Illinois Airborne Light Detection and Ranging (LiDAR) Data Acquisition Plan

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State Champion and Data Management Staff

Sheena Beaverson serves as the state liaison for airborne Light Detection and Ranging (LiDAR) data projects within Illinois. Ms. Beaverson is the Program Manager for the Illinois Height Modernization effort; she is employed by the Illinois State Geological Survey (ISGS) which is part of the Prairie Research Institute (PRI) at the University of Illinois at Urbana-Champaign (UIUC). Other Illinois Height Modernization Program (ILHMP) staff members include Janet Camarca, the ISGS Remote Sensing Data Manager, and Matthew Jefferson, the ISGS Remote Sensing Data Analyst.

Ms. Beaverson maintains professional relationships with members of the ILHMP Steering Committee (see section 2. Below) and leads regular conference calls to discuss on-going data acquisition projects, establish consensus-based priorities for proposed new projects, and coordinate outreach activities within the State.

Best Practices

- Program Manager to act as liaison for proposed LiDAR data projects
- Future project priority list for LiDAR data acquisitions kept current
- Vendor contracting mechanism in place, if limited-time funding becomes available
  - Current multi-year agreements are with Merrick & Company and Woolpert
- Staff available to conduct LiDAR data QA/QC review before vendor contracts close
- Staff available to provide on-line data access and technical support for data users
- Illinois LiDAR data status map series (i.e. by Acquisition Year, by 3DEP QL Level, etc.)
- Maintenance of outreach materials and regular outreach efforts.

Lessons Learned

- Funding for Program Manager and support staff is difficult to secure/ always in peril
- Federal pass-through dollars useful for data acquisition but not reliable staff support
- Federal agencies will be guided by state future projects plan, if it’s readily available

Steering Committee

The ISGS serves as the lead state agency for airborne LiDAR data project coordination in Illinois; ISGS staff are informed and guided by a steering committee of state and federal partners. The ILHMP Steering Committee has been in place since 2010 and includes
stakeholders from federal and state agencies, with occasional input from local government representatives.

Federal agencies represented on the ILHMP Steering Committee include the Federal Emergency Management Agency (FEMA), National Geodetic Survey (NGS), Natural Resources Conservation Service for Illinois (NRCS Illinois), United States Geological Survey (USGS), and the United States Army Corps of Engineers (USACE). Representatives from NGS, NRCS Illinois, and the USGS are regularly engaged in committee discussions; representatives from FEMA and USACE provide input intermittently.

State agencies currently represented on the ILHMP Steering Committee include: the Illinois Department of Transportation (IDOT), the Illinois Department of Natural Resources – Office of Water Resources (IDNR-OWR), the Illinois Natural History Survey (INHS) of PRI, the Illinois State Archaeological Survey (ISAS) of PRI, ISGS of PRI, Illinois State Water Survey (ISWS) of PRI, and UIUC.

Local government representatives that have participated in Steering Committee discussions within the past few years represent: the Champaign County GIS Consortium, LaSalle County, the City of Ottawa in LaSalle County, Kankakee County, and Will County.

Membership on the ILHMP Steering Committee is extended to any person/agency representative that expresses an interest in contributing to the coordination of on-going or future LiDAR data acquisition and processing efforts. The committee does not currently include any representatives from tribal, nonprofit, for profit, education, technical or private sector, or political groups or agencies.

**Best Practices**

- Establish and maintain professional relationships with key stakeholders
- Schedule regular, bi-monthly or quarterly, conference calls
- Utilize annual SeaSketch and 3DEP BAA cycles to communicate project priorities
- Steering Committee discussions lead to list of data specification preferences

**Lessons Learned**

- Reliance on Steering Committee for unofficial information sharing is key
- Need to encourage some federal representatives to work with State Champion
- More frequent conference calls warranted when funds available to acquire data

**Historical Overview of Past Efforts**

The Illinois Height Modernization Program was established as part of the NGS National Height Modernization coordination effort. ISGS staff work to establish data sharing agreements to review, archive, and distribute any airborne LiDAR data acquired within the
State of Illinois. Data are offered on-line as originally delivered LAS tiles or as the derivative products of Digital Elevation Model (DEM) or Digital Terrain Model (DTM), and Digital Surface Model (DSM). Access program information and data at the Illinois Geospatial Data Clearinghouse: https://clearinghouse.isgs.illinois.edu/data/elevation/illinois-height-modernization-ilhmp-lidar-data.

Illinois will achieve first-time statewide LiDAR data coverage early in 2019, upon delivery of data for seven counties acquired in 2018. This an opportune time to document the history of our patchwork of 102 county data sets and to establish a formal plan to reacquire the oldest, lowest resolution collections.

In recent years, data acquisitions have been prioritized for counties that have no LiDAR data or that have older LiDAR data collections and/or collections acquired at lower 3D Education Program (3DEP) Quality Level (QL) parameters (i.e. QL3). (See Appendices 1. and 2., which depict Illinois LiDAR data collection Acquisition By Year and Illinois LiDAR data by 3DEP Quality Levels, respectively.) LiDAR data have recently been collected in northeastern Illinois to replace older collections from 2007 and 2008 and in west central Illinois to fill the last remaining data void in Illinois.

The 102 county collections are roughly comprised of 5% of data at QL1, 30% at QL2, and 65% at QL3; acquisition dates range from 2008 to 2018. An FY19 USGS 3DEP grant will refresh data for 9 counties that have QL3 data from 2008 and 2009 in the Fall of 2019, representing about 5% of Illinois (See Appendix 3, showing Illinois LiDAR Data project priorities uploaded to Seasketch in 2018; subsequently funded by federal agencies).

Funding to for past projects was provided by:

- State Agencies: IDNR, ISGS, IDOT
- County Agencies: Cook, Champaign, Kankakee, Lake, Kane, McHenry, and Will
- Federal Agencies: NRCS, USGS, FEMA, USACE
- Federal Pass-Through monies: Federal Highway Administration State Planning and Research program (FHWA SPR), Hurricane Ike federal disaster monies, federal appropriations, and 3DEP BAA awards

**LiDAR Data Acquisition Plan for FY20 thru FY23**

An aggressive 4-year proposal to re-acquire all counties that have QL3 data has been developed; this plan has recently been uploaded to the SeaSketch interface, (See Appendix 4, showing Illinois LiDAR Data project priorities uploaded to Seasketch in 2019). The plan aims to acquire 15 counties in southern Illinois in federal fiscal year 2020 (FY20), this Area of Interest incorporates the Earth MRI initiative Area of Interest (AOI) in Illinois, which seeks to enable research for critical mineral areas across the United States. County data collections were acquired in 2009, 2011, 2012, and 2014; the area includes re-acquisition of two small counties acquired at QL2 in 2012 in order to facilitate critical minerals research with contemporary data sets. Subsequent acquisitions in FY21 and FY22 would acquire 33
counties ranging across central Illinois acquired in 2011 and 2012. The final block would be acquired in FY23; this includes 12 counties in southwest Illinois which were originally acquired in 2011, 2012, 2014 and 2015; this area includes re-acquisition of one county acquired at QL2 in 2014.

At the present time, no state funding is available to apply to this aggressive timeline. However, recent information shared by representatives from FEMA, NRCS, USGS, and other representatives from states indicates that the federal government is planning to increase funding for LiDAR data acquisitions to plan to achieve nationwide QL2 data coverage by FY23. Although the USGS will continue to coordinate available funding via their Broad Agency Announcement (BAA) for the 3DEP activities, agencies that receive large amounts of funding will also prioritize and plan projects directly. This has been the case in FY19, with the nine oldest counties, with QL3 data from 2008 and 2009, being prioritized and funded by FEMA with supplemental funding from NRCS and USGS. With this in mind, setting a 4-year plan to reacquire data for all Quality Level 3 collections in Illinois is critical and timely. ISGS staff at PRI will be ready to adjust priority areas for any given fiscal year if federal funding becomes available through an agency with specific priority areas designated for Illinois. For example, FEMA has recently expressed an interest in prioritizing counties along the Mississippi River, Illinois NRCS would prefer to focus on the Little Wabash and Wabash Rivers, and the USGS has delineated Areas of Interest to support critical minerals research.

**State of Illinois Preferred Data Specifications**

Illinois data specification preferences defined by the ILHMP Steering Committee are:

- Adhere to current USGS Base Specifications as the absolute minimum
- Include classification of low/med/high vegetation and buildings classes
- Always generate hydrologic breaklines and a hydro-enforced DEM
- Acquire one complete county, at minimum; multi-county areas preferred
- Expand any AOI to include complete, rather than partial, counties
- Delineate new projects near recent project areas to create contemporary data regions
- Illinois prefers QL2 data with breaklines and added classes over QL2+ or QL1 buy-ups
- Request that funding partners fully process and publish all acquired data
Appendices – Illinois LiDAR Data Status Maps and SeaSketch Priority Project Submissions

1. Illinois LiDAR Data Acquisition by Year, April 2019

Illinois LiDAR Acquisition By Year

April 2019

8 Year Cycle

8 years ago
2011
2012
2013
2014
2015

4 years ago
2009

None
2010

Current

In Progress

In Planning

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2. Illinois LiDAR Data 3DEP Quality Levels

Illinois LiDAR Quality Levels

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For Access to LiDAR Data, Please Google:
Illinois Height Modernization (ILHMP): LiDAR Data
3. **SeaSketch for Illinois in 2018** – 9 counties submitted, 9 counties funded

4. **SeaSketch for Illinois in 2019** – 60 counties submitted for FY20 thru FY23