University of Nebraska - Lincoln
DigitalCommons@University of Nebraska - Lincoln

John Owens: Speeches & Appearances

Agriculture and Natural Resources, Institute of (IANR)

1-1-2005

Ag at the Crossroads

John Owens
University of Nebraska - Lincoln, jowens2@unl.edu

Follow this and additional works at: http://digitalcommons.unl.edu/owenspeech

Part of the Agriculture Commons

Owens, John, "Ag at the Crossroads" (2005). *John Owens: Speeches & Appearances.* Paper 159.
http://digitalcommons.unl.edu/owenspeech/159

This Article is brought to you for free and open access by the Agriculture and Natural Resources, Institute of (IANR) at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in John Owens: Speeches & Appearances by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

AG AT THE CROSSROADS

East Campus Union
November 3, 2005
John C. Owens
NU Vice President and IANR Harlan Vice Chancellor,
and
Kyle Hoagland, Water Center Director

Good afternoon. It is always a pleasure to take part in Ag at the Crossroads. I am particularly pleased today to be asked to talk about one of our Institute of Agriculture and Natural Resources' strategic plan priorities, and that is water. One of our four strategic plan priority goals is to, "Develop an integrated, multi-disciplinary, multi-functional water resources program addressing Nebraska's needs that provides statewide, national, and international leadership in water quality and quantity management in the next decade."

A second of our priority goals is to, "Enhance rural economic opportunity and community revitalization efforts to create more opportunities for future generations, improve the quality of life, and to attract talented and educated people to build their lives in Nebraska."

In many ways the importance of water and community revitalization go hand in hand, because of the importance of water in all our lives. Both these strategic plan priorities – water, and rural economic opportunity and community revitalization – directly respond to concerns we in the Institute heard when we conducted over 30 listening sessions across Nebraska in 2003, and when we did a smaller number of listening sessions in 2004. In every community we visited, from west to east and north to south in our state, rural economic opportunity and water – both water quality and quantity – were concerns.

Dr. Kyle Hoagland, Director of our Water Center and one of the leaders of our University of Nebraska-Lincoln Water Resources Research Initiative, recently updated the Board of Regents on water research and education occurring at the university, as well as our goals, issues, and vision for the future. I thought his presentation so appropriate for today's topic that I asked Dr. Hoagland if he would come and join me by being part of our discussion today. He graciously agreed, so I am going to

ask him to come forward now, and then I will offer a few concluding remarks after he speaks. Dr. Kyle Hoagland.

Thank you, Vice Chancellor Owens. I am also pleased to be here this afternoon to talk about IANR's and the university's role and plans for water research and education now and in the future, and what this means for Nebraska. I think Nebraska's land-grant university is uniquely poised to become the top water research and education university in the nation, if not the world, and I do not say that lightly. In the next few minutes I'll describe the challenges we face, where we are now, and where we are headed as we work to,

◘ "Position the University to become the key resource in teaching, research, and extension education in water sciences, water resources management, and water policy to serve Nebraska ... ◘ and to become recognized as a national

and international leader in these areas."

I'd like to show you a brief video-clip from our Second Annual Water Law, Policy and Science Conference hosted this past April at UNL. The clip features Dr. Peter Gleick, probably the most knowledgeable person on the planet regarding global water resources, and a recipient of the distinguished McCarthur Award. ◘

Dr. Gleick is not alone in thinking that water is *the* most critical natural resource issue facing us. As Dr. Owens noted earlier, *water*, both quantity and quality, was consistently one of two issues identified in IANR listening sessions with our constituents, which we hold to hear Nebraskans' top concerns.

◘ ◘ In 2004, the National Academy of Science, through the National Research Council, produced a report that identified research topics that need to be addressed in the U.S. over the next 10-15 years. Topics were grouped into

three broad categories, ◘ water availability or water quantity, ◘ water use, including water quality, and ◘ water institutions. We have serious water resource challenges in Nebraska and in the region that fall under each of these headings.

◘ Drought is clearly one of the most critical issues affecting the Great Plains today. I know Don Wilhite just provided you a global view of water resources, so will not talk a lot about drought, other than to note that ◘ drought *and* water use have resulted in declines in the High Plains Aquifer, 67 percent of which lies beneath Nebraska. This map shows declines across the region from pre-irrigation to 2001, with the brighter colors showing the greatest declines. As you can see, cotton farmers in the Texas Panhandle are in serious trouble, with water table declines of more than 150 feet in some areas. Nebraska looks pretty good on this map, but

that too is changing. I believe *now* is the time to sustainably manage the aquifer, not when it's colored red or pink - this is clearly one time when we don't want to be Big Red!

◘ This map produced by the Conservation Survey Division in the School of Natural Resources shows groundwater level changes from spring 2003 to spring 2004. Note those areas colored red or pink; 2-5 foot declines were not uncommon in many parts of the State in just one year. This is in part due to drought, ◘ but is also a result of water over-development. This map shows the current distribution of the >100,000 irrigation wells (the black dots)and surface water irrigation projects (in blue), demonstrating the extent to which we have altered the hydrologic cycle across the state, particularly in the Platte River valley.

We also face a number of water quality issues in the region. ◘ The EPA identifies non-point source agrichemical inputs of nutrients into fresh waters as the number one cause

of water quality impairment in the U.S. This is a fish kill (POINT) at Pawnee Reservoir near Lincoln, primarily the result of high phosphorus inputs from row crop fields in the watershed. ◘ Excessive nutrients can lead to toxic blooms of algae, something we saw a lot of last year and again this year. ◘ Nitrate contamination of ground water is a significant problem in some parts of the state, ◘ where levels exceed the 10 ppm drinking water limit. ◘ This health risk is an expensive one to mitigate, as in Seward ◘ , where they spent $4.3M ◘ to build a new treatment plant, primarily in response to high nitrate levels. ◘ Arsenic in rural drinking water is a rapidly emerging issue as well. Again, ◘ note the scale and the location of concentrations that will exceed the proposed 10 ppb health limit, particularly in western Nebraska.

◘ So, how is the University of Nebraska addressing these challenges? Let me highlight just a few of the new and ongoing projects and programs of direct interest. ◘ For drought, the National Drought Mitigation Center located here at the University has taken the lead nationally and internationally in addressing drought issues, ◘ including serving as one of the three primary authors of the ◘ weekly drought monitor in USA Today and ~25 other newspapers throughout the country.

We have ◘ an economic study of water use alternatives from Lake McConaughy underway; and two of our researchers have developed a spreadsheet for farmers called ◘ the "Water Optimizer" to assist them in making irrigation choices under limited water allocations. Literally decades of research on irrigation technology and use allowed this comprehensive decision-support tool to be implemented so

rapidly.

◘ Faculty in CALMIT (our remote sensing/GIS center at UNL) are leading the way in water quality monitoring using remote sensing. This image is of an aquaculture facility in Mississippi, showing chlorophyll levels in each pond, a surrogate for the amount of algae, which would take hours to measure on the ground. This approach now is being applied to several sandpit lakes near Fremont and the east coast of the U.S. ◘ Our faculty are assisting with the Cooperative Hydrology Study (or COHYST) modeling effort ◘ along the Platte River. This model is being used in part to develop water management plans as LB962 is implemented throughout the State.◘ Our assistant director of the Water Center is testing the use of alum in treating sandpit lakes with extremely high nutrient levels and toxic algal blooms. This is a non-toxic approach that had never been used in

Nebraska at the whole-lake scale. Faculty at the University of Nebraska Medical Center, the University of Nebraska at Kearney and the University of Nebraska at Omaha also are working on water issues.

◘ Right now we are working to *integrate* the over 80 water faculty (POINT) at the University to address the increasingly complex issues at hand, and to convey this multi-disciplinary approach to our students. This is already beginning to happen in some big ways in the water area. ◘ The Sandhills Biocomplexity project addresses how water and vegetation interact to stabilize the Sandhills over long time periods. ◘ This large, multi-disciplinary project integrates faculty across the UNL campus. ◘ A large project to classify all of the lakes in Nebraska ◘ involves numerous faculty from natural resources, engineering, and geosciences. Most recently, a project to address ◘ arsenic issues in western

Nebraska teams water quality scientists with ◘ faculty and staff from UNL's Public Policy Center. This photo shows a town hall meeting in Stromsberg, one of several facilitated by UNL faculty and staff to engage local citizens. This project, a model for the future, addresses water *and* its societal dimensions, in an effort to solve a real problem of local and regional concern.

◘The **Water Resources Research Initiative** at UNL was launched in late Fall 2003. We hired ◘ several new water faculty to help create critical linkages among our existing faculty, and fill critical gaps in our combined expertise. We have hired water faculty in water chemistry ◘ ...◘ ...◘ ...◘ ...◘ ... and surface hydrology. In every case we got our top candidate. A majority of these faculty have joint appointments in two departments, further integrating our water faculty.

◘ We've made progress in strengthening university ties with several key state and federal agencies, to enhance research opportunities, provide internships for students, and contribute more to local and regionally-based challenges.

◘ Thanks to the efforts of our congressional delegation and UNL administrators, we have been successful in obtaining federal earmark funds through EPA Region VII to apply directly to COHYST, economic studies on Lake McConaughy, and contaminated soil-water clean-up research. ◘ We purchased new equipment for the Water Sciences Laboratory, the core facility for water science faculty. This is now one of the **top 3** water analytical labs in the nation. When the State received a report of an unknown organic contaminant in a drinking water supply, they contacted the WSL to determine exactly what it was. Within one day we were able to determine that it was anti-freeze.

◘ The Water Initiative has begun a series of water law, policy and science conferences. Last year we chose water law as the theme, and brought in the top water law speakers from across the U.S. The conference attracted 250 people. ◘ This year's conference focused on drought and climate change. It drew 175 attendees, and keynote speakers of international quality.

◘ Because of the Water Initiative, we are in a much better position to train the next generation of water scientists, water managers, and decision-makers by ◘ expanding the water science major, ◘ as well as expanding and improving our graduate program. ◘ We plan to increase our regional and national visibility by ◘ building upon our annual water conference, which ultimately will pay off in terms of ◘ student and faculty recruitment, collaborative

research opportunities, and public outreach. ◘ Over the next 6-12 months we will enhance our relationships with key federal agencies, for example, by focusing on the USDA's research arm, the Ag Research Service, to develop significant new resources to address the High Plains Aquifer.

◘ I envision creating a new Water Research & Education Center devoted to ◘ water management on the Great Plains, addressing the critical challenges I described earlier. All these challenges – drought, climate change, water quality, and lake restoration – have crucial societal dimensions. This requires ◘ a truly multi-disciplinary approach, as well as ◘ developing a monitoring network modeled after weather data networks. We monitor weather very well, but that's just one component of the hydrologic cycle. ◘ We are seeking additional funds to hire faculty ◘ in water policy and computer science.

That's a brief picture of what we're doing at the university now, and our hopes for the future. John, I'll turn things back to you.

Thank you, Kyle. As each of you present here today can see, water is a key area of research and education at your land-grant university, as well it should be. Here in Nebraska we sit over a majority of the largest underground aquifer in the Western Hemisphere, and likely in the world. We rank 10th in the nation in the number of streams and river miles in our state, and have approximately 2,000 natural lakes, mainly in the Sandhills. We are stewards of over 800 sandpit and barrowpit lakes, primarily in the Platte Valley, and over 1,800 reservoirs. We rank 16th in the nation in total wetland acreage.

Water matters to us all, and at the university we are seeking solutions to Nebraskans' – and our world's –

concerns. Dr. Hoagland and I would be happy to answer any questions you might have. ◘ Thank you.