

FAQS

What is a Digital Elevation Model (DEM)?

Data points representing latitude, longitude, and elevation are combined to create a digital representation of the earth's surface.

What is LIDAR?

LIDAR - Light Detection and Ranging is an integration of airborne laser and global position system (GPS) technology. Laser pulses are directed at the earth's surface (early spring or late fall) from equipment aboard an aircraft flying a predetermined grid over an area of interest. The laser reflections are recorded and the range is calculated from the instrument's orientation in space and the time required for the laser's light reflection to travel back to the aircraft.

How accurate is the information collected using LIDAR technologies?

Accuracy is directly related to the altitude of the aircraft and the power of the laser. The current specification standard:

- Vertical - Bare earth: 15 cm (0.492 feet)
Root Mean Square Error (RMSE)

Are there proven technologies to store and distribute these large scale databases?

Yes. There are numerous public and private examples of models to store and disseminate large amounts of spatial data.

PROJECT TEAM



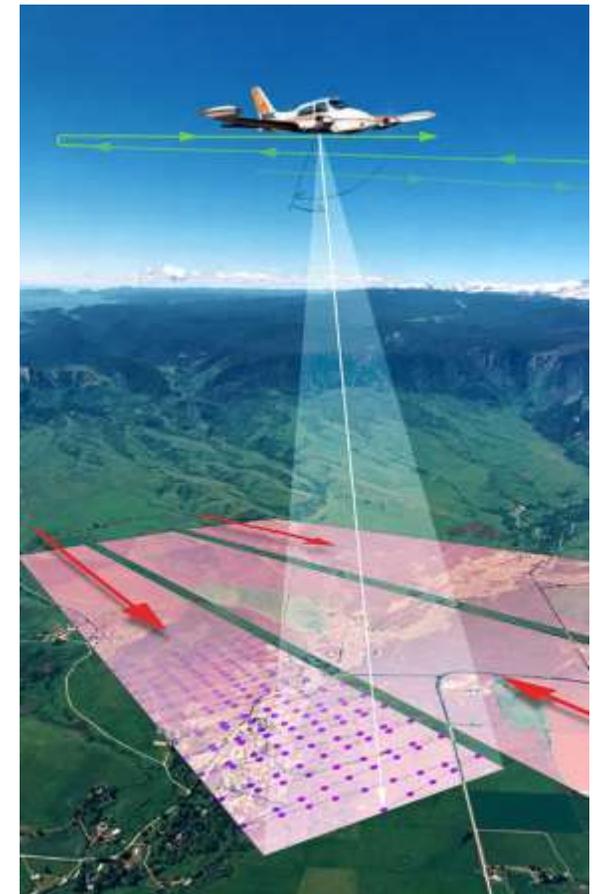
PARTNERS

The International Water Institute has received financial commitments from:

- US Geological Survey
- US Natural Resources Conservation Service (North Dakota)
- US Army Corps of Engineers
- ND Joint Red River Water Resources Board
- MN Red River Watershed Management Board
- MN Buffalo-Red Watershed District
- ND State Legislature
- MN State Legislature
- MN Department of Transportation
- City of Fargo, ND
- City of Moorhead, MN
- City of Breckenridge, MN
- City of Wahpeton, ND
- City of East Grand Forks, MN
- City of Grand Forks, ND

RED RIVER BASIN MAPPING INITIATIVE

“REDEFINING THE LANDSCAPE”



www.internationalwaterinstitute.org



BASIN MAPPING INITIATIVE

Project goal: to develop and publicly deliver a seamless highly accurate digital elevation map of the entire Red River Basin (RRB).

The unique geography of the RRB compromises the usefulness of standard national coverage topographic data sets (i.e. United States Geological Survey Quadrangle Maps) and their application to the decision-making process in the region. High-resolution topography has numerous public and private applications and is essential to developing disaster resiliency – our ability to predict, understand, and respond to disasters. Accurate topographical information greatly enhances the abilities of decision makers and resource managers to make equitable and defensible decisions and provides the foundation for developing innovative and effective resource management strategies.

PROJECT SPECIFICATIONS

The project scope includes the entire U.S. portion of the RRB (including the Devils Lake Basin). This approach maximizes the economy of size benefits and results in consistent end products because the collect establishes one specification standard and uses the same LIDAR sensors and platforms.

Data will be collected to US Federal Emergency Management Agency flood plain mapping standards. The International Water Institute will coordinate federal and non-federal funding partners, ensure data specifications are met, and contract with the private firm selected to collect the data.

Project deliverables include:

- Raw classified data (< 15cm RMSE)
- Filtered bare earth data (< 15cm RMSE)

- 1 meter bare earth digital elevation model (< 15cm RMSE)
- Third party quality assurance of data accuracy
 - Engineers validation report
- 0.5 meter GSD ortho-imagery (Phase 1 area)
- An open web-based data archival, management, and distribution system within the US Geological Survey Center for LiDAR Information Coordination and Knowledge (CLICK).
- Public outreach and education

PROJECT BENEFITS

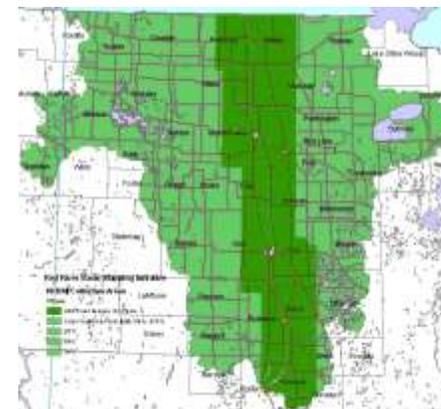
Benefits for resource managers, decision-makers, and residents of the RRB will be profound; enhancing resiliency, capacity, performance, and efficiency at every level of decision-making in each jurisdiction. Known benefits from high-resolution data include:

- More accurate flood plain maps
 - Flood damage mitigation
 - Increased flood and drought resiliency
- Targeted restoration activities
- Enhanced planning and project development
 - Transportation infrastructure
 - Land use management
 - Human development
- Detailed surface hydrologic and hydraulic modeling
- More efficient/equitable natural resources management
- Innovative tools for conflict resolution
- Problem identification
- Increased agricultural productivity
- Credible flood damage and natural resource enhancement project site selection criteria
 - Enhanced project evaluation tools
- Major cost reduction in all civic projects

Future applications using high resolution topographic data are boundless and limited only by our ability to comprehend how these data will eventually be integrated with new technologies and used to make decisions that enhance the lives of RRB residents.

PROJECT COST

Total Project Cost: \$5.0 million (50/50 non-federal/federal cost sharing).



The International Water Institute and partners have developed phased data collection strategy based on several criteria. The intent is to reasonably ensure that a collection area can be wholly completed based upon the available resources before proceeding to the next collection area.

NEXT STEPS

The International Water Institute has assembled the necessary funding partnerships from state, federal, and local partners. Phase 1 data collection begins April 2008.

The Institute is working with local partners through a cost sharing agreement for the US Corps Watershed Feasibility Study that will continue collection efforts fall 2008. Expected RRBMI project completion is spring 2009. Data products will be available approximately 195 days following collection efforts.