the documentation and sharing of case studies of successful and workable instream flow projects and policies.

Values/Benefits/Services – There was also a strong collective call for information, products, and tools to value and communicate the varied benefits of instream flow to stakeholders and the public.

In addition to the above, which represented the highest frequency of themes emerging from the collective suggestions, there were other important themes that may not have been as frequently cited, but could be very useful in improving instream flow problem-solving in the US and Canada. These are listed below in alphabetical order.

Adaptive Management – Several respondents urged the importance of adaptive management, including getting some instream flow protection in place, then using monitoring results and additional learning to adjust recommendations accordingly

Agency Priorities – Quite a few comments related to encouraging agencies involved in water management to alter their priorities and/or investments related to instream flow/water management work.

Assess Response – Within the science-based suggestions there were quite a few that encouraged further work related to assessing species/ecosystem response to altered flow regimes, including incorporating that knowledge into testing and adapting flow prescriptions

Balancing Tradeoffs – There were several suggestions regarding the importance of balance (likely differently defined by all), of being realistic in instream flow proceedings, and of tools available and needed to create a "common currency" to use in such public decisions.

Better Science – Although many science-related suggestions were categorized under the Clear Science for Decisions theme, there were some suggestions that didn't refer to decisions, but purely to better understanding of biological and resource relationships.

Comprehensive Planning – There were an array of interesting planning proposals, and many references to the need to integration land and water planning, to work at a watershed or basin scale, and several references to population growth issues

Creative Alternatives – There were calls and appreciation for creative thinking, unique water management scenarios, and stakeholders that could "think outside the box."

Equal Footing – A subset of the policy category, several respondents specifically noted that instream flow needed to be considered on equal footing with out of stream uses.

Habitat Protection/Restoration – Some respondents commented that healthy habitat is needed before flow restoration, or that flow protection isn't helpful if habitat is poor

Implementation Issues – Some respondents raised practicality issues associated with managing water projects under specific flow regimes, for example.

Information-Sharing – Although related to other categories above, some suggestions were for specific information-sharing networks or needs

National Support/Advocacy – There were several calls for national leadership, national/state cooperation, sharing of federal expertise, national standards, and even reinstituting the Federal Water Resources Council

Process Suggestions – Many respondents provided process suggestions on how specific instream flow proceedings could be made more effective, or critical elements to include in such proceedings

Specific Information Need – Some suggestions were for very specific products or resources that the respondent felt would improve instream flow problem-solving

Technological Improvements – Some suggestions were for very specific improvements to quantification models, suitability criteria curves, etc.

Water Conservation/Reuse – Many respondents made the connection that reducing water taken out of systems, or reusing water, can help solve instream flow problems and provided suggestions for related incentives and investments

Water Quality Connections – Several comments noted opportunities for addressing flow issues through or with water quality policies, or by using water quality policy as a model for potential water quantity policy

Conclusion

There are many opportunities to interpret, compare, re-categorize, and reinterpret these survey results. Time does not allow for more analysis before the conference. However, the authors hope these results will be helpful to conference participants as they consider their participation in the interactive sessions, and we welcome comments and suggestions on how these results could be made more helpful to others.

APPENDIX
Full Text of Suggestions, Categories Assigned

The matrix below contains full text of the "Suggestions" provided by FLOW 2008 pre-conference survey respondents. Some entries were edited to remove presumed typographical errors, as well as to remove references to specific states, provinces, or locales, to preserve anonymity of the respondent. They are listed in the order in which they downloaded from the database. Please refer to the main report for a discussion of the themes.

Comment	Themes
Embrace & enshrine adaptive management. Require an adequate baseline & assessment process to establish preliminary instream flows, and then revisit them after a sufficient period of biological monitoring. De-emphasize the negotiation & attempts to get things 'right' the first time, and ensure that IFN decisions are re-visited (recognizing that 're-visiting & re-vising' decisions is something govt. agencies generally neglect).	Adaptive Management
There needs to be national backing for doing this type of work. Texas has published a document that has been reviewed by the National Academy of Sciences, but what are other states doing? How are rivers that border two states or go from one state to another handled? Shouldn't a holistic approach be taken for the whole river?	National Support Collaboration/Communication
We are still working on selling the idea of instream flow. Tangible reasons (cost benefits) for instream flow that we could take to officials would be useful.	Values/Benefits/Services
Better outreach and education to the general public regarding the benefits of instream flows as well as the costs to society. There is too much focus on specific stakeholders that are affected by an instream flow proposal.	Public Information/Engagement
Place $$ value on maintenance of instream flows and do not use voodoo economics to estimate. Develop sound 'universal' process to determine $$ value for each situation.	Values/Benefits/Services
Discuss a common currency for analytical/problem solving tools: recreation fish, geomorphology, riparian, amphibians, water supply, power.	Balancing Tradeoffs
There needs to be a legal structure that levels the playing field sufficiently to create an incentive for an effective instream flow resolution.	Equal Footing
Development of quantitative methods that allow for better decision making.	Clear Science for Decisions
Need to set legally enforceable instream flow standards to maintain freshwater ecosystem services. That means the standards must be seasonal, and linked to actual ecological functions; not just minimum flows.	Better Policy
Unregulated hydrology as a resource management goal is too vague and difficult to support. Specific events (e.g. 10 day spring overbank flooding)with specific benefits (floodplain wetland maintenance) are much more achievable in a negotiated agreement.	Clear Science for Decisions
Canada - strong legal and policy framework, based on public trust doctrine, developed and implemented jointly by federal and provincial governments, reflecting the shared responsibility for water management in Canada.	Better Policy National Support Agency Priorities
Find ways to manage water cooperatively for both consumptive and instream flow use, such as reservoir releases at times and in amounts geared toward ecological needs. Environmental interests, state agencies who hold ISF water rights and who provide the biological bases for ISF amounts and timing, and water users must participate.	Equal Footing Collaboration/Communication
Too little (next to nothing) has been learned through monitoring the actual (as opposed to perceived) consequences of past flow changes (increases or decreases), so each new process is like the 'first time'.	Assess Response
Adequately resourced multi-stakeholder planning processes.	Resources Collaboration/Communication
Meet with stakeholders more often.	Collaboration/Communication
Explicit inclusion of conflict resolution strategies from CBDM to Dialog and Deliberation methods	Process Suggestion Balancing Tradeoffs
Generation of more information on the requirements for minimizing the impacts of altered flow regimes to aquatic ecosystems.	Better Science
greater clarity re the science-based determination of ecological flow need	Clear Science for Decisions

Comment	Themes
educational campaign to inform people of the consequences of their actions - Each watershed could be portrayed as a fish bowl - where we really can't escape our choices to discharge pollutants are squander water - most people are well meaning, they just don't see there being a problem, until it is a serious one.	Public Information/Engagement
Develop widely accepted standards to define natural (optimum and variable) flow regimes	Clear Science for Decisions
My office is concerned with climate change impacts on flows around the U.S. The lack of certainty and the coarse resolution of especially precipitation projections into the future are quite daunting and we would like to know how useful downscaled projections currently are to those who have used them to see if that is a potentially useful route for other regions.	Clear Science for Decisions
A regulatory process to protect and manage instream flows that was defined by the legislature, and that would prevent inadvertent interference from local politicians.	Better Policy
more policy/legislative 'leverage' - i.e., states implementing instream flow rules that would then strengthen the ecological flow position in problem-solving situations	Better Policy
High flow pulses and other flow regimes, for the most part, cannot be created through water management strategies such as curtailing diversions and conducting reservoir releases. Because of this, make the flow prescriptions simple by determining a sufficient base flow which can be maintained by water management strategies and let nature take care of the rest. (ie. don't over complicate a process that already has a plethora of uncertainties)	Implementation Issues
Rules/laws that are clear and are based in good river science	Better Policy Clear Science for Decisions
Identify the full group of stakeholders needed.	Collaboration/Communication Process Suggestion
Instream flow problem solving must be ongoing. While adaptive management may be viewed negatively, it must be given more consideration especially in light of climate change impacts to stream flow.	Adaptive Management
A much better understanding of flow needs for fish and other critters is absolutely necessary.	Better Science
Develop regulatory 'bright lines' beyond which all stakeholders understand that no additional water withdrawals will be permitted. (In essence, create a flow trading paradigm, but one which does not permit ecological damage.)	Better Policy
Adopt two-dimensional hydraulic and habitat modeling as the standard for assessing instream flow needs for aquatic species	Clear Science for Decisions
I don't have specific suggestions at this time.	
Increased scientific documentation and support/resources in order to justify the reservation of instream and environmental uses to policy makers, stakeholders and the general public.	Resources Clear Science for Decisions
What do you do when you don't have complete science?	Better Science
regional studies and a national database. Would involve state water quality managers, regulators, using data about flow, biotics, of water bodies.	Information/Communication
Some how expand on juvenile HSI curves to incorporate more than just depth and velocity measurements. Instream cover is currently not considered in weighted usable areas or probability of use curves.	Better Science
If there is a good model to use to determine how much a particular stream needs for the health of the whole watershed, I am not aware. So, if that is the case then better dissemination. If that is not the case, then more science and the development of a good model. This would mean that all the appropriate players must be at the table developing this model.	Clear Science for Decisions Information-Sharing
Provide case scenarios of how instream flows were established.	Case Studies/Demo Projects
We can't easily change water law in order to force ISF protection, SO, we need to sway decision makers and political leaders. To do that, we need, #1 better methods to quantify economic benefits (ecosystem services).	Better Policy Values/Benefits/Services
Improve legal framework	Better Policy
Federal resource agencies with 'reserved water right authority could initiate discussions with state resource agencies to initiate potential mechanisms for instream flow evaluations.	National Support Collaboration/Communication
The political processes in these countries must be more supportive of conservation flows. This requires a proactive approach rather than a reactive one. This will require that the endangered species act be strictly enforced.	Better Policy

Comment	Themes
A clear understanding of the legal/regulatory framework (laws, regulations, policies) in my state (eastern water law).	Specific Information Need
Foundation of a long-living body responsible for a watershed, in which all relevant stakeholders are respected and heard. A body that will also consider fields that are not directly related to water management, but are affecting it such as land use, local population management, new businesses, etc.	Comprehensive Planning Collaboration/Communication
Statewide policy/legislation supporting instream flows. Need to be significant political process to make this happen.	Better Policy
A more thorough understanding of the complex biological interactions related to instream flows.	Better Science
Better science that allows for quantification of environmental benefits or risk associated with changes in flows.	Better Science Values/Benefits/Services Balancing Tradeoffs
Collaboration/communication between municipal water suppliers that use the same watershed. Often political (town) boundaries dictate control and planning of water resources but need to plan based on entire watershed.	Collaboration/Communication
Codification of minimum requirements into laws and policies	Better Policy
I would suggest an itemized approach, first is to identify the problem/s, second is know what is given or the situation, third is know what is required, then list the possible solutions or approach. Each item could then be expound to identify the particular needs.	Process Suggestion
Clearly described reasons it is important to maintain instream flows	Public Information/Engagement
Clearly characterize the scientific, economic and socio-political factors in each case - all three 'legs of the management stool' must be present to reach a real solution. Product would be a matrix for each case that covers these key areas.	Process Suggestion
Mandates (and funding) from legislative bodies to state/federal agencies to develop instream flows for specific river segments by specific dates. Multiple state/federal agencies with competing mandates need to be 'forced' to cooperate on these types of studies. They only get this done if their bosses tell them in no uncertain terms that they will get this done. It may not be 'the best' but it will be better than what we have now (i.e. nothing).	Resources Better Policy Collaboration/Communication Agency Priorities
PR campaign focused on why healthy rivers are important, why fish matter, and why loss of water is so damaging	Public Information/Engagement
Share successful state legislation and regulations.	Case Studies/Demo Projects
A means of communicating the social and economic benefits of providing adequate instream flow. Too often the discussion of instream flow is environment versus economy. Tools are needed to better balance the discussion.	Values/Benefits/Services Balance Tradeoffs
Change people's values.	Public Information/Engagement
Recognize that legislation didn't include a directive to recommend instream flow amounts, only to recommend methodology to determine them.	Better Policy?
The process should be facilitated by someone with knowledge in both instream flows and integrative negotiation.	Process Suggestion
More ecosystem-scale, 3-D modeling of habitat use and availability	Better Science
There needs to be an understanding that resolving flow issues will require compromise (and loss) by all parties	Balancing Tradeoffs
an instream flow project in a continental scale	Case Studies/Demo Projects
more public participation	Public Information/Engagement
Clear legislative and policy direction for restoration of IF.	Better Policy
Instream flow problem is expanding currently. Therefore, it needs great care like watershed management, flood control systems, multidisciplinary participation.	Collaboration/Communication?
The Instream flow program / process should be developed and implemented with local leadership, not state or federal leadership.	Better Policy
Need more funding to be available to governmental entities to complete thorough studies.	Resources
More public participation and buy in is needed to improve instream flow.	Public Information/Engagement
Need better data collection system	Technological Improvements

Comment	Themes
Regulatory priority on watershed's hydrologic integrity, i.e. Primacy of the headwaters' functions, watershed connectivity, (4 dimensions; temporal, lateral, horizontal, vertically)retain sufficient recharge and infiltration practices, model for unintended consequences on flow as a result of infrastructure installation, and link adequate flows to water quality and impairment of aquatic uses & Flow TMDLs as remedies. Apply the Precautionary Principle where lack of definitive science justifies 'can't prove it,' resistance. Adopt an Ecological Sustainability ethic that allows an ecosystem to evolve naturally over time and it to recover from perturbations.	Better Policy Comprehensive Planning Water Quality Connections Creative Alternatives
Clearly tie the improvement of instream flow to economic and public health benefits. Build the case for why restoration of instream flow is as important as police, fire, schools, healthcare, etc.	Values/Benefits/Services
Clear science-driven adaptive management with consideration of, but not constrained by, existing water property law. That is, we must recognize that instream flow science, and the ability to define predictive relationships from that science will continue to improve. Instream flow problem solving should be flexible to consider all outcomes from this improved understanding without artificial constraints such as a maximum percent change in appropriated quantities or delivery schedules. Wastewater discharge permits are an example where permit renewals are based on the information present at the time of the renewal, not just the information that was available at the issuance of the first permit.	Clear Science for Decisions Adaptive Management
Need to have the general public recognize that under the current structures aquatic resources are not being protected and be able to explain in general terms that can be related to what those aquatic resources are and why they are important to the public. This can be government agencies or interest groups. Combination of media and meetings.	Public Information/Engagement
'institutionalize' collaborative processes into processes like ESWM, IFIM, FERC process	Collaboration/Communication
We need to learn from and publicize success stories that are relevant to our particular problem cases (e.g., for our local River, we could benefit most from leaning specifics about the process for institutionalizing e-flows in Texas, maybe other Westerns states with similarly (to ours) bad laws, and some specific cases in Australia, and maybe Spain where e-flow is mandatory. [Maybe some twinning programs, or tailored study tours or workshops to bring activists together from very similar locations?	Case Studies/Demo Projects
Increase involvement by advocates in local/watershed groups and initiatives.	Collaboration/Communication Public Information/Engagement
Development of a suite of common tools to establish environmental flows and monitor their effectiveness.	Clear Science for Decisions Assess Response
Educate public, constant propaganda relating isf to their daily lives.	Public Information/Engagement
Real political leadership needs to emerge so that there is a genuine effort to accommodate instream flow needs and resources and policies are in place to facilitate the transition and not just lip service to the problem.	Public Information/Engagement Better Policy
To foster state agency leadership skills to direct more resources to staffing, funding, and attention to streamflow as a priority.	Agency Priorities Resources
Increase timeframe and funding to collect and analyze data.	Resources
State funding opportunities for on the ground comprehensive monitoring and modeling.	Resources
We need to be able to continually monitor and document the variability and range of ecological conditions in waters only affected by natural or global (e.g. climate change) weather and climatic variations.	Better Science
Mobilize state and federal funding for USGS to develop full accounting of water availability and use -- who uses it, when, where, how much.	Specific Information Need Resources
Clearer communication to stakeholders of the results of technical analyses and modeling and the implications of alternative management options.	Collaboration/Communication Clear Science for Decisions
Regulators often don't have the luxury of conducting lengthy, costly studies for a single project. We need guidelines for using IHA - eg % changes in parameters that are acceptable or not acceptable.	Specific Information Need
Greater support at the political and financial levels, as well as among stakeholders, is necessary to bring about policy and solutions to improving instream flows in my province.	Resources Public Information/Engagement
The number of active Water Survey of Canada hydrometric gauges has been cut back and the ones still operating are nearly all on large watersheds.	Specific Information Need
More open and deliberative processes to help a broad range of stakeholders (including provincial, state, and federal employees)understand the costs, benefits, and tradeoffs inherent in protecting instream flows.	Collaboration/Communication Values/Benefits/Services Balancing Tradeoffs
Flow decisions are often made within an institutional framework by people who follow the easiest political path. The better that science can definitively identify flow needs, the lesser the 'wiggle room' for giving away the water.	Clear Science for Decisions

Comment	Themes
Texas needs to be grouped in the Western states - breakout session - not the Eastern states. TX water rights stem from Western States - not Eastern States. We would not be following the same protocol.	
We must communicate better the services that rivers and aquifers provide to society on the whole. If policy makers do not understand the consequences of lack of action, then no changes will occur.	Values/Benefits/Services Better Policy
Improve legal and institutional framework for flow protection	Better Policy
The top water question that many parts of society is where will get the water we need. If we could frame the flow protection issue as a way to define where to get water as well as how much to leave we could garner broad support from water user groups. This would require broadening our tools to include both environmental assessment/identification of thresholds to quantification of water available for off stream uses.	Collaboration/Communication
Wider public support and knowledge about Instream Flow issues. Education efforts need to occur that inform the public about these issues and help them understand their importance and ramifications.	Public Information/Engagement
New and effective water resources legislation:	Better Policy
-Need to better regulate water use by the agri-business industry.	Water Conservation/Reuse Better Policy
-Need to regulate non-permitted water withdrawals.	Implementation Issues
-Need regulated-riparian rights authority to protect and enhance downstream in- and offstream uses.	Better Policy
More support at the state water resources agency level is needed to make instream flow protection a priority. State water agencies should set policy and guidelines that encourage rather than discourage streamflow restoration. To accomplish there needs to be an ongoing discussion between the agencies, state governing bodies, NGOs, landowners, and other stakeholders to develop such guidelines with the goal of implementing them at the state level.	Agency Priorities Collaboration/Communication Better Policy
The largest unknown is often hydrology. With a shrinking state and federal budgets resulting in fewer USGS stream gages, there needs to be better alternatives to measuring streamflow.	Resources Specific Information Need
It is critical to engage all the stakeholders in the process of instream flow problem solving from the beginning and on through to the conclusion. Problem solving won't happen if important stakeholders feel that they did not have a meaningful role in the development of solutions or if they don't believe that their interests and concerns were appropriately considered. Stakeholders must have time to get to know each other and to learn from each other. People need time to understand each other's viewpoints and to have meaningful conversations about their interests and concerns. Once people feel that their point of view has been heard and that they understand where others are coming from, it is easier to have a dialogue that can lead to compromise and real solutions.	Collaboration/Communication Process Suggestion
Ecologically based water supply planning must be effectively incorporated into all levels of government, including local and countywide (where applicable) land use planning efforts. Is needed to minimize politically driven or simply uninformed local land use decisions that often result in over-allocation of gw and surface water to the detriment of surface waters.	Comprehensive Planning
Better explanation of the science to the general public.	Public Information/Engagement
a better understanding that this is an important issues to address by state management agencies	Agency Priorities
A national policy such as Clean Water Act, or NEPA that specifically requires recognition of and facilitates protection of adequate flows to support environmental functions.	Better Policy National Support
A short public announcement type of video that could be shown to community groups or on public television that outlines flow related issues/concerns and solutions/outcomes. Residents along a river, while they may not be decision makers can be a strong local force that influences those making management decisions and law.	Public Information/Engagement
Consider other needs carefully and try to find solutions for those most opposed to yours.	Process Suggestion
Tie inflows to economic gain.	Values/Benefits/Services
Have systematic approach with identified funding to collect necessary data	Resources Clear Science for Decisions
Acceptance of adaptive management policies in the recognition that we don't/won't have all the information needed in the beginning.	Adaptive Management
make available more resources for site-specific studies	Resources
Summary, even in writing after the conference, of what state and federal governments have done and are doing would help individual states and agencies be in touch with the state of the science and relevant issues.	Case Studies/Demo Projects

Comment	Themes
Each participant should focus on their role in improving instream flow and aquatic habitat, not try to solve all the worlds problems, stay within your expertise.	Process Suggestion
Mandate reporting of daily water use.	Water Conservation/Reuse Implementation Issues?
Re-establish the Federal Water Resources Council which was eliminated in 1980-81 by strong political interests who opposed water resource regulation.	National Support
Clear goals	Process Suggestion
IF and other water issues need to be elevated to a level of immediacy in the U.S.	Public Information/Engagement
a broad understanding that what happens on the land (land use / land cover) has a significant effect on quality and quantity of the water in our ground water, surface water, and the flow to the bays and estuaries	Water Quality Connection Integrated Science
I think we need a formula that tells a county or city how many people can live in that watershed based on the amount of water that is available for all instream flow needs.This would require county planners, city and county Mayors, and the general public.	Comprehensive Planning
In my area increased outreach to the Ag community is needed to communicate the value of instream flows and the tools available to improve them.	Public Information/Engagement Values/Benefits/Services
A comprehensive write-up of the various instream flow problem-solving efforts that have taken place in the US and Canada, including an objective write-up of what worked and what didn't work within each and why. Learning from past successes and failures could be very helpful to those working to craft instream flow protection policies and processes.	Case Studies/Demo Projects
More resources for basic research such as baseline and post-project monitoring of the status of biological populations in streams and rivers including their riparian areas	Resources Assess Response
Water rights need to be considered as open for re-adjudication. In Texas they are owned like land, forever. Even if they were granted before the state knew enough to add conditions to the water right, like limited use in drought periods.	Better Policy
Economic value of ecological flows needs to be identified. Bio-economists, water recreational and industrial users potable water suppliers	Values/Benefits/Services
In addition to case study book, IFC should produce periodic (twice a year?) case studies of a river/basin where instream flow work is being undertaken or has occurred, including the science, policy, and stakeholder and public processes that occurred. Make publicly available.	Case Studies/Demo Projects
The scientists and natural resource managers need to establish a good relationship with the NGO's in their area of the country.	Collaboration/Communication
Need to identify a clear process to document the economic benefits of instream flows.	Values/Benefits/Services
Need education for state legislators so that they will pass legislation for state agencies to establish instream flows.	Public Information/Engagement
Need more definitively-identified, scientifically-justified parameters of flow regimes. Need studies that identify specific parameters of flow that are proven to make a tangibly influence health of specific aquatic ecosystems.	Clear Science for Decisions
Additional funding and research on instream flow quantification methodologies.	Research Resources Clear Science for Decisions
remove politicians from process	Process Suggestion
Negotiation approaches and the need for a structured negotiation that the participants have learned or know something about.	Specific Information Need Collaboration/Communication
Funding needs to be provided to allow informed and effective participation by stakeholders who don't have financial support for participation.	Resources Collaboration/Communication
Systematically integrate streamflow standards into comprehensive water management plans.	Comprehensive Planning Clear Science for Decisions
Recognize that humans are part of the ecosystem and that until population growth can be reversed, planning for coexistence of a growing population within a healthy and well managed environment is the only policy that makes sense	Comprehensive Planning

Comment	Themes
Planning processes that bring all actors to the table at the beginning to understand the problem, establish various scenarios (with science input of course) and debate which scenario is most desirable. Process should have legislative back stop for government to step in and protect the public interest/trust in the event that consensus cannot be achieved.	Process Suggestion
Agency budgets need to allow technical training and field work to help their staff understand instream flow methods and be grounded in field experience instead of paper or book exercises.	Resources Agency Priorities
Better use of traditional and local knowledge in planning processes - integrated with and treated fairly and consistently with scientific knowledge.	Collaboration/Communication Process Suggestion
Involve stakeholders in all aspects of the scientific and technologic work and data analysis.	Collaboration/Communication
Inclusion of all interests in discussions related to 'what is the science'	Collaboration/Communication
Generation of more information on the requirements of water users, and methods / options for minimizing flow disruptions while achieving the desired 'product' output.	Balancing Tradeoffs
increased support in general public for protection of ecological flows	Public Information/Engagement
nobody should own water rights - it is the impression that people are entitled to free water - the more people using water - the less there should be for everyone across the board	Better Policy Water Conservation/Reuse
Western water law presents an obvious challenge to preserving environmental flows, particularly on a horizon that incorporates projected climate change impacts. Are there other progressive solutions such as state laws that can also incur the protection of federal law (CWA) such as Washington state's Water Resources Act? And how can laws like this give more precedence to instream flows in a climate of prior appropriation. Perhaps there is a role that tribes can play since more often than not, their water rights haven't been yet quantified and they are senior water rights holders. Maybe there is a niche there that can prove beneficial to tribes and instream flows, and in turn society who would benefit from such protection.	Case Studies/Demo Projects Water Quality Connection Better Policy Collaboration/Communication
A science based decision making process for resolution of instream flow issues.	Clear Science for Decisions
More public outreach/education as to the problem of over-allocation (e.g., photos of dry rivers, fish kills, algal blooms, etc.), as well as dissemination of ideas/strategies for overcoming the problem (e.g., conservation, better land-use planning)	Public Information/Engagement
Species specific information is available and understandable to the general public	Clear Science for Decisions
Begin the process early and allow sufficient time to develop a solution.	Process Suggestion
Instream flow problem solving should not be limited to the determination of an appropriate flow regime. It must also consider how that flow regime will be implemented, monitored and protected.	Implementation Issues Assess Response
Long term and consistent monitoring / research on the same sites/streams is also necessary.	Research
Create permitting processes for water withdrawals that have a predictable outcome for both the environment and proponents.	Better Policy
Use techniques, such as logistic regression, for developing habitat suitability criteria, that correct for biases associated with limited availability of deeper and faster conditions.	Technological Improvements
Creativity in developing mechanisms (through policy, markets, regulation, or more likely a combination of all three) that encourages water to be returned to ecological use in basins/rivers that are already beyond instream thresholds or are over-allocated.	Creative Alternatives Better Policy
How do you turn descriptive science into normative standards?	Clear Science for Decisions
A ranking or flow chart assessment system that could be consistently used on all waters. developed by science. Characterizes rivers, creeks, all waters by certain consistent criteria.	Specific Information Need Clear Science for Decisions
A way that people can continue to disseminate information and good models.	Information-Sharing Case Studies/Demo Projects
Provide an overview of where instream flows were established and a summary sheet that compares the established flows in terms of annual flow, for example were 50% set aside 10% etc.	Case Studies/Demo Projects
accurate, but simple, alternative future scenario analyses - to illustrate trade-offs	Balancing Tradeoffs
Increase public awareness of stream values	Public Information/Engagement Values/Benefits/Services
The nation's stream gauging system needs to be expanded and upgraded at both the federal and state level. Currently federal gauges require considerable non-USGS cost-sharing by other local, state, or federal agencies.	Specific Information Need

Comment	Themes
Government agencies need to increase the number and quality of instream flow specialists. Their analyses and recommendations need to be strongly considered in the review and planning process.	Resources Agency Priorities
Linkages between modeled habitat predictions and ecological response so we can talk to stakeholders about 'performance measures' in terms of populations/communities instead of habitat units.	Assess Response Clear Science for Decisions
Transparency, clear communication of ideas (within/out), and comprehensive consideration of alternatives are essential in all steps toward a solution which involves people.	Process Suggestion
A framework to address instream flow needs that is science-based, and interdisciplinary. How do we design a process that does this (and describes the importance of this?)	Clear Science for Decisions Integrated Science
Further insight/understanding of a common issue relating to conflict between biological and social performance measures.	Balancing Tradeoffs
Education - More attention to educating public and resource professionals on the importance of securing favorable instream flows for natural or other uses.	Public Information/Engagement
We need laws stating that 'it is illegal to cause a stream to go dry'	Better Policy
Support for assessments and basic science for IFN	Resources Agency Priorities
Better development of management options that can result in a win-win condition	Creative Alternatives
Less advocacy on the part of agencies and more science. Tax dollars should go toward solutions, not rhetoric. State agencies should be impartial arbitrators, not stakeholders.	Clear Science for Decisions Collaboration/Communication
Up front cooperation with public/stakeholders to plan and conduct studies. It slows down the process but improves acceptance of results. The important result is that the public & stakeholders learn about the problem (not just the scientists).	Collaboration/Communication
PR campaign on landscaping with less water and chemicals	Public Information/Engagement Water Use/Reuse
Share recently made available, state-of-the-science methods for assessing instream flow through workshops for the states	Information-Sharing
Tools to help change water use behaviour. In many areas water has already been allocated beyond the capacity of the system, requiring shifts in the attitudes and behaviour or users to a positive change to instream flows.	Public Information/Engagement Water Use/Reuse
Develop and advocate a transparent structured decision-making process that can be applied to water management.	Process Suggestion
Recognize that instream flow protection is needed but flow regimes should be determined by good science, recognizing that man can't dictate flows during floods and droughts.	Clear Science for Decisions Implementation Issues
Decisions should be made based on best practicable science.	Clear Science for Decisions
New ways to engage general public (and officials not in biology) in the importance of instream flows, especially in relation to lesser known species and habitats (e.g. non-game species).	Public Information/Engagement
The science on streamflow issues seems fragmented, flow vs. fisheries habitat vs. groundwater impacts. Better integration of the science might help.	Integrated Science
environment education	Public Information/Engagement
more research program	Research
Less reliance on stakeholder processes except to inform legislative and policy direction. Self interested profit motivated stakeholders who will gain by weak IF policies, should not have a strong role in making such policies.	Collaboration/Communication Better Policy
Rules and regulations concerning rivers or watershed should be laid down and put into practices;	Better Policy
Local land owner involvement is critical, especially when it comes to access to representative reaches in a stream segment.	Collaboration/Communication
Need state entities working with river authorities to define process that is uniform. Although each basin is different, there still needs to be a process in place that will be accepted by the state agencies.	Collaboration/Communication
Detail instream flow scenarios which participants can relate to.	Case Studies/Demo Projects
Need stronger laws	Better Policy

Comment	Themes
Organize watershed communities into discrete watershed planning areas, based on Headwaters, Upper, Central, and Lower areas, delineated along sub-watershed boundaries. These WMAs commonly share geology, development and land use patterns and can collaboratively focus on similar watershed programs. This minimizes the number of community representatives simultaneously in the same room at the same table and minimizes the number of issues and methods everyone has to integrate, and eliminates the disconnect between municipalities in the headwaters (maybe forested) having to have to be engaged with confluence towns problems (maybe paved) that is an energy drain. Also, each area can have legitimate priorities and work concurrently in their own areas.	Comprehensive Planning
Better quantification of how impervious surface impacts flow, especially threshold levels for ecological impacts. Then, these need to be clearly linked into land use decision making so that there is a feedback loop. Develop mechanisms to control/shape land use decisions based on flow impacts.	Water Quality Connection Comprehensive Planning Better Policy
Better definition of the term instream flow problem solving. Particularly that 'ecological needs may not be optimized'. If ecological needs can be degraded then one would presume that can be improved/optimized. Any effort to model future condition should be able to optimize the various outcomes of interest. It also seems a bit naive to try an present a single holy grail of “ecological needs”. Different components of the ecosystem will respond differently to different instream flow conditions. Somehow the goal must be quantifiable to both define the goal, and be able to demonstrate success.	Integrated Science?
If possible try to develop win-win scenarios where groups that may be affected either will benefit, maintains their current use or recognizes that both sides gave some. Or actions can be seen as benefiting the greater good and everyone gets credit for it.	Process Suggestion
Develop collaborative tools to avoid the 'black box' and 'expert' dominance in a proceeding	Collaboration/Communication
We need a national-level instream flow initiative (in addition to, and complementing, the Instream Flow Council). An existing environmental group could be encouraged to take this on (e.g., American Rivers, or Environmental Defense, or NRDC), or perhaps a new organization is needed. Particularly with climate change happening, rivers need a strong champion intent on keeping them alive, even as demands for their water increases.	National Support
Enhance case for broader benefits from instream flows - build coalitions.	Values/Benefits/Services Collaboration/Communication
Development of a common training curriculum with associated resources (e.g. a 3-day course).	Specific Information Need
Discuss strategies for streamflow policy support and mechanisms to better balance competing interests for limited water resources.	Better Policy Balancing Tradeoffs
Good flow management options with clear benefits that industry can understand.	Clear Science for Decisions Creative Alternatives
We need to continually monitor and assess alterations in ecological conditions in waters where local management of instream flow are expected/occurring (preferable before the planned changes in flow). By comparing ecological changes in these streams with those in nearby waters not affected by local management (see #1), we begin to accumulate the information needed for adaptive management.	Assess Response
IFC working with NGOs should create clear and compelling case statements that explain why environmental flow protection is essential to our economy and society.	Values/Benefits/Services
Improved ability to predict the consequences of alternative management options in terms of effects on the populations of fish and composition of the aquatic community.	Better Science Assess Response
Demo projects that establish relationships between hydrologic changes and ecosystem response - according to region or ecosystem type.	Case Studies/Demo Projects
Government needs to show leadership and set minimum outcomes to ensure stakeholders can come to agreements that will benefit instream flows. Without this leadership, industry may push the outcome to be less desirable for instream flows and more desirable for economic objectives.	Better Policy
Coming up with a formula for a maintenance flow below a water level control or intake structure that's rational in northern regions where the Spring high flow can be 175+ times the Summer and/or Winter low flows and the industry standard for maintenance flows exceeds the total flow in the watercourse at some point every year.	Specific Information Need
National leadership on instream flow protection is needed. While states and provinces must solve these problems independently of one another, some sort of policy coordination seems crucial.	National Support Collaboration/Communication
Instream flow science has advanced a great deal in the last 20 years. However, the staff resources devoted to working on flow needs determination and problem-solving are minimal. Fish and wildlife agencies and water resource agencies generally say the flow is a high priority issue; now they need to 'walk the talk.'	Resources Agency Priorities

Comment	Themes
Before designing restoration efforts for an unstable river - one should first spend time determining the cause of disequilibrium. This step can be very complex and interrelated with many watershed variables. It is the first step in fixing the problem and a lot of time and effort needs to be put toward this step. Unfortunately, money becomes the issue. All entities have a hard time coming up with the resources to complete this step.	Habitat Protection/Restoration Resources
Better quantify full range of economic, environmental, and societal benefits of sufficient environmental flows to general public	Values/Benefits/Services
We need a focused national effort on developing ecologically based thresholds about how much alteration causes what changes to aquatic communities. This could then be used by management agencies to set specific, numeric standards to be met. The USGS has expressed interest in doing some of this science. If we could get USFWS and USEPA and Env. Canada to invest in this type of work, much as they did for water quality standards, we would get the information we need to craft sound, defensible and workable protection standards.	Clear Science for Decisions National Support Collaboration/Communication Resources
Education of decision makers. Many decision makers and political leaders have little or no understanding of the importance of these issues and therefore make uniformed decisions. Programs to educate decision makers are critical.	Public Information/Engagement
Properly manage growth by linking to limited available natural resources.	Comprehensive Planning
There needs to be greater public education and outreach efforts, that will hopefully impress upon local communities to increase support for state instream flow programs.	Public Information/Engagement
It is critical to have an entity that can convene stakeholders and be an honest broker for instream flow solutions. The Council of Great Lakes Governors was able to play this role in the Great Lakes region. Their process for involving stakeholders and the public and coming up with an interstate compact that will improve instream flows is one worth studying in other parts of the US and Canada. I am sure there are other useful models out there, but this is the one I am most familiar with.	Process Suggestion
Develop an interdisciplinary listserve or other interactive network to serve a broad array of instream flow practitioners, policy makers, and stakeholders. The main purpose would be exchange of information related to instream flow management (IFN tools, policies, etc). Such a listserve would preferably be developed and managed by a coalition of interested groups, rather than by a single entity (to ensure broad or multidisciplinary appeal and to avoid an onerous work load).	Information-Sharing
If ecological flows are to gain momentum, there has to be a better explanation made to the public than 'these are the natural flows; therefore they are the best flows'.	Public Information/Engagement
Return to and emphasize public trust concepts perhaps	Better Policy
Law makers need to be better informed themselves so they understand why instream flow management is critical to stream health and they work to develop the strongest regulations to protect our streams rather than settling somewhere in the middle for fear of asking for too much and getting nothing at all.	Public Information/Engagement
Sell benefits to public.	Values/Benefits/Services
Key federal and state agencies be required to participate	Collaboration/Communication Better Policy
Education on ecological principles ... many of the stakeholders will not really understand the science they are dealing with and will approach from an economic, engineering, or commercial direction (when we know that ecology is inadequately valued in such equations)	Clear Science for Decisions
ensure all stakeholders are very involved in not only the policy aspects but also understand the technical details, particularly the rationale and assumptions leading to recommendations	Process Suggestion
Presentation on the legal principles of the Clean Water Act and how they relate to instream flow problem-solving would be helpful.	Specific Information Need
Provide me with an interdisciplinary team with which to focus on my role	Integrated Science Process Suggestion
Expand the knowledge base of riparian and riverine species' water use (habitat) needs. Including shorter time-scales (diurnal) and unpopular seasons (winter).	Research
Re-establish strong ecological flow research and assessment methodology development programs in appropriate federal and state agencies.	Agency Priorities Resources Research
Sound science	Clear Science for Decisions
Better public outreach and education in most places.	Public Information/Engagement

Comment	Themes
an appreciation for and recognition of stewards of private, open space land as a large part of the solution for our water needs across the board.	Collaboration/Communication Process Suggestion
Each state needs to have their own Instream Flow Legislation and realistic population growth projections. This would require governors, state legislators, regulatory agencies, and the general public to be involved.	Better Policy Comprehensive Planning
Environmental Flow modeling tools that can be applied statewide or to large areas, but have the ability to effectively deal with regional variations and data shortfalls on the smaller scale.	Better Science/Tools
More resources for quantifying env. flow needs	Resources
Technologies that utilize flowing water within ecological parameters need to be demonstrated and refined. Engineers, biologists, hydrologists, water users	Case Studies/Demo Projects
Generate a summary of instream flow laws/policies for all states/provinces	Case Studies/Demo Projects
The scientists and natural resource managers need to persistently advocate that the instream flow issue needs to be at the forefront of the NGO's advocacy efforts and media efforts.	Collaboration/Communication
We all need to realize that we must share the resource and develop management goals that allow for a reasonable level of protection of the natural environment with a reasonable level of development.	Balancing Tradeoffs
Need education for public to get advocacy for ecologic flow needs.	Public Information/Engagement
Need to have all impacted entities represented and together in collaborative efforts to satisfy all uses of instream flow.	Process Suggestion
Incentives for participation, the need for the outcome to be tied to the process.	Process Suggestion
A clear decision framework, based on consensus, needs to be created early on with a facilitator to help stakeholders adhere to the framework and explore alternative scenarios.	Process Suggestion
Water managers need to use statewide computerized decision support systems (like the Texas Water Availability Model or Virginia's HSPF) to know how much water exists at different times and places within their states.	Better Science/Tools
Recognize that instream flow problems cannot be solved until all competing resource issues are identified and clearly defined. This prerequisite needs to be built into any problem solving process.	Process Suggestion
Adaptive management frameworks supported by sufficient monitoring programs and infrastructure (gauges, etc) and easy public access to monitoring data.	Adaptive Management Assess Response
Trust and camaraderie needs to be developed between agencies and consultants to minimize perception-based hostility, as in 'They're all biased idiots' or 'You're only saying that because you're paid to'.	Collaboration/Communication
Willingness on the part of all parties to compromise AND to include explicit adaptive management strategies so that recommendations can be modified as better science becomes available	Process Suggestion Adaptive Management
needs to be very strong incentives for water conservation and making choices which are good for the environment - regulatory burden, higher fees for water - whatever it takes	Better Policy Water Conservation/Reuse
Innovative solutions to water quality and streamflow involving land use practices are being found in areas in the northeast and possibly elsewhere, e.g., Connecticut's TMDL that relies on a % of impervious cover. How successful have efforts like this been and are there institutional frameworks and public support other areas (or lack thereof) that help to facilitate (or hamper) this progress?	Specific Information Need Case Studies/Demo Projects
Governmental (Agency) support for the management of instream flow.	Agency Priorities
Pro-active statewide or regional Water Management Teams comprised of key stakeholders (e.g., water suppliers, farmers, municipalities, state water quality, fisheries and end. spp. staff, etc.) who would work together to develop sustainable water management strategies for each watershed. Each Team would make decisions/develop strategies based on what the future hydrologic cycle for that area is expected to be under climate change models (e.g., in New England, drier summers with more frequent high precipitation events....so possibly focusing on creating a cistern/reservoir system to capture runoff to use/allocate during dry periods - for instream and other uses).	Process Suggestion
Don't let administrative schedules or budgets over ride the time needed to come to a successful resolution.	Resources Process Suggestion
Encourage water reuse and groundwater recharge through new funding mechanisms, regulatory processes that accommodate new technologies in a timely manner, and a coordinated media outreach strategy.	Water Conservation/Reuse Resources Better Policy Public Information/Engagement

Comment	Themes
Give fish and wildlife agencies mandatory authority for instream flow provisions, similar to what land management agencies currently have under Section 4(e) of the Federal Power Act.	Better Policy
Willingness to pursue previously off-limits/emotional subjects around water and water use, including markets and pricing mechanisms, to drive demand toward desired outcomes while still ensuring equitable access across all users.	Creative Alternatives
communication	Collaboration/Communication
Federal legislation that has been crafted by all players and that allocates funds for those that must enforce.	National Support
Present overviews of where instream flows were established and how successful they were in terms of maintaining fish and fish habitat.	Case Studies/Demo Projects Assess Response
#3 good science is the foundation, but it's meaningless without translation into the political realm, and meaningful political support - how do we best engage those politicians and decision makers?	Public Information/Engagement
Increase staffing dealing with instream flows	Resources Agency Priorities
Population/growth planners needs to account for current and future growth patterns in each hydrologic region and make the necessary growth-management decisions to conserve water necessary for heathy terrestrial and aquatic ecosystems.	Comprehensive Planning
Natural and social education of public and officials (to increase the awareness and understanding).	Public Information/Engagement
How do we assign some values (even just conceptually) to ecosystem services for a given system? (i.e. not market-based, although monetary values)	Values/Benefits/Services
Consistency in consultative approach to instream flow problems.	Collaboration/Communication
we need better education and incentives for water conservation. possibly government-funded program for water efficient appliances, bans on outdoor watering, better metering, higher water prices	Water Conservation/Reuse Better Policy
Better public engagement about the benefits of healthy and restored rivers (and consequences of degradation ...)	Public Information/Engagement
Funding is needed to do a better job of developing the science and facilitating an outcome among stakeholders	Resources
More recognition of non-flow issues - more water in poor habitat may not help, and more poor quality water in any habitat may not help either. Putting flow in context of overall habitat quality within a matrix is desirable.	Integrated Science
Recognition of the importance of and a mechanism to allow adjustment of instream flow recommendations based on monitoring of results. Telling scientists they only have one chance to get the answer absolutely right for all eternity dooms the process of developing flow recommendations to taking all of eternity to complete!	Adaptive Management
Better use of CWA to protect water quantity	Better Policy Water Quality Integration
Share successful outreach campaigns, e.g., TV and radio commercials.	Case Studies/Demo Projects Public Information/Engagement
Success stories of watershed planning.	Case Studies/Demo Projects Comprehensive Planning
Improve the science related to understanding environmental flows.	Better Science
Instream flow problem-solving should be an iterative process which adopts adaptive management.	Adaptive Management
At least in New England, long term Fed wastewater policy has run up against flow problems, i.e. regional wastewater facilities made sense as public policy in the 60's & 70's, but they had poorly understood consequences for streamflow. Public policy impacts on streamflow need to be better understood.	Better Policy
participation	Collaboration/Communication
more communication	Collaboration/Communication
Let NGOs fully enter the water rights market to help restore IF.	Better Policy
The government should give great attention on solving this problem. Bottom-up management system has to be implemented to solve instream flow problem.	Agency Priorities
Streamline the federal and state bureaucracies that hold up funding and slow down the process.	Resources

Comment	Themes
Need to make sure that science is the driving force of the study's outcome and that the studies are not rushed by political needs.	Clear Science for Decisions Integrated Science Process Suggestion
Wide range agency involvement and expertise is required.	Integrated Science
Need public understanding and support	Public Information/Engagement
Utilize watershed stormwater authorities, especially in developing or rural watersheds, to 'share the wealth of development,' by exercising a TDR program that establishes headwater areas as 'sending' zones to be protected, and confluence areas as 'receiving' zones, development being the exchange. The stormwater authority has taxing ability, and can redistribute the financial benefits of growth from the high growth 'receiving zones,' to the protected rural ' sending zone.' State Land Use laws would have to allow non-contiguous communities to qualify for multi-municipal project grants. Also, stormwater authorities can implement watershed-wide operation and maintenance programs for BMPs.	Better Policy Comprehensive Planning Resources
Stronger legal/policy protection for instream flow and ecological integrity.	Better Policy
Link other ecological services to instream flow problem solving. Water quality, wetland and riparian maintenance, flood damage attenuation, estuarine health and sustainability of all other instream flow related services needs to be clearly articulated and communicated to all stakeholders.	Values/Benefits/Services
Market and publicize those proceedings that succeeded and monitor the results to show effects to both the social expectation and biological and aquatic resources	Case Studies/Demo Projects Assess Response
Present e-flow as an essential strategy of river management in the face of climate change, to keep aquifers healthy as the best insurance against multi-year droughts (since reservoirs will dry up long before most aquifers)	Public Information/Engagement
Be sensitive to primary role of states in allocation - look for creative ways to preserve and enhance flows within state regimes.	Better Policy (caution)
Development of a collaborative network of intensive research sites to better leverage science investments.	Research Collaboration/Communication Resources
Provide cogent technical Streamflow-To-Go package for dissemination.	Specific Information Need
Examples of Interagency cooperation/buy-in (Feds, State, Local government)	Case Studies/Demo Projects
Is adaptive management a useful instream flow problem-solving tool, and if so, how so? (see Holling's 1978 book: 'Adaptive environmental assessment and management' - other citations in Wikipedia)	Adaptive Management
IFC, NGOs and select state agencies should develop some excellent pilot examples of ELOHA and exhaustively publicize its benefits for managing water resources and protecting economic and social interests.	Collaboration/Communiation Case Studies/Demo Projects
Demo projects that establish a new water supply withdrawal paradigm - ie setting aside a relatively high percentage to remain in the stream and leaving the remainder for off stream uses or storage - instead of the other way around.	Case Studies/Demo Projects Better Policy
Greater federal involvement and leadership from DFO could help push provincial governments toward positive outcomes and policy.	National Support
Continue to push to use the term 'instream flow PROBLEM SOLVING' because that suggests that participants in these processes approach them as a problem to be puzzled through rather than as a battle to be won.	Process Suggestion
The public is generally ignorant of the instream flow issue. Improving public outreach is an important step towards better political support.	Public Information/Engagement
Many streams and rivers are altered due to floods and weather out of our control. Grants or FEMA $$ should be targeted to restoring the river also instead of leaving it in an altered state.	Resources Habitat Protection/Restoration
Greater leadership and political support	Public Information/Engagement Agency Priorities
We need to be able to do a better job of quantifying the high flow needs of rivers -- and do so in a way that recognizes that controlling major floods will remain a goal of society. Can we define that we want to protect the 1 to 10 year flood events to protect natural processes but in most cases manage to mitigate the 11-500 year storm events? We know very little about which flows actually move sediment, maintain channels, and keep habitats healthy.	Specific Information Need
Agency personnel need to find a way to move past just reacting to instream flow issues as they occur and find ways to be more proactive in their programs.	Agency Priorities

Comment	Themes
More field work on flow, habitat, temperature, water quality and host requirements of non-game/T&E species.	Agency Priorities Research Resources
Policies and/or legal safeguards must be established to prevent large corporations or water users from circumventing the process, or derailing efforts completely.	Better Policy
You need to have enough science to have a meaningful dialogue about protecting instream flows and toward what end you are protecting them. There has to be an understanding of surface water bodies, groundwater bodies, and their interconnectedness in the place where you are doing problem solving in order to be able to design solutions that make sense for the place where you are working and that are defensible. On the other hand you can't wait for all the science in order to take action towards solving instream flow problems.	Clear Science for Decisions Process Suggestion Integrated Science
Develop tools (or an outright Info/Education campaign) to build political support for the management of healthy rivers. Not sure how to do this, but would be based on demonstrating the 'quality of life' benefits to society as derived from healthy rivers.	Public Information/Engagement Values/Benefits/Services
Need more salient and poignant Grassroots outreach and education. Need to create a consensus of public conscience.	Public Information/Engagement
Our success stories about management agreements and restored streams need to make it into the mainstream news more often.	Case Studies/Demo Projects Public Information/Engagement
Strongly advocate setting aside wildlife refuges for the public to enjoy, especially in Texas where it's needed the most.	Habitat Protection/Restoration Comprehensive Planning
Make outside Federal expertise available free and readily available to everyone	National Support Resources Collaboration/Communication
Outside the box thinking that allows creative solutions that might not be in the current tool box. Ecological restoration of habitat on a regional basis, for example, would not be considered a means of catching and holding water when on the other hand a dam (at the same expense) would.	Creative Alternatives Habitat Protection/Restoration
Effective communicate environmental flow needs in a manner that puts these needs on the same level as water quality needs, which have been effectively advocated in the past.	Public Information/Engagement
Provide people with better cost/benefit analyses so they understand societal benefits of instream flows in more terms than increased harvest or tourism dollars.	Values/Benefits/Services
Support non-consumptive and local use and return of water and riparian buffers.	Water Conservation/Reuse Creative Alternatives Habitat Protection/Restoration Comprehensive Planning
Re-establish strong ecological flow assessment technical capability in each state, in appropriate state water resource management agencies. Tailor assessment methodologies to support each state's special needs.	Agency Priorities
Willingness to compromise	Collaboration/Communication
Equating IF problems with the general public's quality of life.	Values/Benefits/Services
Species specific flow criteria and how to develop these criteria. This would require biologists working on Instream Flows as well as regulating agencies to be involved.	Better Science Collaboration
Better awareness of policy-makers of the importance of Environmental Flows and their benefits to all sectors of constituents. I would hope this would lead to higher prioritization and better funding of this issue among agencies to enable this type of work to take place in a proactive way.	Public Information/Engagement Resources Agency Priorities
Stronger laws and policies for protecting env. flows	Better Policy
Costs associated with impoundments need to be understood by water users. Biologists, engineers, planners and taxpayers.	Balancing Tradeoffs
Hold (regional?) gatherings to follow up on concepts and suggestions raised at this conference.	Information-Sharing Collaboration/Communication