

The Johnson Foundation at Wingspread Environmental Forum Working Session #3 *Examining U.S. Freshwater Systems and Services – Agriculture and Food Production*

September 1–3, 2009

MEETING HIGHLIGHTS

Background

The Johnson Foundation Environmental Forum (Forum) is designed to focus national attention on how the U.S. manages freshwater resources and services. Through a series of in-depth forums, The Johnson Foundation is working to build a platform of broad understanding, collaboration and cooperation around priorities for addressing the challenges that threaten our nation's freshwater resources and the health of our communities. The Forum will bring visibility to the complex issues facing the nation's freshwater resources, illuminate possible solutions and catalyze a wide range of actions that together will result in change.

A cornerstone of the Environmental Forum will be The Johnson Foundation Freshwater Summit, to be held on June 8 and 9, 2010, at the historic Wingspread Conference Center. At the Summit, national leaders will convene to deliberate and highlight the priority goals the U.S. must meet to attain freshwater resilience by 2025. A national call to action on freshwater is expected to be issued at the end of the meeting.



Conferences that Inspire Solutions

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To ensure that the deliberations at the Freshwater Summit are based upon the best possible information and options, The Johnson Foundation is convening a series of working sessions comprised of eminent scientists, policy makers, and practitioners of diverse perspectives. The outcomes of these sessions will inform discussions at the Summit and build the platform for creating a national agenda. The first session, “Impacts of Climate Change on Freshwater Resources and Services,” focused on understanding the available science and relevant expertise at the intersection of climate change and freshwater resources. Participants explored what we know and where the gaps are in our understanding of the challenges emerging for freshwater resources and how climate change does or does not exacerbate them.

The outcomes of the first working session informed The Johnson Foundation’s determination of which freshwater issues are particularly urgent and ripe for our nation’s leaders to address in the coming years. The second working session focused on water infrastructure and the built environment. The balance of this document provides highlights from Working Session #3, which focused on the intersection of freshwater with Agriculture and Food Production. Future working sessions will concentrate on additional priority topics such as water and energy, and human health impacts of freshwater problems.

WORKING SESSION #3 OVERVIEW

Working Session #3, Examining U.S. Freshwater Systems and Services – Agriculture and Food Production, focused on identifying opportunities and potential solutions for addressing challenges at the intersection of freshwater and agriculture, including water quantity and water quality challenges and cross-cutting issues. The discussion was specifically focused on achieving the following objectives:

- **Define water resilience in the context of the agricultural and food production sector.**
- **Clarify our understanding of the challenges that exist at the intersection of US freshwater systems and agricultural practices.**
- **Identify priorities that need to be included in a national agenda for more resilient freshwater systems that also address our needs for food production.**

A diverse group of representatives from the agricultural sector convened around these objectives at the Wingspread Conference Center and engaged in a thoughtful exchange of opinions. Although perspectives varied on many points and the highlights and themes summarized here do not represent consensus outcomes, the group did identify several urgent needs, ripe opportunities and potential mutual benefits to be pursued in the freshwater-agriculture arena. The deliberations emphasized the following high-level themes:

- **Transformational change is necessary in order for the U.S. freshwater agriculture system to function at an optimal level and produce a reliable food supply while helping sustain an adequate supply of freshwater. The system of where and how our food is produced and what it costs may need to look very different than it does today in order to achieve a resilient system. Minor tweaks are unlikely to suffice.**
- **There are incremental steps that can serve as building blocks toward transformational change. Many opportunities exist to scale up successful approaches and models, and all sectors can and must play a role in moving toward transformational change.**
- **Effective solutions will require integrated approaches that cross traditional boundaries. Integration is needed between land use planning and water planning and across agencies, geopolitical lines, socio-economic regions, scientific departments and other artificial or cultural “silos.”**
- **Our legislative and regulatory tools, such as incentives in the Farm Bill, need to be aligned with national freshwater management goals.**
- **Water policy at the Federal and state level needs to find ways of harnessing and empowering local initiatives to address locally and regionally specific needs and opportunities.**
- **Water issues need to be more directly linked to public health, environmental and food security needs.**

These ideas and the detailed results of Working Session #3 will inform a framework for actionable steps that The Johnson Foundation can carry forward into future working sessions and the Summit. Additionally, this document is intended to serve as a tool for sharing the content and results of the discussions at Working Session #3 with others who did not have the opportunity to participate in this gathering and for moving the national dialogue forward on these critical issues. The meeting summary is organized into following sections:

- **Work Session #3 Overview**
- **Summary of Meeting Outcomes**
- **Challenges and Opportunities at the Intersection of Freshwater and Agriculture**
- **Building Blocks for Transformational Change**
- **Conclusions: Moving Forward**

The meeting program and list of participants are included in Attachments A and B, respectively.

SUMMARY OF MEETING OUTCOMES

In response to the objective of developing a working definition of a resilient freshwater agriculture system, the group focused on the defining functions of a resilient system. They took into account various elements of the system including governance, institutions, technology, agricultural practices, environmental impacts and ecosystem services. A resilient freshwater-agriculture system should:

- **Possess the capacity to adapt to an unpredictable and complex set of circumstances;**
- **Sustain the nation's ability to produce a reliable and secure food supply and contribute to other nations' ability to do the same;**

- **Protect and restore critical natural infrastructure such as wetlands, riparian buffers, and floodplains and sustain a drinkable, fishable and swimmable water supply;**
- **Support the provision of a wide range of ecosystem services that balance agricultural production and environmental conservation;**
- **Provide value to and support healthy, abundant and diverse ecosystems that sustain terrestrial and aquatic wildlife and their habitat;**
- **Account for the linkages between groundwater and surface water;**
- **Support the economic and cultural viability of rural agricultural communities; and**
- **Recognize that agricultural production and environmental outcomes can be compatible.**

The current freshwater-agriculture system is functioning at a sub-optimal level overall, in terms of sustainable use of freshwater supply and mitigation of water quality impacts. The system is facing a wide array of water quantity and quality challenges, with some more severe in certain parts of the nation than others. If the core element of a resilient system is the ability to withstand major disruption and adapt, then some components of the current system do not represent desirable baselines from which to measure resilience as they do not contribute to a status quo that should be maintained. From this process of grappling with the concept of freshwater resilience in the context of the agricultural system, emerged the following provocative questions:

- **Should the agricultural system focus only on supplying U.S. domestic needs, or be more fully integrated globally so as to optimize water use and food production?**
- **Should a resilient U.S. agricultural system look very different than our system does today? If so, what will be the driving force of change?**

Some in the group expressed a sense of urgency and suggested that for the U.S. to achieve freshwater resilience in the agricultural sector, the system would have to look very different than it does today. Due to the degree of change required and the sense of urgency, incremental change alone was seen by several as inadequate. Therefore, the group emphasized the need to strive toward transformational change as a first order aspirational goal for the nation. A key factor to catalyzing that transformational change will require stakeholders to look beyond current food production and water management systems to envision and define the goals of a resilient freshwater-agriculture system.

In order to move toward transformational change, the nation needs a vision of what it will look like and a roadmap for getting there. The following key elements could characterize a transformed freshwater-agriculture system:

- **Harmonization and integration of freshwater and agriculture governance structures;**
- **Innovative local initiatives expanded and/or replicated at regional or broader scales;**
- **A variety of decentralized, localized initiatives linked through a centralized accountability system that allows for sharing the risks inherent in change;**
- **The agricultural sector contributing to effective solutions as an integral part of a larger social movement focused on freshwater resources;**
- **Addressing agricultural production and/or environmental problems is a top priority among all stakeholders; and**
- **Successes involve and benefit multiple stakeholders.**

The group recognized that transformational change must emerge from the collective impact of many smaller-scale solutions and incremental changes, and focused on identifying solution options for setting the nation on a trajectory toward transformational change. Building blocks for transformational change include:

- **Data and science**
- **Governance and institutions**
- **Federal legislative action**
- **Financing and market forces**
- **Technology and technical assistance**
- **Dialogue, coalition building and networking**
- **Information sharing, education and messaging**
- **Equity and fairness**

Integration also emerged as a key theme during discussions throughout the work session, with participants noting several areas in which currently bifurcated policy, planning and management strategies are an impediment to transforming the ways freshwater is used in the U.S. agricultural system. Some participants noted that even the common dichotomy between water quantity and quality is an artificial one, and avoided compartmentalizing discussions during the meeting along that axis. Other typical dichotomies in need of integration include: urban and rural water policy and planning; land use planning and water management planning; surface water and groundwater management; regulation and economic incentives; and technical expertise and local place-based knowledge.

CHALLENGES AND OPPORTUNITIES AT THE INTERSECTION OF FRESHWATER AND AGRICULTURE

To initiate the deliberations, Reagan Waskom of Colorado State University, offered an opening presentation on the challenges and opportunities at the freshwater-agriculture intersection. The opening presentation and ensuing plenary discussion revealed the shared view that the U.S. is facing a range of significant and mounting freshwater supply and quality problems that may disrupt the nation's long-term food security. The opening presentation highlighted the range of freshwater challenges facing irrigated agriculture in the Western U.S. The presentation focused on issues arising in four scenarios including the Ogallala Aquifer (pumping for irrigation causing groundwater and stream flow depletion); the Imperial Valley of California (cost of on-farm efficiency conservation measures rising as farmers try to compensate for transfer of Colorado River allocations to cities), California's Central Valley (restrictions on Bay Delta pumping to protect endangered species), and the Front Range of Colorado (population boom sparking market-driven transfers of agricultural water to municipal uses). These examples demonstrated the severity of the water supply challenges in the West, many of which are applicable in other regions of the country as well. The status quo, if left unaltered, will pose increasingly acute food security, public health, economic and environmental risks.

Overarching Challenges

Building on the opening presentation, participants identified a diverse range of challenges associated with freshwater use and management in the U.S. agricultural sector. Overarching, high-level challenges that affect both water quantity and water quality include:

- **Incomplete and unreliable water data;**
- **Perceived lack of access to and implementation of new water conservation and efficiency technology;**
- **Artificial distinction between groundwater and surface water;**
- **The true price of water is not reflected in the cost to consumers;**
- **Lack of an integrated national legal framework for water rights;**

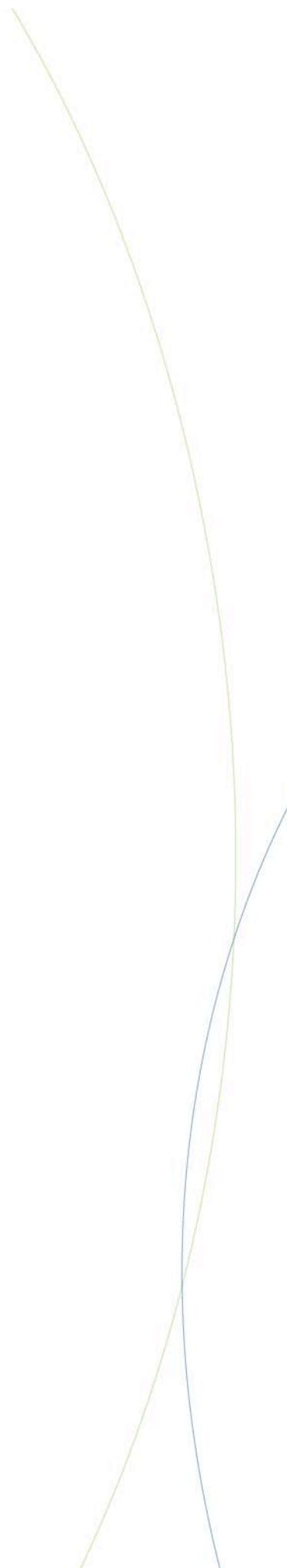
- **Inadequate (not robust) institutional frameworks;**
- **Lack of an integrated water management strategy for rural/agricultural and urban areas;**
- **Overlapping water management and regulatory jurisdictions;**
- **Political boundaries do not align with watershed boundaries;**
- **Interest and power of existing economic, political and market-based forces in maintaining the status quo; and**
- **Lack of political will on the issue.**

Additional priority challenges and opportunities were identified during subsequent discussions. For the purposes of organizing the following section, challenges and opportunities are summarized according to water quantity and quality. Specific solution options will be explained in greater detail in the Building Blocks section.

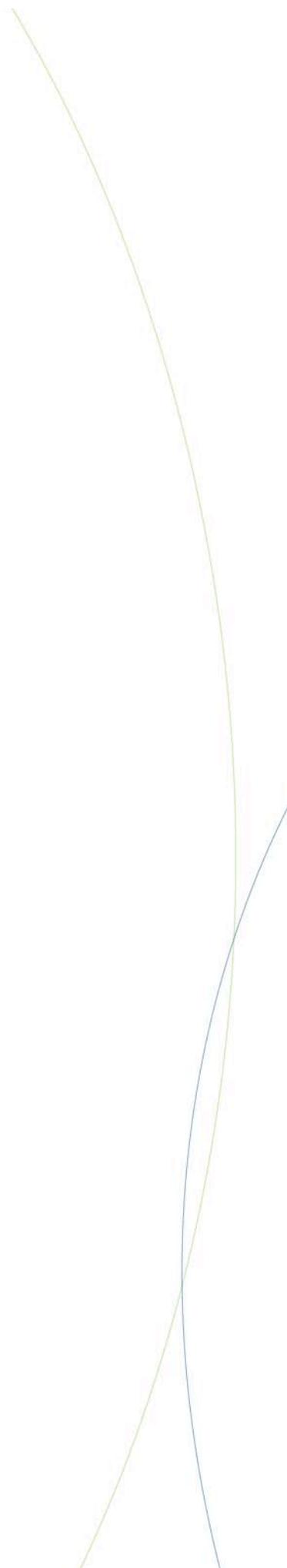
Water Quantity Challenges and Opportunities

QUANTITY CHALLENGE	OPPORTUNITY
Current water allocations (and overallocations) are based on outdated supply scenarios.	Establish more rational allocations based on updated water availability scenarios that reflect current conditions.
Better decision-making about and management of in-stream and return flows is needed	Involve stakeholders and/or independent peer review processes as part of planning to enhance ecosystem services
Broaden the definition of "beneficial use" in water law to include non-human uses.	Create flexibility to adapt water use to emerging needs such as ecosystem services and recreation.
Major gaps exist in data on water use (on farm practices, groundwater withdrawal rates, usage for different crops), and water availability (groundwater levels and recharge rates, snowpack levels, snowmelt rates), while the best monitoring technology is not being used widely.	Maintain and/or increase funding for monitoring programs, and build public private partnerships to support expanded and improved monitoring and data collection.
Selection of appropriate water efficiency, conservation or supply enhancement strategies depends on good data.	Data-driven selection of efficiency and conservation measures from a suite of available strategies to optimize impact (desalination, water re-use, groundwater banking, rainwater capture, flood water capture).
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QUANTITY CHALLENGE	OPPORTUNITY
Aging water supply and distribution infrastructure hinders understanding of water availability for agriculture.	Assess and upgrade infrastructure and update availability assumptions in the process; where possible, link upgrades to environmental benefits to create access to more funds.
There is a lack of political will to generate better data.	Build coalitions and partnerships to encourage and support collection and sharing of better data, especially site/basin-specific on-farm data.
Cost of investment in efficient irrigation technologies is prohibitive for many farmers.	Ramp up financial and technical assistance for implementation of water efficiency technologies to enhance onfarm conservation efforts and increase overall water supply.
The public has a negative perception of water re-use.	Better educate the public about the process and benefits of water re-use.
Link water supply management with urban growth management.	Create mechanisms for integrated planning to balance and meet urban and agricultural water supply needs, while protecting and enhancing existing rural economic and environmental values.
Recognize and account for links between water quantity and water quality challenges.	Anticipate and avoid unintended impacts of management decisions.
Need to manage and/or capture surplus flood waters in certain regions such as the Midwest.	Develop innovative management plans to balance storage and drainage needs (Iowa plan).
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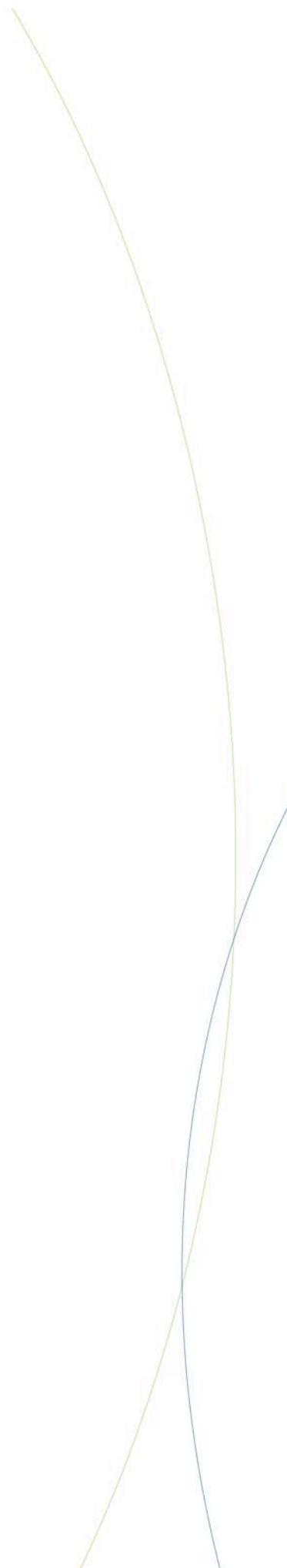


QUANTITY CHALLENGE	OPPORTUNITY
<p>Though pesticides are regulated under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), many agricultural activities are exempt from Clean Water Act regulations. Meanwhile implementation of existing Federal regulations by states has been ineffective and has not significantly reduced a wide array of non-point source pollutants and associated impacts (nutrients, sediment, pathogens, antibiotics and hormones, temperature, salinity).</p>	<p>Soften the point source and non-point source dichotomy, recognize legitimate agricultural point sources (confined animal feeding operations), and streamline and improve enforcement of existing Federal water quality regulations (nutrient management plans and numeric nutrient standards), while emphasizing those incentives as a means of meeting regulations. Explore innovative tools for achieving water quality goals including watershed permitting and water quality trading.</p>
<p>Cost of investment in new monitoring technologies and other on-farm technologies is hindering collection of adequate water quality data on point source and non-point source pollution in both surface waters and groundwater.</p>	<p>Ramp up financial and technical assistance for farmers to obtain new mitigation and monitoring technology and help collect baseline water quality data.</p>
<p>USDA conservation programs (e.g. EQIP) have not achieved widespread improvements in water quality because they are not adequately funded and funds are not targeted at the highest priority problem areas.</p>	<p>Adequately fund USDA programs (Farm Bill) and base award of conservation funds on potential environmental improvements and/or maximal number of agricultural participants in target watersheds with acute water quality problems rather than politics, and hold the agency accountable for environmental outcomes.</p>
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QUANTITY CHALLENGE	OPPORTUNITY
Approximately 50% of agricultural land in the U.S. is leased, making responsibility for environmental conservation unclear in many cases, which reduces the incentive for farmers to enact conservation measures and/or apply for conservation funds from USDA and other programs.	Landlords establish agreements with tenants regarding responsibility and permissions for environmental and water conservation measures.
There is a disconnect between the large number of actors involved in agricultural activities on individual plots of land and the downstream impacts they cause (ex. Gulf of Mexico dead zone).	Create incentives for farmers to coordinate on water quality management at the watershed scale by incorporating criteria into conservation programs (Federal and otherwise) that reward collaborative planning efforts.

While many freshwater quantity and quality challenges are threatening the stability of the U.S. freshwater-agricultural system, these challenges also create opportunities for creative problem solving and implementation of innovative solutions. Some of the key areas in which those opportunities exist include integrating traditionally bifurcated areas of water management, revamping existing conservation programs to enhance environmental outcomes, improving enforcement and compliance with existing water quality regulations, reconfiguring agricultural legislation to reward water conservation, modernizing aging infrastructure and scaling up successful water conservation and management strategies. The following section offers additional detail on ways in which the U.S. can seize opportunities for addressing challenges at the intersection of freshwater and agriculture.



BUILDING BLOCKS FOR TRANSFORMATIONAL CHANGE

While freshwater challenges are greater in some parts of the U.S. than others, the overall breadth and severity of the challenges facing the U.S. agricultural sector amount to a “freshwater crisis.” Decision makers and the public must be made aware of the potentially severe human, ecosystem and economic consequences of inaction. Fundamentally, there needs to be a greater, more widespread sense of urgency to act quickly and a louder collective voice calling for change. However, the nation is currently working with an ineffective and inadequate set of tools to fix the system, and lacks a vision for transforming the system and in a comprehensive way.

In an effort to create a foundation for tackling this major challenge, the potential solutions identified during the course of the work session are organized below into “building blocks.” The building blocks represent the major categories in which experimental actions and pilot projects can be implemented and scaled up to transform the freshwater agriculture system. The main building blocks identified by the group as key to catalyzing transformational change are:

- **Data and science**
- **Governance and institutions**
- **Federal legislative action**
- **Financing and market forces**
- **Technology and technical assistance**
- **Dialogue, coalition building and networking**
- **Information sharing, education and messaging**
- **Equity and fairness**

In the spirit of breaking down artificial barriers and sparking creative thinking, the solution options described within each building block cover both water quality and quantity challenges.

Data and Science – Data and monitoring systems for water use, availability and quality must be improved to inform better policy making and on-the-ground management decisions. Improved basin-specific monitoring and data collection would enable the targeting of problematic areas for conservation funding and appropriate selection of on farm water efficiency strategies and/or water quality mitigation practices. Requiring water use reporting and/or metering, and increasing funding for existing systems like the USGS stream gage monitoring program are other possible methods for producing better baseline data in the agricultural sector. The Russian River Data Server Project offers an interesting partnership model in which Microsoft Research is working with Lawrence Berkeley National Lab and the University of California to create a comprehensive “digital watershed” that integrates data from a number of sources into the Russian River scientific data server. This public-private partnership could serve as a useful model for improving the cataloguing, accessibility and utility of data for management decisions at the watershed scale.

Governance and Institutions – In the interest of long-term food security, public health and environmental conservation, the U.S. must assess and streamline the current system of governance for freshwater resources in the agricultural sector. Differences in Western and Eastern water law are likely to endure, but the nation would benefit from better alignment to reduce confusion and harmonize decision making on who has rights to what water supplies. More interagency coordination at all scales is required to simplify and leverage existing policies and regulations for greater overall effectiveness.

At the Federal level, improved coordination between USDA and EPA would be helpful. For example, USDA and EPA could harmonize requirements for EQIP funding and Section 319 water quality grants. USDA conservation programs should undergo a thorough assessment to determine which tools are working and which are not, and cut back or eliminate ineffective programs. U.S. EPA should exercise its existing authority under the Clean Water Act more proactively to motivate states to develop their mandatory nutrient management plans and numeric nutrient standards. U.S. Army Corps of Engineers must also coordinate as aging infrastructure is addressed, along with the U.S. Fish & Wildlife Service which is likely to play a growing role as it applies stipulations of the Endangered Species Act in river basin supply (in-stream flow) and quality decisions.

In addition to coordination among Federal and state authorities, new mechanisms and incentives should be developed to encourage coordination, information sharing and application of local authority among local management districts (conservation, flood management, drainage) to drive conservation. It may be possible to hire local districts as water managers using EQIP funds. Water management districts in California, such as the Tehama County Flood Control and Water Conservation District in the Sacramento Valley, offer models of how local district managers can apply their authority to establish watershed-scale management plans. This district used its authorized powers to go beyond its traditional flood control role and develop the first local coordinated groundwater management plan in California in the early 1990s.

Water quantity and quality management need to be integrated in a variety of different ways. Conjunctive management is an emerging strategy for the coordinated management of groundwater and surface water that is gaining momentum in places like California. Public officials, academics and other experts must find ways to effectively link land use planning and water use planning. Lastly, urban municipal water needs and rural agricultural water needs within certain states or geographic regions must be examined in conjunction as well to avoid unforeseen adverse impacts of unabated rural-to-urban water transfers. It is possible that in a reformed institutional setting, improving agricultural water use efficiency could save water that could then be “shared” for ecosystem services and municipal use, while maintaining the economic viability of rural agricultural areas. Conversely, increasing water use efficiency and conservation in urban areas, including improved stormwater management through low impact development measures, could alleviate some of the pressure on western agricultural users. A September 2009 conference of the Western States Water Council of the Western Governors’ Association focused specifically on growth management and water supply, highlighting the importance of linking the two.

Federal Legislative Action – There are a few key legislative actions that could spark significant changes in the freshwater-agriculture system. The Farm Bill is the key piece of legislation that creates the framework for agricultural production and associated water use in the U.S. agricultural sector, as well as providing funding for USDA conservation programs. The current structure of Farm Bill crop subsidies encourages producers to maximize the productivity of their lands, effectively acting as a deterrent to water conservation. The subsidies also potentially distort crop choices in such a way that water availability and water quantity considerations are deemphasized and therefore result in imbalanced regional water budgets. For example, subsidies may encourage decisions to farm cotton or raise dairy cattle, both water-intensive activities, in arid areas.

Agricultural producers generally favor economic incentives for action rather than regulation so balancing the two factors in an acceptable way is critical. Altering the Farm Bill to link conservation requirements to crop subsidies, especially nutrient control measures, may create an incentive for farmers to conserve their lands and water resources. Now defunct, the conservation compliance provision from the 1985 Farm Bill, required implementation of erosion management measures on vulnerable lands for producers to retain subsidies and successfully addressed erosion issues on a broad scale. This provision offers an example in which the balance between regulation and incentive was met successfully, and resulted in positive environmental outcomes. Similar “carrots with strings” stipulations geared toward water efficiency/conservation and nutrient control actions could be incorporated into future Farm Bills. This same approach could also be incorporated into state and local-level conservation programs.

Legislators must also adequately fund USDA conservation programs like EQIP through the Farm Bill, and possibly by shifting funds from other areas toward conservation efforts. In addition, conservation programs should be reconfigured to target acute problem areas (major nutrient loading) to maximize environmental outcomes. Congress should consider allowing prioritization of funding awards to farmers and stakeholders that work together to identify priority problem areas and priority mitigation strategies. Such an approach might be implemented through the Agricultural Water Enhancement Program. In addition, funds for conservation programs should be allowed to carry over from year to year and USDA should be held accountable for achieving environmental outcomes through its conservation programs.

Financing and Market Forces – Participants generally agreed that economic incentives are a good strategy to motivate producers to implement water quantity and quality best practices. Beyond USDA and EPA programs there are not many sources of funding to finance such incentives. There may be opportunities to engage Wall Street in underwriting loan guarantee programs or revolving loans to support conservation. Market-based, consumer or retailer-driven, incentives could be another effective strategy to encourage producers to practice conservation (go green).

Technology and Technical Assistance – Along with incentives to encourage use of different kinds of agricultural practices and conservation methods, the nation also needs to provide financial and technical assistance to help farmers handle up-front costs and implementation challenges of new technology such as higher efficiency irrigation systems. Technical assistance from governmental agencies, non-governmental organizations, and/or private entities is an important service that should be adequately supported and encouraged across the nation. These entities can be helpful to producers for things like developing efficient watering schedules, establishing integrated pest management systems, and instituting adaptive management approaches. Bio-technology and bioengineering are areas that should be carefully examined for their potential contribution to freshwater conservation. Developing and growing more water-efficient crops could have a significant impact on agricultural water use.

Dialogue, Coalition Building and Networking – Seizing opportunities to address several of the major quantity and quality challenges facing the freshwater-agriculture system will require collaboration between different interest groups. Creating forums for dialogue about topics such as integrated management approaches, water sharing, data collection and sharing, water re-use, and water transfers could help generate creative multi-party solutions. Building coalitions to promote action around specific challenges such as improved data collection and monitoring on private lands could help generate political will. Coordinated coalitions or partnerships could also lead to “better politics” so that opportunities for legislative action are not missed. Another potential outcome of dialogue, coalition building and networking is the identification of successful approaches, models, pilot projects and lessons learned that can be applied and/or scaled up around the nation. For example, participants noted a few forthcoming reports likely to contain useful examples and lessons including a report on the Great Lakes Basin Compact, a possible model for integrated cross-jurisdictional water management from the Klamath Basin, and new reports from the NRCS Conservation Effects Assessment Project.

Information Sharing, Education and Messaging – Information sharing, education and effective messaging are critical to generating a sense of urgency and motivating action among agricultural political leaders, the public and producers to address the freshwater crisis facing the U.S. agricultural system. The public needs to be better educated on the true value of water and conservation options like water re-use, as well as the significant issues facing agriculture and freshwater and the solutions to these challenges. Public messaging on the growing freshwater-agriculture crisis requires a hook to raise the sense of urgency. The *status quo* is not viable, and tying that fact to key concerns like a reliable food supply, national security and/or public health may be an effective strategy. An effective messaging campaign requires sustained attention in policy arenas and the media. In addition to publicizing the nature of the problem, the media should also cover success stories to illustrate strategies that work and convey a sense that transformational change is attainable.

Engaging agricultural producers as problem solvers and co-generators of knowledge about how to address water quantity and quality challenges is crucial. For example, agencies could convene farmers to provide input on what types of conservation incentives would be most attractive, and on how to balance incentives and regulation in an acceptable way. Farmers, particularly irrigators, could also participate in the messaging campaigns, serving as messengers about the true value of freshwater resources to urban populations.

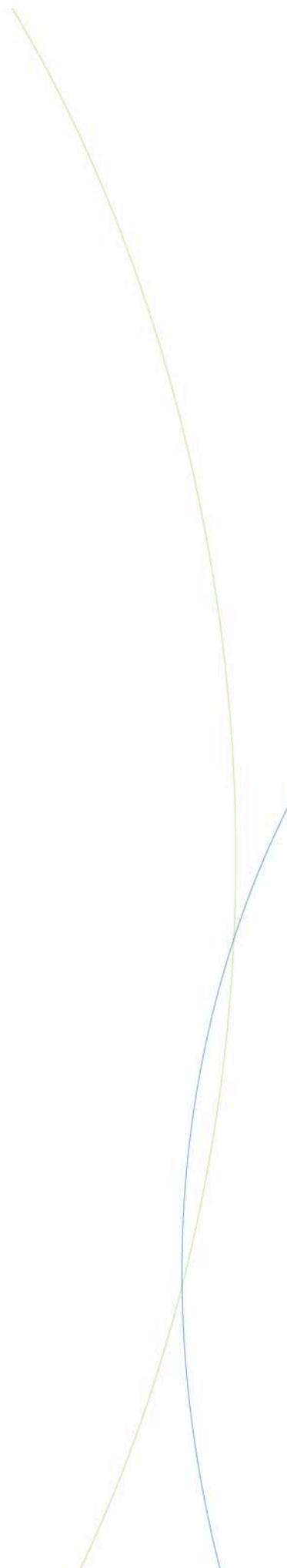
Equity and Fairness – In working toward transformational change and a resilient freshwater-agriculture system, one must consider equity and fairness issues. The interests and needs of multiple sectors, including future generations, must be considered as solutions are developed. Solutions should seek to benefit multiple stakeholders, and avoid providing benefits for one group, place or region at the expense of another.

Furthermore, a resilient freshwater-agriculture system may involve added costs. New on farm technologies and systems will require additional up-front investment and potentially greater maintenance costs. If priced to reflect the real costs of production in this more resilient system, food also is likely to cost more at the grocery store. If this is the case, it will be necessary to mitigate the impacts of rising food costs on the people who can least afford them. At the same time, changing the U.S.'s agricultural paradigm could have widespread beneficial impacts on human health and bring down national health care costs.

CONCLUSIONS: MOVING FORWARD

These building blocks, and the potential solutions described for each, provide a sense of the possibilities that exist for addressing water quantity and quality challenges at the freshwater-agriculture intersection. To transform the current sub-optimal system and ensure the resilience of our agriculture and freshwater systems, the nation must take action and implement experimental ideas and pilot projects to determine what works, and scale up successful approaches to a level that transforms the freshwater-agriculture system.

The session concluded with an exploration of ideas about initiatives within the different building blocks (new or ongoing) that The Johnson Foundation could potentially support to catalyze movement toward transformational change. To be truly transformative, any initiative must involve contributions from all relevant stakeholders, and actions must be coordinated across scales and executed with an adaptive management approach to allow for adjustments and enhanced effectiveness over time.



Attachment A: Meeting Program

The Johnson Foundation at Wingspread Environmental Forum Working Session #3 *Examining U.S. Freshwater Systems and Services – Agriculture and Food Production*

September 1–3, 2009

Background readings will be posted on the Johnson Foundation website at www.johnsonfdn.org/upcoming.html.

OBJECTIVES

- Define water resilience in the context of the agricultural and food production sector.
- Clarify our understanding of the challenges that exist at the intersection of US freshwater systems and agricultural practices.
- Identify priorities that need to be included in a national agenda for more resilient freshwater systems that also address our needs for food production.

OUTCOMES

- Recommendations for a national agenda for more resilient freshwater systems that also ensures food security.
- Topics to consider for future work sessions.
- Topics for consider for the 2010 Johnson Foundation Environmental Summit.

TUESDAY, SEPTEMBER 1, 2009

Guests arrive Tuesday. Check in at the Guest House.

12:00 – 2:00 p.m. **Buffet Luncheon/Guest House**
Guests should feel free to tour the grounds.

3:30 p.m. **Gathering/Guest House**

4:00 p.m. **Plenary Session/The House**
Welcome to Wingspread

Roger Dower, President

Lynn Broaddus, Director, Environment Programs

The Johnson Foundation at Wingspread

4:15 p.m. **Conference Goals, Agenda Review and Introductions**

John Ehrmann, Facilitator,
Meridian Institute

4:30 p.m.

Overview Presentation

Overview of opportunities and challenges at the intersection of agriculture and freshwater in a water-limited environment.

Reagan Waskom, Colorado Water Institute,
Colorado State University.

Presentation followed by group discussion.

4:50 p.m.

Plenary Discussion: Freshwater Resilience in the Agriculture Sector

What does it mean to achieve freshwater resilience in the agriculture sector? What are the priority issues that need to be addressed in the agriculture sector so that our freshwater resources will be more resilient?

Outcome: Preliminary list of priority challenges for further discussion later in the agenda.

6:00 p.m.

Day 1 Wrap-up

Brief highlights of Day 1.
Suggested organization of priority topics for Day 2 discussion.

6:15 p.m.

Adjourn Day 1

6:30 p.m.

Hospitality/Wingspread

7:00 p.m. Dinner/Wingspread

8:30 p.m. Adjourn to Guest House for hospitality/
Guest House

WEDNESDAY, SEPTEMBER 2, 2009

Breakfast will be available from 6:30 a.m. to 8:15 a.m. in the living room of the Guest House.

The agenda for Day 2 will be refined based on the results of Day 1.

8:30 a.m. Plenary Session/The House

Welcome and review of the agenda for the day.

John Ehrmann, Meridian Institute

8:45 a.m. Plenary Discussion: Priority Themes –
Water Quality

Using the ideas generated from the Day 1 conversation, the framing document and introductory presentation as background, the group will discuss priority challenges with respect to water quality and agriculture.

10:15 a.m. Break

10:30 a.m. **Plenary Discussion: Priority Themes –
Water Quantity**

Using the ideas generated from the Day 1 conversation, the framing document and introductory presentation as background, the group will discuss priority challenges with respect to water quantity and agriculture.

12:00 p.m. **Luncheon/The House**

12:30 p.m. **Breakout sessions**

Two groups will be created – one to focus on water quality and one to focus on water quantity.

Task: Identify the top strategies/opportunities for improving the health of our freshwater systems without compromising providing food supply.

- **Highest priorities**
- **Challenges to scaling up
the opportunities**
- **Strategies to overcome barriers**

2:45 p.m. **Break**

3:00 p.m. **Plenary Discussion: Breakout Session Results**

Reports back to the group followed by discussion.

4:00 p.m. **Plenary Discussion: Synthesis of Cross-Cutting Themes**

Discuss the integration of opportunities and goals for agricultural systems and practices that support more resilient freshwater resources.

5:00 p.m. **Plenary Discussion: Freshwater Resilience and Agriculture**

Return to discussion of what it means to achieve freshwater resilience in the agricultural sector.

5:45 p.m. **Day 2 Wrap-up**

Brief highlights of Day 2 and discussion of priority topics for Day 3 discussion.

6:00 p.m. **Adjourn Day 2**

6:30 p.m. **Hospitality and tour of Wingspread/Wingspread**

7:00 p.m. **Dinner/Wingspread**

8:00 p.m. **Hospitality/Guest House**

THURSDAY, SEPTEMBER 3, 2009

Breakfast will be available from 6:30 a.m. to 8:15 a.m. in the living room of the Guest House.

The agenda for Day 3 will be refined based on the results of Day 2.

8:30 a.m. **Plenary Session/The House**
Welcome and review of the agenda
for the day.

John Ehrmann, Meridian Institute

8:45 a.m. **Plenary Discussion: Top priorities for**
Food Security and Resilient Freshwater
Services

Facilitated group discussion: Where are the gaps, barriers and most pressing needs that can be addressed to advance more resilient freshwater systems and sustainable agricultural practices?

Synthesis of priorities for The Johnson Foundation and a national agenda for addressing freshwater challenges in the US.

10:30 a.m. **Break**

10:45 a.m. Plenary Discussion: Next Steps

Facilitated group discussion: What are the key topics that can be addressed in future Wingspread Work Sessions or the 2010 Environmental Meeting? Who are the key people that need to be involved to make the events successful?

11:15 a.m. Wrap-up and Final Round of Comments

John Ehrmann, Meridian Institute

12:00 p.m. Conference adjourns

12:00 p.m. Luncheon/Guest House

Transportation departs from the Guest House. Box lunches will be available for those who are not able to stay for our final meal.

Attachment B: List of Participants

Sandra S. Batie

Elton R. Smith Professor
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Food and Resource Economics
Michigan State University

Juliet Christian-Smith

Senior Research Associate
Pacific Institute
Oakland, CA

Craig A. Cox

Vice President
The Environmental Working Group
Ames, IA

Joseph J. Dulka

Research Fellow and Global Regulatory
Ecotoxicologist
DuPont Crop Protection Products
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Richard M. Frank

Executive Director
Center for Law, Energy and the Environment
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Elisabeth A. Graffy

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Middleton, WI

David Brakhage

Director of Conservation Programs
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Ann Arbor, MI

Hannah M. Connor

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Waterkeeper Alliance
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James N. Daukas

Managing Director
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American Farmland Trust
Washington, DC

Molly M. Flanagan

Program Officer
Environment Program
The Joyce Foundation
Chicago, IL

Richard W. Glass

Vice President
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National Corn Growers Association
Chesterfield, MO

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Agricultural Policy Director
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John Matthews

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Stakeholder
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Joel Lipsitch

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Program Officer
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