



# NORTH DAKOTA VIEW REMOTE SENSING ACTIVITIES 2015 - 2016



## BAKKEN OIL SHALE PLAY WEB-ENABLED GIS

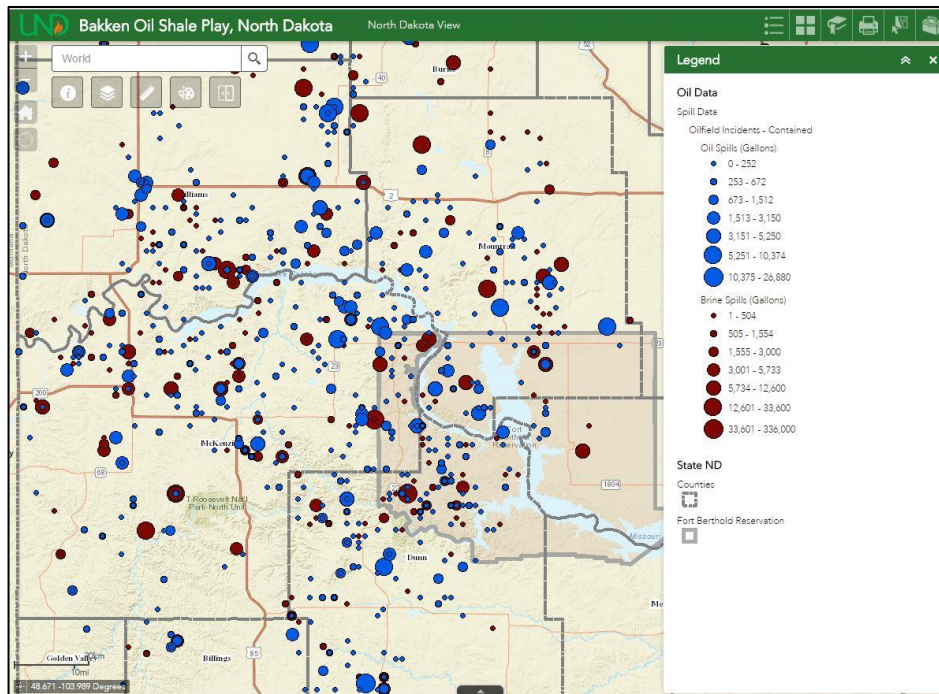
The objective of this project is to deliver geospatial resources to people living in the vicinity of the Fort Berthold Indian Reservation, a region of the State of North Dakota that is highly impacted by the Bakken Oil Boom. Geospatial data is provided through the creation of a database built upon USGS Landsat satellite imagery along with other raster and vector spatial layers that represent physical, administrative, socio-demographic, economic, industrial and other aspects of life in the area. The idea is to provide residents of the region with easy access to the data through a simple web-browser; this is especially important given the ongoing activities of the Bakken Oil Shale Play, which is changing the landscape of the region rapidly.

The web GIS is accessed at <http://undgeography.und.edu/flex/fortberthold/>. NDView continues to develop and update the site as the situation on the ground evolves and as data become available. The goal is to maintain the site with up-to-date data on oil development activities and other landscape changes.

NDView considers this effort to be a springboard to the development of a community mapping center on the UND campus that will include participation from partner academic institutions and organizations. The community mapping center will work to provide geospatial data and cartographic products and services that address the wide-ranging needs of communities and non-governmental organizations in North Dakota.



An example of land-cover change associated with the Bakken Oil Boom. The top image was acquired in 2003 and the bottom in 2014, showing the development of several oil well pads. Source: USDA NAIP



Web GIS layout showing oil spills and brine spills in 2016 in the vicinity of the Fort Berthold Indian Reservation (shaded area) in west-central North Dakota.

The Bakken Oil Boom web GIS is just one of the outreach projects that NDView is involved in. Others include making presentations about remote sensing in general, and NDView and the USGS Landsat program in particular, to undergraduate and graduate students, K-12 teachers, and special interest groups.

North DakotaView is a member of the AmericaView Consortium, a nationally coordinated network of academic, agency, non-profit, and industry partners and cooperators that share the vision of promoting and supporting the use of remote sensing data and technology within each state.



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## BENEFITS TO NORTH DAKOTA

NDView works to raise awareness about how remote sensing can contribute to solutions to the complex environmental challenges facing the citizens of North Dakota. For example, NDView has developed tools to put Landsat and other data related to pervasive flooding in the Devils Lake Basin into the hands of the public through the development of web-enabled GIS. In addition, the group is engaged in monitoring interactions between prairie vegetation and weather, gathering important baseline data for environmental change research, and educating K-12 students and University of North Dakota (UND) undergraduates about surface water flow dynamics using the Augmented Reality Sandbox (ARS).

The consortium reaches its goals by providing formal and informal education and training opportunities, developing new tools for data dissemination, conducting and supporting applied research, and promoting the professional development of students with interests in geospatial technologies, including the award of four \$750 scholarships to undergraduate or graduate students from partner institutions every year.



UND Geography undergraduate students preparing to use the Augmented Reality Sandbox in a presentation about introductory Earth science to K-12 students during a recent open house event.



Recent winners of NDView scholarships. From left, Jacqueline Amor, UND Geography MS student, studying how Elk use agricultural landscapes, Andrew Barnas, UND Biology MS student, working with UAS data; Kelsey Forward, UND Geology MS Student, mapping groundwater recharge using satellite and UAS imagery, and Papia Rozario (not pictured), North Dakota State University (NDSU) Geosciences PhD student, modeling watershed vulnerability.

## NORTH DAKOTA VIEW CONSORTIUM MEMBERSHIP

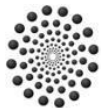
NDView's partners work together to improve remote sensing and geospatial technology education at all levels within the State of North Dakota. NDView seeks to effectively educate students for the geospatial workforce of the future. The consortium also works on outreach and applied research projects that benefit the citizenry of the state.



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