ACWI Workgroup on USGS Monitoring Challenges in a Shrinking Budget Environment
Teleconference
6 May 2013

Attendees:

Robert Mace, WSWC	Brandon Kernen, ASDWA	Judy Campbell Bird, ACWI-NCL
Wendy Norton, USGS	Bob Schreiber, ASCE	Mary Musick, GWPC
Bill Cunningham, USGS	Dave Carlton, ASFPM	Steve Heiskary, NALMS
Bill Wilber, USGS	Dave Wunsch, AASG	Steve Dye
Mike Yurewicz, USGS	Dwane Young, EPA	Tony Willardson, WSWC
Pixie Hamilton, USGS	Fred Bloetscher, AWWA	
Sheri Alcalde, USGS	John Wells, ACWI-SWRR	

Action Items:

- All – We still need everyone to fill out the assessment tool and return it to Peter Evans and Wendy Norton.

Introductions and Agenda Review

- Robert Mace acted as chair for this session and reviewed the agenda to start the meeting.

Revision/Acceptance of Notes from April 29 Meeting

- Minutes from last meeting were accepted/approved.

Innovations, R&D Subgroup Progress Report – Bob Schreiber

The presentation slides are available here: http://acwi.gov/monitoring-challenges_wkg/minutes/acwi-schreiber-innov_r&d_rpt_2013-04-22_v2-final.pdf

- We encourage additional feedback through phone calls, emails, etc., in addition to feedback given immediately following this presentation.
- Even if some of our ideas need to be implemented in the long term rather than soon, we'll need to make some concrete plans that will allow us to begin some of those longer-term ideas now.
- We need to include outside-the-box thinking, especially when it comes to R&D innovations.
- We also need to be willing to re-explore options that have been mentioned before have been discarded or put "on the back burner."
- We certainly need to consider funding when we talk about innovations and R&D for monitoring programs. We should also consider data quality issues, and the potential to involve/leverage partners in the private sector and academia. We should always be aware of the market forces that drive our monitoring programs.
- Case studies examined by the subgroup included:
    - A nitrate probe evaluation in which USGS played a role. There may be an opportunity to develop this type of evaluation into a larger program, by collaborating with partners.

We must bear in mind that the Federal Government role and program drivers are different from those of the private sector.

  - The X-Prize for Space Travel. In a case such as this, USGS might be the evaluator ***or*** an applicant for the prize (depending on who sponsors the competition). Private and academic sector drivers in this case are competition and recognition, as well as the monetary value of the prize.
  - Service to other agencies, in the model of the USGS CIDA and USDA Service. This type of collaboration allows budgetary savings, along with other benefits.

- Brainstorming ideas – technology and tech transfer. Ideas to continue exploring are remote sensing of streamflow; more use of smart phones and tablet computers; education and training, especially for maintaining certifications; Federal agencies as "rate payers" for training, data, etc.; cost and quality of data collection by non-USGS entities; leveraging more from NSF, NRC, and others.
- Recommended approach is to select the appropriate model program that has representation from all sectors; ACWI would provide oversight and guidance, and USGS would play multiple roles (education/training, testing and vetting, etc.). See slide show graphics #11 and #12 on recommended approach based on the structure for the National Groundwater Monitoring Network http://acwi.gov/monitoring-challenges_wkg/minutes/acwi-schreiber-innov_r&d_rpt_2013-04-22_v2-final.pdf).
- If anyone has additional ideas or comments (especially short-term ideas that we could highlight for our report to ACWI), send them to Bob Schreiber after the meeting. We might need to cut additional items in order to provide the flexibility for funding some ideas for long-term innovations that could help us in the future.

Review of Ideas Provided from the Workgroup

- We can organize our recommendations document any way we wish; we do not necessarily need to organize it according to the issues and suggestions in Anne Castle's letter.
- We need to have our initial recommendations in Anne's hands by early June.
- Some of the ideas on the "ideas list" may actually be in conflict (implementing one might counteract others). We need to figure out which ones to use and which ones to jettison.
- Reducing funding to States and other data producers conflicts with recommendations to get data from States (i.e., if we reduce their funding, we can't ask them to collect the data for us).
- Do we want to recommend something that would be useful, not only in the short term, but also in the future?
- See mark-up of attached "Ideas List" for additional notes and comments from this meeting.

Plans for Next Meetings (May 13, May 28, Jun 10 and Jun 24**)**

- **Next meeting is May 13 at 1:00 pm Eastern Time.**

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

April 29, 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

a. 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;
  - [add something on economic development]

Comment [wen1]: Title XVI does include groundwater recharge projects, as discussed during the meeting

Comment [wen2]: Redundant? May need to delete this word.

Comment [wen3]: Need to acknowledge that we have to preserve the methods development that is needed in development of decision support tools.

- Add something about States that are cooperating with USGS and relying on USGS to do virtually all of their monitoring. This model works well for some States but not for all.
- May want to include something in Introduction about eliminating duplication/overlap.
- Need to get the word out to everybody about the good things that result from USGS monitoring efforts.

b. 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

c. Other ideas?

Comment [wen4]: Do we want to recommend something that would be useful, not only in the short term, but also in the future?

II) 3 Monitoring Networks

a. General

i. 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?

Comment [wen5]: Perhaps the States that can afford to do their own monitoring should do so, thereby freeing up USGS funds for those areas of the country that can NOT afford to do their own monitoring.

ii. Encourage WSCs to collaborate (among themselves? with others?) on monitoring site maintenance responsibilities to reduce travel time and expenses.

iii. 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. *

iv. 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.

v. What about a report on technology options as, I believe, Bob Schreiber suggested.

b. 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?

c. 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? *
   - ? [See ideas above under Surface Water Network]

d. Water Quality Monitoring
   - See Groundwater Monitoring Network idea

Comment [wen6]: Need to mention the improvements that have already been in the data management QA arena, through the use of new work processes and new technology. Continuing on this path is already a high priority for USGS (and this group could learn more about it by talking to Robert Mason).

Comment [wen7]: Are there Federal agencies that you have agreements with for maintaining and servicing USGS streamgages? Yes; Robert Mason needs to confirm this, but we think Bureau of Reclamation operates some of our gages in the West.

Are there major programs/agencies that have NOT been leveraged yet? Probably not; a large proportion of our monitoring funding already comes from other Federal agencies. But in terms of nutrients, there might be a potential for this (perhaps Bill Wilber can answer this question).

The biggest untapped source of new partnerships is probably the recreation community. USGS staff are already looking at this as a possibility.

Another option in addition to NOAA/NWS and NRCS (Snowtel sites), there may be other chances for collaboration on gage maintenance if we pair up with organizations that have snowpack gages.

What about EPA (NPDES Program monitoring) collaboration? Clean Water Act (TMDLs etc) is a huge driver, and EPA is a key player along with the States. How does EPA's work in this area dovetail with USGS monitoring? This might only be a source of collaboration in those States where NPDES has NOT been delegated to the State and EPA is doing the monitoring themselves.

NOAA's National Estuaries Program is also a major driver in many parts of the country and could provide a partnership opportunity.

Comment [wen8]: Not all States have monitoring councils – we may need to list another alternative here. Also, this point isn't very clear in terms of how it would save money; we may need to offer a concrete example – for example, better coordination can help eliminate the need for multiple trips to a site.

USGS offices are already closely aligned with local stakeholders and are "plugged in" to local needs, in addition to being bound by Federal priorities and interests.

- ? [See ideas above under Surface Water Network]

e. Network Support Infrastructure
   - ?

f. Quality Assurance
   g. 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?
   h. 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,

Comment [wen9]: USGS and EPA are collaborating to talk with States that don't use WQX, to convince them to enter their ambient WQ data into WQX so it can be shared.

Comment [wen10]: A national portal is an ideal role for USGS to play, but providing a portal is only half the battle --- you also have to make sure that all the States have the resources (financial and human) to participate. Meta data also is extremely important when you are providing diverse data through a portal, and requiring the inclusion of meta data may be a bar to some States participating.

potential for encouraging collaboration, appropriate circumstances for use of each) of the **USGS-EPA model** and the **NGWMN portal model**? *

i. Other?
   - ?

III) "Related Science"

a. General
   -
b. Watershed Budgets
   - Is there a way that the Water Census can take pressure off of the streamgage 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?
c. Ecological Use Estimation
   - ?
d. Human Use Estimation
   - ?
e. Flow Estimates for Ungaged Locations
   - ?
f. Major Aquifer Studies
   - ?
g. Water Quality Assessment
   - ?
h. Interpretive Studies with Cooperators
   - In light of short-term budget reductions, **defer new interpretive studies** (reduce new starts by 50%?)
i. Research & Methods Development
   - ?
j. 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

a. General
   - Reorganize the **USGS budget request "line items"** to coincide with the presentation outline that USGS proposed for these deliberations
b. 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)?

c. Related Science
   - ?

d. 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?

e. New Initiatives
   - Water SMART Watershed Budgets? Investigations to advance river science? Regional Geographic studies?
   - National Groundwater Monitoring Network?
   - NAWQA?
   - LANDSAT?

f. 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)

g. 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.

Additional thoughts submitted after the meeting by a workgroup member:

We should use the introduction to boldly lay out three overriding potential directions for USGS as the fundamental choice our leaders will need to make when they consider the USGS budget. This will frame the decision as one of significance and not merely a question of whittling here or there. While we should craft them carefully, my "straw man" directions would be something like:

1. Recognizing USGS as THE national center for the collection and interpretation of water and land based science information

2. USGS as the federal water science partner and advisor (This is intended to be something like the status quo.)

3. USGS as the enabler of sound water science data collection and interpretation.

Once these role choices are clearly delineated, we can present ACWI with three sets of budget recommendations consistent with each scenario. For example, under the first potential role, we might suggest that the USGS budget not be cut at all, but instead be delegated various responsibilities from other federal agencies that monitor or contract for the monitoring of water resources. (I'm thinking of the Dutch model here.) Under the third scenario, for example, we would place greater emphasis on USGS defining standards and practices for monitoring site selection, evaluating the use of technology, QA/QC, etc. and letting others do the actual monitoring (i.e., show cuts or transfers from these areas). While we might not think we can go too far with the first scenario, it would be useful, I think, to put it out there for consideration.