Density of Active Registered Irrigation Wells - December 2015

Wells / sq. mile
- 0 - 1
- 1 - 2
- 2 - 4
- >16

Surface water
Sandhills

CONSERVATION AND SURVEY DIVISION (http://sar.unl.edu/csd)
School of Natural Resources (http://sar.unl.edu)
Institute of Agriculture and Natural Resources
University of Nebraska-Lincoln

Aaron Young, Survey Geologist, CSD
Mark Burbach, Water Levels Program Supervisor, CSD
Les Howard, GIS Manager, CSD

Source: Nebraska Department of Natural Resources

December 2015
### Area-weighted Average Water Level Change Predevelopment to 2013

<table>
<thead>
<tr>
<th>State</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorado</td>
<td>-14.3</td>
</tr>
<tr>
<td>Kansas</td>
<td>-25.5</td>
</tr>
<tr>
<td><strong>Nebraska</strong></td>
<td>-0.3</td>
</tr>
<tr>
<td>New Mexico</td>
<td>-16.5</td>
</tr>
<tr>
<td>Oklahoma</td>
<td>-12.3</td>
</tr>
<tr>
<td>South Dakota</td>
<td>1.8</td>
</tr>
<tr>
<td>Texas</td>
<td>-41.2</td>
</tr>
<tr>
<td>Wyoming</td>
<td>-0.8</td>
</tr>
<tr>
<td><strong>High Plains</strong></td>
<td><strong>-15.4</strong></td>
</tr>
</tbody>
</table>
Surface Water
Prior Appropriation
1895
Effective Management of Hydrologically Connected Waters

Groundwater Correlative Rights
Groundwater Regulated by NRDs
Surface Water Prior Appropriations
Surface Water Regulated by DNR
Map: Areas Involved in Integrated Water Management Planning as of June 2015

Legend:
- IMP Not Present
- Required, Approved IMP Area
- Voluntary, Approved IMP Area
- Voluntary IMP Area (In Development, Area Defined)
- Voluntary IMP Area (In Development, Area Not Defined)

Map regions:
- Upper Niobrara-White
- North Platte
- South Platte
- Twin Platte
- Upper Republican
- Middle Republican
- Tri-Basin
- Central Platte
- Lower Republican
- Lower Loup
- Upper Elkhorn
- Lower Elkhorn
- Lower Platte North
- Lower Platte South
- Lewis & Clark
- Papio-Missouri River

Source: Nebraska Department of Natural Resources
Groundwater-Level Changes in Nebraska - Spring 2005 to Spring 2015

CONSERVATION AND SURVEY DIVISION (http://sur.unl.edu/csd)
School of Natural Resources (http://snr.unl.edu)
Institute of Agriculture and Natural Resources
University of Nebraska-Lincoln
Aaron Young, Survey Geologist, CSD
Mark Burbach, Water Levels Program Supervisor, CSD
Les Howard, GIS Manager, CSD

U.S. Geological Survey
Nebraska Water Science Center
U.S. Bureau of Reclamation
Kansas-Nebraska Area Office
Nebraska Natural Resources Districts
Central Nebraska Public Power and Irrigation District

School of Natural Resources
Institute of Agriculture and Natural Resources
University of Nebraska-Lincoln
The University of Nebraska-Lincoln does not discriminate based on gender, age, disability, race, color, religion, marital status, veteran’s status, national or ethnic origin, or sexual orientation.

December 2015
Nebraska’s Natural Resources Districts

An Assessment of a Large-Scale Locally Controlled Water Governance Framework

By Ann Bleed and Christina Hoffman Babbitt

Governing the Commons  1990
<table>
<thead>
<tr>
<th>Determined by State Law</th>
<th>Partially Determined by State Law Implemented by DNR and NRDs</th>
<th>Encouraged by Emphasis on Local Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ Recognition of Right to Organize Locally</td>
<td>✓ Rules to Prevent Overharvesting</td>
<td>• Trust</td>
</tr>
<tr>
<td>✓ River Basin Approach</td>
<td>✓ Congruence Between Rules and Local Conditions (NRDs)</td>
<td>• Leadership</td>
</tr>
<tr>
<td>✓ Clearly Defined Boundaries</td>
<td>✓ Graduated Sanctions</td>
<td></td>
</tr>
<tr>
<td>o Nested Enterprise</td>
<td>✓ Monitoring</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Adequate Funding</td>
<td></td>
</tr>
<tr>
<td></td>
<td>✓ Adaptive Management</td>
<td></td>
</tr>
<tr>
<td></td>
<td>✓ Effective Communication</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Collective Choice Arrangements/Collaboration</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Equity and Procedural Fairness</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Secure Tenure Rights</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Rapid Access to Conflict Resolution Mechanisms</td>
<td></td>
</tr>
</tbody>
</table>
TO COPE WITH CLIMATE CHANGE

✓ Transcend artificial political boundaries
✓ Match governance system to issues and scales appropriate to problem
✓ Facilitate multiple actors
✓ Provide adequate public participation to add legitimacy, increase understanding, promote trust
✓ Adaptive Management
  Allow for experimentation in a way that diversifies risk
  Allow flexibility to adapt to changing conditions
PROBLEM AREAS

Equity

Rapid access to conflict resolution processes

Nested enterprise
“Although the integrated management law is a step toward reducing future conflicts through general regulation, ideally, the Legislature would develop a more comprehensive administrative appropriation system, including procedures and remedies, to adjudicate direct conflicts between groundwater and surface water users in Nebraska”
NESTED HIERARCHY

Local institutions are part of a larger integrated network with different hierarchies and scales that collaborate with each other to manage the resource.
The Legislature intends and expects that each natural resources district within which water use is causing external impacts will accept responsibility for ground water management ... in the same manner and to the same extent as if the impacts were contained within that district;

Neb. Rev. Stat §46-703
Because local entities are under intense pressure from local entitlement holders, it is difficult for them to restrict water rights without support from higher level institutions.

NESTED HIERARCHY

Elinor Ostrom
The NRDs do not always agree and there are times when the State should be an arbitrator between NRDs.

There is a need for overall guidance from the State where impacts extend beyond NRD boundaries and where there are issues related to the sustainability of the water supply.
The State should provide a statewide perspective, set a common target and unified expectation of outcomes across watershed, and then give the NRDs the opportunity to carry out the necessary duties.

However, if the NRDs do not meet the targets, the State should have the regulatory power to step in to ensure the targets and the interests of the State are met.
NEBRASKA’S NRD GOVERNANCE SYSTEM BASED ON LOCAL CONTROL

- Allows rules to be at appropriate scale and be flexible and adapted to local conditions
- Allows more people affected by the rules to make the rules
  - More acceptable
  - More likely to be followed without the need for enforcement
- Encourages initiative and creativity
- Increases communication
- Encourages the Development of Leaders
- Generates trust
The will of the people themselves to communicate and collaborate with all stakeholders, to work to develop trust, and to provide the leadership necessary to ensure that the intent of the laws is in fact realized.