SETTING CONDITIONS FOR THE SUCCESS OF INTEGRATED WATER RESOURCES MANAGEMENT
FEATURE ARTICLES

8 Legislation Supporting IWRM in Nebraska
Fifteen years after the state Legislature passed the Nebraska Ground Water Management and Protection Act, a network of plans now stretch to all corners of the state.
Carol Myers Fiaute, Sarah Nevison, Jennifer Schellpeper

12 Transitioning to Integrated Water Resources Management in California
California's statewide IWRM program is helping manage the transition to widespread practice of IWRM. Fifteen years since it was instituted, there are many successes, and today the program faces challenges.
Mike Antos

16 Weaving Education and Outreach into Your Projects: An Integral Part of Creating Success
The Riley Purgatory Bluff Creek Watershed District learned hard lessons about engaging community. Now engagement is fundamental to how the district undertakes its mission and its projects.
Michelle Jordan, Claire Bleser

19 Boundary Spanning – How Far Can It Reach?
Having IWRM teams include someone who can connect disparate perspectives, build trust, and ensure clear communication is of critical importance. These key participants are called boundary-spanners.
Jodi Delucie

21 Making IWRM Fun – Using Serious Gaming to Facilitate the IWRM Process
Over recent years, serious games have been applied more and more to helping water resources stakeholders understand the tradeoffs, risks, and benefits related to their water resources.
Jennifer M. Olaszewski, Hunter Merritt, Andrea Carson, John Kurcharski, Hol Caldwell

23 A Conceptual Model for Developing and Implementing IWRM
The IWRM goal of improving the understanding, management, and governance of water resources benefits from a properly designed conceptual model that can be understood by all participants.
Gerald Seltke

OTHER FEATURES

Messages
7 President's Message
Lisa Beutler, AWRA President

Columns
26 What's Up With Water: What If We Can't Wait to Respond to Changes in Water and Coastal Resources Due to Climate Change?
28 Guest Column: Water Resources Planning as a Key Component of the Southeastern Wisconsin Regional Plan
32 Book Review of GIS for Surface Water: Using the National Hydrography Dataset by Jeff Simley

AWRA Business
33 AWRA State Section and Student Chapter News
37 Technical Committee Updates
38 April AWRA Highlights
40 Upcoming AWRA Conferences

About this issue
Issue Theme: Setting Conditions for the Success of Integrated Water Resources Management
Guest Editors: Amy Zoller and Mike Antos
Integrated Water Resources Management (IWRM) principles support the sustainable management of water through collaboration, science, and community-based planning and implementation. At its best, IWRM applies knowledge from various disciplines and diverse stakeholders to devise and implement equitable and sustainable solutions to water-related issues.
Many IWRM successes result from inspired and inspiring efforts to overcome institutional, financial, social, and physical barriers. Elsewhere, specific efforts to set the conditions for success are undertaken by legislators, decision-makers, and communities, easing the effort to apply IWRM principles to water management challenges. Achieving sustainable management of water demands IWRM principles be made part of the everyday practice of professionals, agencies, and decision-makers.
In the following pages are three stories in which a change in the policies, budgets, authorities, laws, or governance structures allowed IWRM principles to flourish, and three insights that can ensure the success of IWRM when it is undertaken—at the policy or programmatic level.
Since 2004, Nebraska has made considerable progress with integrated management planning; this article highlights key legislative elements in a framework to support the success of this aspect of integrated water resources management (IWRM). State and local water management agencies jointly develop Nebraska’s integrated management plans and basin-wide plans, which seek to achieve a balance between water uses and supplies while managing hydrologically connected surface water and groundwater as an interconnected resource.

These plans are developed and implemented collaboratively by the Nebraska Department of Natural Resources (Department), which regulates and manages surface water statewide, and 23 local Natural Resources Districts (Districts), which regulate and manage groundwater. The Districts, which are organized along river basin boundaries and governed by locally elected boards, were created by the Nebraska Legislature in 1972. This decentralized institutional framework ensures a focus on local challenges and opportunities, but also raises the question: How can a group of principals who consume a commonly owned resource, like water, “organize and govern themselves to obtain continuing joint benefits when all face temptations to freeride, shirk, or otherwise act opportunistically” and not overuse the resource? This was the basic research question addressed by Elinor Ostrom in her book *Governing the Commons*. While Ostrom’s principles are not discussed specifically in this article, many of the legislative tools that have made IWRM in Nebraska successful follow her design principles.

**Legislative Toolbox**

The Nebraska Ground Water Management and Protection Act and other statutes provide the Department and Districts with authorities, tools, and guidance supporting IWRM. In 2004, the legislature adopted language directing the Department to determine which areas to designate as fully or overappropriated for surface water and hydrologically connected groundwater. Integrated management plans are required in fully appropriated areas, and both integrated management plans and a basin-wide plan are required in overappropriated areas. The legislation also listed required components and processes for each type of plan. In 2010, the legislature authorized Districts in the rest of the state to develop voluntary integrated management plans with
the Department. In 2014, another law required basin-wide plans in some fully appropriated areas.

These statutes provide a toolbox of requirements, options, and incentives that support IWRM. Requiring plans in water-challenged areas directs efforts where most needed, whereas authorizing voluntary planning in other areas encourages proactive water management. Requiring collaboration between state-level surface water managers and local groundwater managers to develop and implement these plans promotes improved cooperation, communication, and data sharing. Statutes also specify a dispute resolution procedure in case disagreements arise. Monitoring plan implementation is also required, resulting in an adaptive approach to resource management, as the District and Department can decide together to modify a plan based on their evaluation of progress toward goals (Figure 1). Together, these statutes have provided tools for proactive water management across the state. Described below are two other important ways state laws support IWRM in Nebraska: stakeholder participation and funding sources.

**Stakeholders Are Key**

Stakeholder participation is a key component of integrated management plan and basin-wide plan development. When developing voluntary integrated management plans and those required in fully appropriated areas, the Department and Districts must consult with stakeholders who rely on water from the affected area. Stakeholders are even more involved with developing integrated management plans in overappropriated areas and required basin-wide plans, as statute requires the Department and Districts to consult and collaborate with stakeholders for these types of plans and work to reach agreement among all parties involved. These stakeholders help formulate, evaluate, and recommend goals, objectives, and management actions (Figure 2).

In addition to outlining the role of stakeholders, statute specifies interest groups that must be invited to participate as stakeholders. These include irrigation, reclamation, and public power districts; mutual irrigation or canal companies; and municipalities that rely on water

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from the basin. The Department or the Districts may also choose to include other stakeholder interests, such as non-governmental organizations or other water users. For some types of plans, groundwater users, range livestock owners, and the Nebraska Game and Parks Commission are also included as required invitees. Stakeholders provide valuable local insight into the unique water management concerns and opportunities of each area from the perspective of the water interests they represent (Figure 3).

Having stakeholders involved in the process has also improved relations among the state’s water users. Prior to the adoption of the first integrated management planning statutes in 2004, there was limited recourse within Nebraska law to address conflicts between surface water and groundwater users other than through the courts. Participating as stakeholders for plan development provides the opportunity to sit at the table together, learn from one another, and help shape a plan that will address conflicts over time as the plan is implemented.

**Funding Opportunities**

State law authorizes several funding sources that support IWRM projects. The Legislature appropriates money for the Department to carry out the Ground Water Management and Protection Act, which it uses to enhance data collection and analysis tools and to partner with the Districts on plan development and implementation. The Districts may levy property taxes to support water management, and if they have adopted an integrated management plan containing certain language, they can also issue

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**Figure 3.** Stakeholder participation in plan development is required. Each plan benefits from the interaction of stakeholders’ valuable local insight with the Department (NeDNR) and Districts’ (NRDs) expertise in water management.

**Figure 4.** All 23 Natural Resources Districts (Districts) are now involved with the Department in some stage of development or implementation of an integrated management plan. Statute requires plans in areas designated as fully or overappropriated and allows plans in other areas.
bonds or collect an occupation tax on irrigated land to support IWRM.

Nebraska’s Water Sustainability Fund is available statewide to a variety of organizations; for the Districts to be eligible, they must be developing or implementing an integrated management plan with the Department, which has provided strong incentive to initiate voluntary integrated management plans. In fully or overappropriated areas, an additional source for projects that reduce consumptive use or enhance streamflows or groundwater recharge is the state’s Water Resources Cash Fund. Together, these funding sources are essential for sustaining IWRM in Nebraska.

**IWRM in Action**

Fifteen years after the passage of Nebraska’s first integrated management planning statute, a network of plans now stretches to all corners of the state. All 23 Districts are involved with the Department in some phase of development or implementation of an integrated management plan (Figure 4), and there are three basin-wide plans (Figure 5). Layering statutory requirements for both types of plans in the same geographic areas encourages consideration of both local and regional water issues and opportunities. For example, the basin-wide plan for the Upper Platte River Basin lays out a framework of goals and objectives that generally define what the Districts and Department want to achieve and create opportunities for collaboration, whereas the individual integrated management plans within the basin set local targets and actions to meet the basin-wide plan’s goals and objectives, taking into account each district’s own priorities, opportunities, and constraints.

Nebraska’s integrated management plans and basin-wide plans have improved collaborative water management throughout the state. They have facilitated inter-agency IWRM projects, such as using surface water canals to capture flood flows for aquifer recharge. They have helped the Department and Districts determine together where regulatory controls are needed. They have enabled the Department and Districts to identify data needs and enhanced information sharing among agencies. These plans have also helped coordinate efforts to meet the State’s obligations under interstate water agreements. Nebraska’s legislation supporting IWRM has made these successes and others possible.

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