



Advisory Committee on Water Information Workgroup Concerning the “Shrinking Budget” Predicament

Development of Recommendations to Assure Strong Water Data & Science in a Constrained/Shrinking Budget

List of Ideas

Internal Review by ACWI Workgroup Members For Use in Developing a Draft Report to the ACWI in June-July 2013

May 17, 2013 Draft

This is not the report we intend to submit, it's still just a start –not by any means a comprehensive set of ideas yet! The black text proposes an outline for organizing the Workgroup ideas for a draft report. The blue text presents suggestions provided by Workgroup participants so far. Some of these ideas will undoubtedly be dropped, based upon feedback from the USGS and our own evaluations, and some will

I) Introduction

- Federal Role in Water Resource Science
 - Articulate as many of the “federal responsibilities” as possible; for example:
 - treaties, compacts and trust responsibilities;
 - federal regulatory standards;
 - science needed to support federally funded programs (e.g., Water SMART planning grants & Title XVI projects; FWS consultations and recovery plans under ESA; USFS, BLM & NPS water resource protection);
 - Also, articulate the national advantages that come from federal agency leadership in water science, for example:
 - flood forecasting for interstate watersheds;
 - intergovernmental negotiation;
 - enhanced value of the data collected by OFAs, states, etc;
 - increasing complexity of coping with floods, droughts, sea level rise, WQS, endangered species, recreation flows, etc)
 - innovation opportunity created by federal scientists working directly with water managers to anticipate new decision support needs;
- Sufficient Science to Inform All Other Federally Funded Programs & Projects
 - Develop guidance for balancing the investment in monitoring & assessment with the more attractive/compelling investments in projects & programs; provide options for **dealing with uncertainty** in water resource management decisions; if

funds are limited and more data isn't affordable, help us understand & evaluate the wisest alternatives

- Other ideas?

II) 3 Monitoring Networks

- General
 - USGS already provides **standards and training for data collection**. If they promoted those standards and training more assertively, along with a stronger role for other agencies, organizations and monitoring councils as the basis for others to collect more data themselves, could we offset the loss of (say 10%?) USGS data collection with greater collaborative effort?
 - Encourage WSCs to collaborate (among themselves? with others?) on monitoring site maintenance responsibilities to reduce travel time and expenses.
 - What about a recommendation in the report that the WSCs convene a meeting (meetings) with the state agencies responsible for surface water and groundwater quality and level monitoring and prepare report(s) back to Anne on who is doing what, what the joint priorities are, where there are commonalities, potentials to increase efficiencies or back-up help in case of budget cuts. *
 - Use the Government Accountability Office report as a starting point to understand federal water monitoring and look for gaps and opportunities for collaboration within the federal community as a complement to the above idea for leveraging state-federal efforts. As a gross generalization the GAO report finds a lot of disparate water quality monitoring (some of this may be offset now with STORET-NWIS connection), several nationwide stream flow monitoring efforts (ARS, ACOE, NOAA, USGS) and no nationwide groundwater level monitoring.
 - What about a report on technology options as, I believe, Bob Schreiber suggested.
- Surface Water Monitoring Network
 - **Redesign the NSIP** for the “real (budget constrained) world” to anchor cost-share network (and others) and meet same 5 national goals (including the infrastructure and the related science but not the interpretive applications)
 - Are there collaboration and efficiency opportunities with ARS, ACOE and NOAA, (agencies that also indicate in the GAO report that they have nationwide stream flow monitoring networks)? Should the group suggest that a report be developed by USGS staff to Anne on preliminary discussions about stream gage coordination among these federal agencies and what potential opportunities, including cost savings, or hurdles there may be. *
 - Develop & maintain a clear **monitoring network design description** –people won't support what they can't explain; include network maps & implementation progress assessment in an annual update? Without a unifying design concept, it

appears that USGS operates disparate networks and it is more difficult to know if we are making the most strategic investment of the available resources

- Is there a better way to **select monitoring locations**? State monitoring councils – could they coordinate/prioritize multi-party investments in monitoring more effectively? Shouldn't the GIS-based NSIP site selection study be repeated with current measurement and modeling/estimation technology in mind? Does the PA network optimization study proposal offer a useful approach?
- Is there a more effective way to organize the **surface water and water quality monitoring** responsibilities/staffing? Is there a more efficient allocation of the OSW, CWP, NSIP and surface water quality monitoring program responsibilities?
- Are there **new technologies** that should be accelerated to reduce cost and maintain the quality of our water science for decision making? Remote sensing? Advanced computing techniques at petaflop speeds?
- Groundwater Monitoring Network
 - Should the group recommend that the Groundwater Resources Program and the National Water Quality Assessment Program develop a joint report to Anne on groundwater quality monitoring, building off of the concepts in the updated national groundwater monitoring framework document (currently under development) on **monitoring parameters and frequency** as well as specialized studies? *
 - ?
- Water Quality Monitoring
 - See Groundwater Monitoring Network idea
 - ?
- Network Support Infrastructure
 - ?
- Quality Assurance
 - In a constrained budget environment, there could be a trade-off between the size of the monitoring networks and the **level-of-effort going into quality assurance**. What would the consequences be if USGS reduced the “calibration frequency” by 20-30% (more where the history shows less variation, less where the history shows greater variation)? Could this be assessed in terms of the precision of the resulting measurements and the implication for various types of decisions?
 - If **methods development** does not explicitly consider cost. should the group recommend that lowering costs be recognized as a consideration in this work? *
- Data Management
 - One option for enhancing the efficiency of maintaining and improving the quality of information used in water resources decisions would be to **integrate comparable data sets** from multiple organizations. USGS and others have already made considerable efforts in this area. One example is the development

of the Water Quality Exchange (WQX) and the Water Quality Portal, a cooperative effort of USGS, EPA, and ACWI's National Water Quality Monitoring Council, to simplify access to water information from around the US contained in the USGS NWIS and the EPA STORET data warehouse. STORET is also currently used by state agencies, though its use has been inconsistent. ACWI could propose giving higher priority on encouraging and facilitating full use of, or integration with, these data systems by states and other federal organizations. In addition, the use of metadata standards developed by ACWI's Methods and Data Comparability Board could be encouraged to help maximize the use of available data sets.

- Would the **portal concept** tested by the national groundwater monitoring network be another data management option? Here the original data providers maintain their own data and based on the search relevant data is pulled. Would this have more appeal to non-federal entities? Some of the metadata issues can be massaged by the portal operation to overcome some issues, e.g. the naming of fields being inconsistent. Minimum field practices are set and minimum data elements are identified.
- Should the group recommend the USGS Wisconsin staff or other appropriate USGS staff prepare a report to Anne on the benefits (including cost efficiencies, potential for encouraging collaboration, appropriate circumstances for use of each) of the **USGS-EPA model** and the **NGWMN portal model**? *
- Other?
 - ?

III) "Related Science"

- General
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- Watershed Budgets
 - Is there a way that the Water Census can take pressure off of the streamgauge network? Other monitoring networks?
 - Would it make sense for USGS to invest in the data and science needed, but leave the actual budget development to state and local agencies, watershed organizations and others?
- Ecological Use Estimation
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- Human Use Estimation
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- Flow Estimates for Ungaged Locations
 - ?
- Major Aquifer Studies
 - ?

- Water Quality Assessment
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- Interpretive Studies with Cooperators
 - In light of short-term budget reductions, **defer new interpretive studies** (reduce new starts by 50%?)
- Research & Methods Development
 - The establishment of a **Research, Development and Innovation Subcommittee (RDIS)** is needed to identify or establish initiatives that produce innovations that can be used to reduce costs and maintain adequate data quality for stream gage and groundwater level monitoring by through: 1) The use of new technologies; 2) Enhancement in monitoring processes; 3) Increasing efficiencies in approaches to work; and 4) Improvements in personnel management. The assessment of the opportunity for innovation may have historically been hindered by the lack of applicable innovations that could be beneficial to short-term budget priorities. RDIS will complete its work under the context that identifying short-term innovation opportunities to address the anticipated reductions in water monitoring networks is ideal but may not be achievable. Nevertheless, its work must initiate now and continue to be ongoing to support the monitoring networks maintained federal agencies as fiscal uncertainty will continue to persist into the future. RDIS should evaluate innovation opportunities in the context of economic, technical benefits and cost. Recommendations made by RDIS relative to monitoring innovations shall either improve existing methods of managing water monitoring networks by reducing costs or by producing higher quality data for the same cost.
 - ?
- Other?
 - **Science appreciation** –to what extent must we invest in USGS science applications in order to generate sufficient funding for the monitoring necessary to support those applications and the uses of all other stakeholders?

IV) **USGS Budget for the Water Discipline**

- General
 - Reorganize the **USGS budget request “line items”** to coincide with the presentation outline that USGS proposed for these deliberations
- Monitoring
 - What are the best partnership opportunities that could help maintain or enhance the existing networks? Funding from the **private sector**? Funding from **regulatory** agencies (i.e., build monitoring requirements into the permits)?
- Related Science
 - ?
- Grant Programs

- Cut grant programs (i.e., reduce the federal investment in other agencies and academic capacity) before cutting USGS capability directly?
- Reduce grants to state agencies and other water data providers except where the recipient can leverage funds substantially, help achieve greater efficiencies and fill data gaps?
- Water Resource Research Institute funding for research? Should this be looked at for potential leveraging or as a potential target for cuts (typically, the Administration proposes to cut and Congress sustains funding)?
- Water SMART grants?
- Mapping grants?
- New Initiatives
 - Water SMART Watershed Budgets? Investigations to advance river science? Regional Geographic studies?
 - National Groundwater Monitoring Network?
 - NAWQA?
 - LANDSAT?
- Funding Sources
 - **Insurance Industry** –they are highly vulnerable to climate change and our responses; these are largely unquantified risks they are trying to insure. Evan Mills writes in December’s Science magazine that the average annual worldwide cost of weather catastrophes has doubled each decade since the 1980s, and that the insurance companies are investing in the data, models computing capacity and human talent to quantify, price and communicate climate risk. Is there a partnership opportunity here; who could lead/maintain this partnership? Is DHS/FEMA a good source of info? Please consider adding the idea that **DHS/FEMA could provide some key information toward demonstrating the \$ benefits of having USGS water data** – based on the very strong linkage between the:
 - data for sufficient model-accuracy and the setting of (and collecting of) flood insurance premiums, AND
 - improved ability to predict impacts toward the setting/collection of insurance premiums.
 - **“Follow the money”** –leverage the ‘drivers’ causing spending of money on projects, programs, etc – especially programs involving licensing, permitting, and any type of regulatory approval.
 - Brainstorm with collaboration-minded representatives from **private industry**, consultancy, and utilities– especially if the sessions operate in a listen-to-them mode, and then deliberate with an open mind; may be more long-term than short-term, because of the lead-times involved, but short-term possibilities may be revealed. Following sectors should be considered for a greater degree of leveraging – partly because of the money involved in each of them, and also because of them generally being representative of the “regulated community” as opposed to being part of the “regulatory government” sector. *USGS Strategic Direction 2012-22* demonstrates good collaboration and leveraging exists

already; can be enhanced, and perhaps dramatically, by focusing efforts on the following sectors:

- Energy;
- Agriculture;
- Defense;
- Health;
- Utilities (water/wastewater; solid waste)
- Other??
- State **monitoring councils** might also be able to identify new funding sources and recommend more strategic investment of the available resources (\$ and FTEs)
- Other?
 - **Personnel Resources**– Significant need for mitigating attrition and reversing the effects of hiring restrictions and/or lowered budgets. Links up many stakeholders, toward getting more young persons interested in and committed to careers in water science and engineering, as well as planning, policy, legal/regulatory, and similar careers.

V) **Overall Approach to the Recommendations**

- If, based on the six reports provided to Anne (see starred items above), USGS staff is not able to recommend a path forward that maintains or, in some cases, moves toward nationwide monitoring of stream flow, groundwater levels and water quality at a funding level 5% below current amounts, then USGS staff should recommend specific reductions to interpretative reports and/or localized cooperative projects to account for the needed 5% reduction.

VI) **Future ACWI Consideration**

- these nations may be worth checking in terms of their experiences, including lessons-learned (e.g. “privatization didn’t work and here’s why”), and possible cost-benefit devts, as well as suggestions for persuading national governments and/or partners/stakeholders to “up the ante” for data-collection:
 - EU/EC member States – especially Germany, Austria, the UK, Ireland, the Netherlands, and Poland.
 - New Zealand.
 - South Korea.
 - India.
 - Brazil.
 - South Africa.
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