

Missouri Basin Regional Climate Collaboration – March 8, 2011 – Nebraska City, Nebraska

USGS Climate Science in the Missouri Basin

Secretarial Order – 3289 – “Addressing the Impacts of Climate Change on America’s Water, Land, and Other Natural and Cultural Resources”. <http://130.11.48.178/nccwsc/main/files/2010/03/SecOrder3289.pdf>

Biological Carbon Sequestration Fact Sheet – “Assessing Carbon Stocks, Carbon Sequestration, and Greenhouse-Gas fluxes in Ecosystems of the United States under Present conditions and Future Scenarios”. <http://pubs.usgs.gov/fs/2011/3007/pdf/fs2011-3007.pdf>

Geologic Carbon Sequestration Report – “A Probabilistic Assessment Methodology for the Evaluation of Geologic carbon Dioxide Storage”. <http://pubs.usgs.gov/of/2010/1127/ofr2010-1127.pdf>

National Climate Change and Wildlife Science Center (NCCWSC) Fact Sheet - “Delivering Science to Help the Nation’s Fish, Wildlife, and Ecosystems Cope with Climate Change”. [http://nccwsc.usgs.gov/documents/NCCWSC_FACT_SHEET_NOV2010%20\(INFO_sheet112310\).pdf](http://nccwsc.usgs.gov/documents/NCCWSC_FACT_SHEET_NOV2010%20(INFO_sheet112310).pdf)

NCCWSC Funded Study - "Avian conservation in the Prairie Pothole Region, northern Great Plains: understanding the links between climate, ecosystem processes, wetland management, and bird communities". Lead PI – Susan Skagen, (skagens@usgs.gov) with seven co-PIs from Biology, Water, and Geology. The study was awarded \$1.158M for three years, beginning in early FY10 and planning on completion in mid-FY12. The study will unify work in climate downscaling and analyses, hydrological and ecological modeling, and avian niche modeling with the goal of informing waterbird management in the face of climate change.

DOI Climate Science Centers (CSCs) - Climate Science Centers will provide scientific information, tools and techniques that land, water, wildlife and cultural resource managers and other interested parties can apply to anticipate, monitor and adapt to climate and ecologically-driven responses at regional-to-local scales. <http://nccwsc.usgs.gov/csc.shtml>

Coordination of NCCWSC, DOI-CSCs, and DOI-LCCs – DOI bureaus will be pooling resources to support and leverage the joint work of CSCs and LCCs. Project-level funding and implementation, and regulatory, management, and policy decisions will continue to be the responsibility of each bureau and partner, in accordance with their mission-related responsibilities. <http://www.doi.gov/whatwedo/climate/strategy/loader.cfm?csModule=security/getfile&PageID=23288>

Other USGS Climate Science Resources

Climate Effects Network - Greater Platte River Basin. <http://pubs.usgs.gov/fs/2009/3097/pdf/fs2009-3097.pdf>
Project Coordinator - James C. Cannia (jcannia@usgs.gov). The project was awarded \$680K for work during FY10 and FY11. Work includes a GAP Analysis and a Science Plan for the 5 priority topics (Invasive Species, Groundwater, Surface Water, Ecosystems and Paleoclimate). A White Paper and Fact Sheets should be finished by September. The project also conducted research on paleoclimate and surface water records, limited airborne geophysical mapping of the Crescent Lakes National Wildlife Refuge, and OSL age dating of sediments in Crescent Lakes NWR to estimate dates of sand dune activity.

The National Map – *The National Map* is a collaborative effort among the USGS and other Federal, State, and local partners to improve and deliver topographic information for the Nation. *The National Map* is easily accessible for display on the Web, as products and services, and as downloadable data. The geographic information available includes orthoimagery (aerial photographs), elevation, geographic

names, hydrography, boundaries, transportation, structures, and land cover. Other types of geographic information can be added within the viewer or brought in with *The National Map* data into a Geographic Information System to create specific types of maps or map views. <http://nationalmap.gov/>

Drought Monitoring with Vegetation Drought Response Index (VegDRI) -
<http://pubs.usgs.gov/fs/2010/3114/pdf/fs2010-3114.pdf>

Essential Climate Variables – Essential climate variables (ECVs) are terrestrial variables identified by the Global Climate Observing System that are technically and economically feasible for systematic observation that will allow the evaluation of current land and water conditions and monitor long-term trends in resource status and conditions. Candidate ECVs that are being developed by USGS include land cover, surface water extent, snow – ice, albedo, leaf area index, fire disturbance, and land surface temperature. <http://www.fao.org/gtos/doc/pub52.pdf>

Biomass for Energy and Other Ecosystem Services in the Great Plains - The demand for biofuels as a step toward energy independence, coupled with climate change, can dramatically alter landscape processes in the Great Plains. New intensive crop management systems, cultivars that withstand drier growing conditions, and incentives for biofuel crops have already encouraged agricultural expansion, as evidenced by recent conversion of significant acreage of grasslands to croplands. USGS has implemented an integrated approach to quantify ecosystem services at multiple scales under current and prospective future landscape conditions to estimate effects of land use and land-use change on biogeochemical cycling, greenhouse gas emissions, wetland function, water quality, animal habitat, and other ecosystem components and processes. This research is geared to show multiple and simultaneous outcomes from land management and policy decisions, as well as highlight alternatives to mitigate effects from climate change. <http://lca.usgs.gov/lca/projects.php?id=4>

Comments for some of the Questions

USGS Resources in the Missouri Basin – Biology Science Centers in Fort Collins, Bozeman, Jamestown, and Columbia. Water Science Centers in all states within the Basin. Cooperative Fish and Wildlife Research Units at all land grant universities except North Dakota. Earth Resources Observation and Science (EROS) Center. USGS Science Centers at the Denver Federal Center.

Top priorities for NCCWSC and CSCs – 1) forecast fish and wildlife population and habitat changes in response to climate change; 2) assess the vulnerability and risk of species and habitats to climate change; 3) link models of physical climate change with models that predict ecological, habitat, and population responses; and 4) develop standardized approaches to monitoring and link existing monitoring efforts to climate and ecological or biological response models.

North Central Climate Science Center - The North Central CSC was the fifth DOI-CSC to be named. However, implementation is delayed pending passage of a FY11 federal budget. The USGS is taking the lead on establishing the CSCs and providing initial staffing. The North Central CSC University Consortium consists of Colorado State University (host university), University of Colorado, Colorado School of Mines, University of Nebraska-Lincoln, University of Wyoming, Montana State University, University of Montana, Kansas State University, and Iowa State University. Ultimately, funds and staff from multiple Interior bureaus will be pooled to support these Centers and ensure collaborative sharing of research results and data. Other federal agencies, states, tribes, and other partners are also welcome. Although, the North Central CSC is waiting for a FY11 federal appropriation to formally start, planning has begun with the drafting of a Science Plan and with discussions for organizing an executive-level Stakeholder Advisory Committee. The Stakeholder Advisory Committee will set regional science priorities and will work collaboratively with other organizations to avoid redundancy.