DELIVERABLE SUMMARY

Lot 4 of Task Order number G14PD00942 – Kidder County, North Dakota LiDAR consists of the following:

Raw Point Cloud Data

- LAS v1.2format
- Broken into Cross Tie and Calibration Lines and Production Lines
- There are some lines that have not been cut to 2GB segments. The large lines (over 2GB) were not cut to 2GB segments because Riegl software doesn't store the points in the collected order in the original flight line LAS files. If we run the automatic routine for segmenting the line, the points in each 2GB file won't be at one contiguous location.

Classified Point Cloud

- LAS v1.2 format
- 1,439 tiles

Bare Earth Surface

- ERDAS .IMG format
- 1,439 tiles

LiDAR Intensity Image

- Grayscale 8-bit GeoTiff/TFW format
- 1,439 tiles
- The intensity images for the Kidder LiDAR project are accurate with good quality suitable for feature identification and vector data collection. We have noted tonal variation in the intensity from lift to lift; refer to figures 1 and 2 below. All data in the project was collected by one Riegl 680i LiDAR sensor. The variation of the intensity values is present in the LAS data and is noticeable in the intensity Tiff images. We have confirmed that there is nothing wrong with the sensor. The affected lifts span a time period from April 24 – April 29, 2015. The LiDAR had a fixed attenuation throughout the project. In addition, the intensity is normalized during processing to account for biases; however, it is possible that moisture on the ground and vegetation contributed to tonal variations.
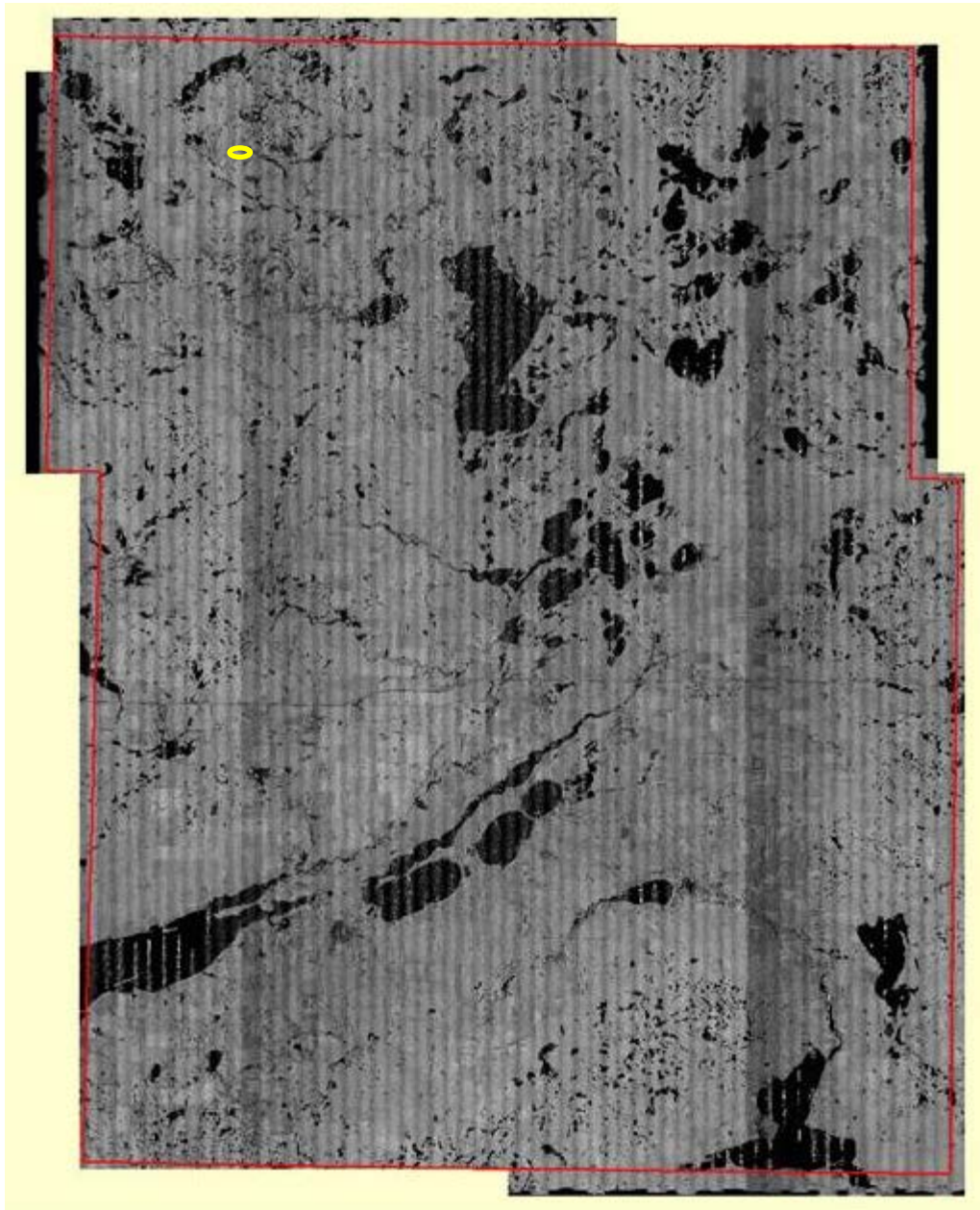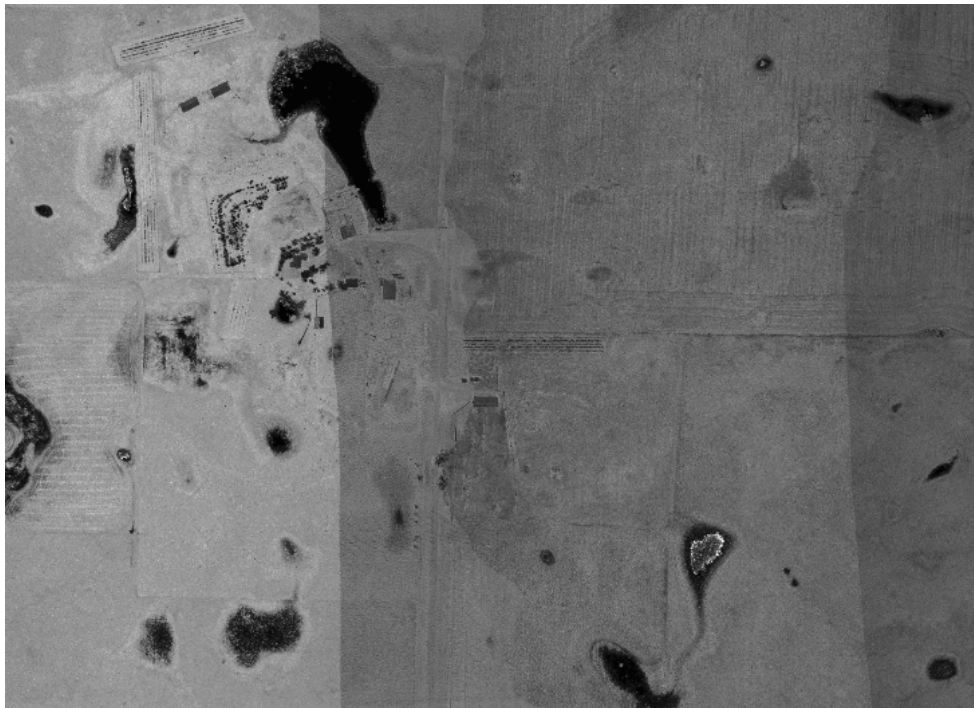
Figure 1

Figure 2

Hydro Flattened Breaklines

- Esri shapefile format
- The hydro flattened breaklines (rivers and lakes) were not clipped to the project boundary; does the USGS have any concerns with this?
- Some heavy marshy areas were subjective. These areas were carefully defined to create a bank to bank hydro flatted product. See figures 3 to 5 below showing an example of a compiled river a varying zoom levels
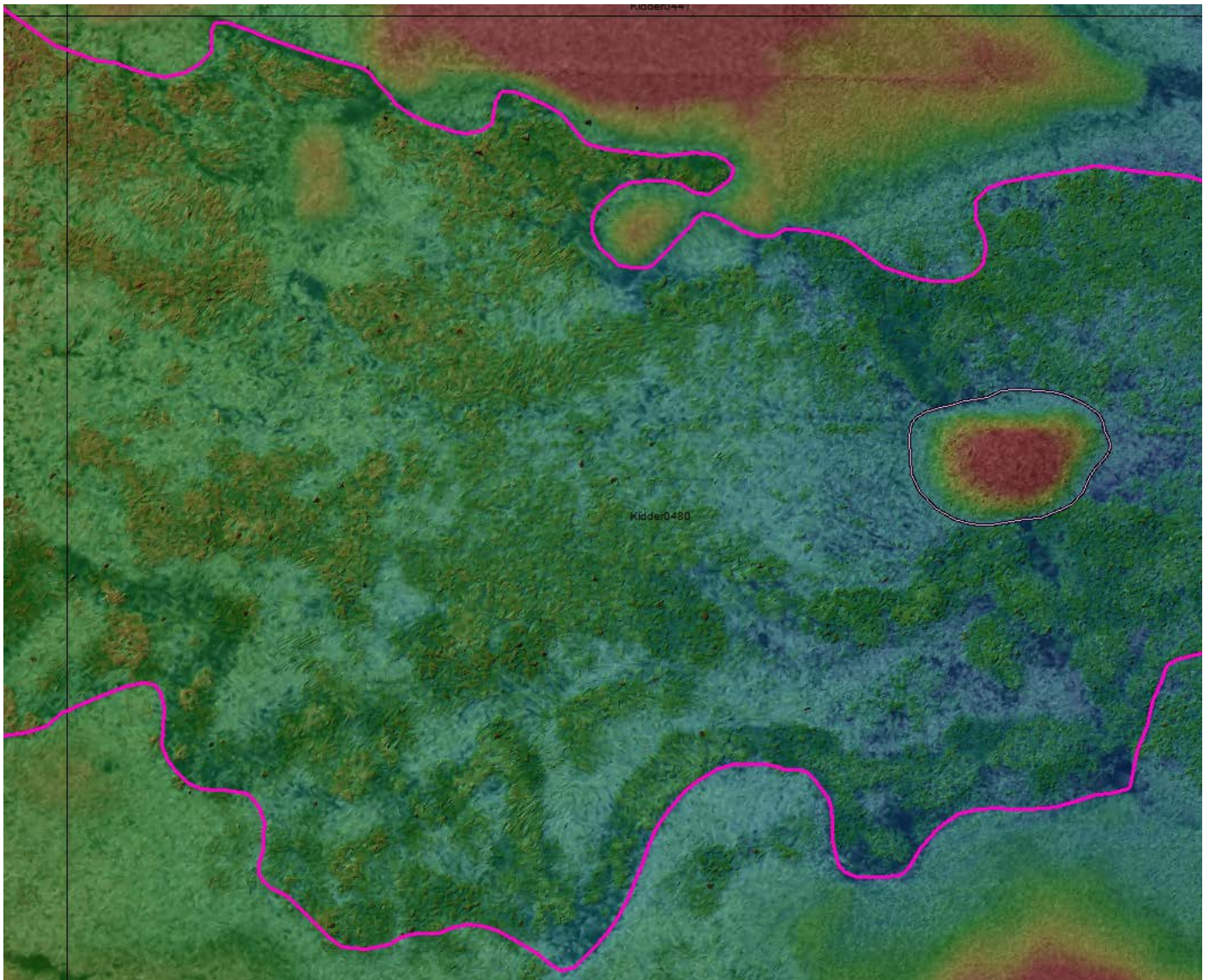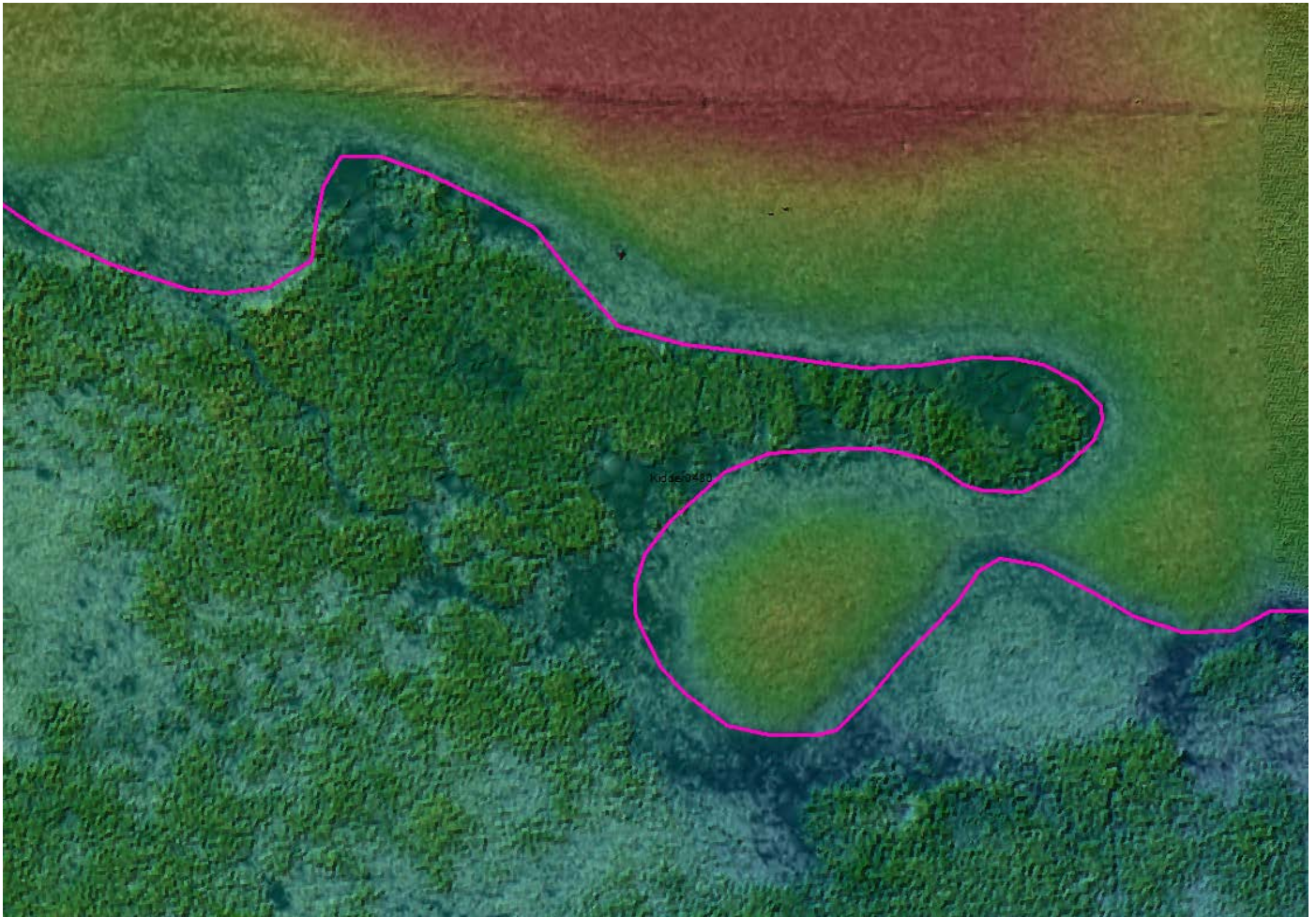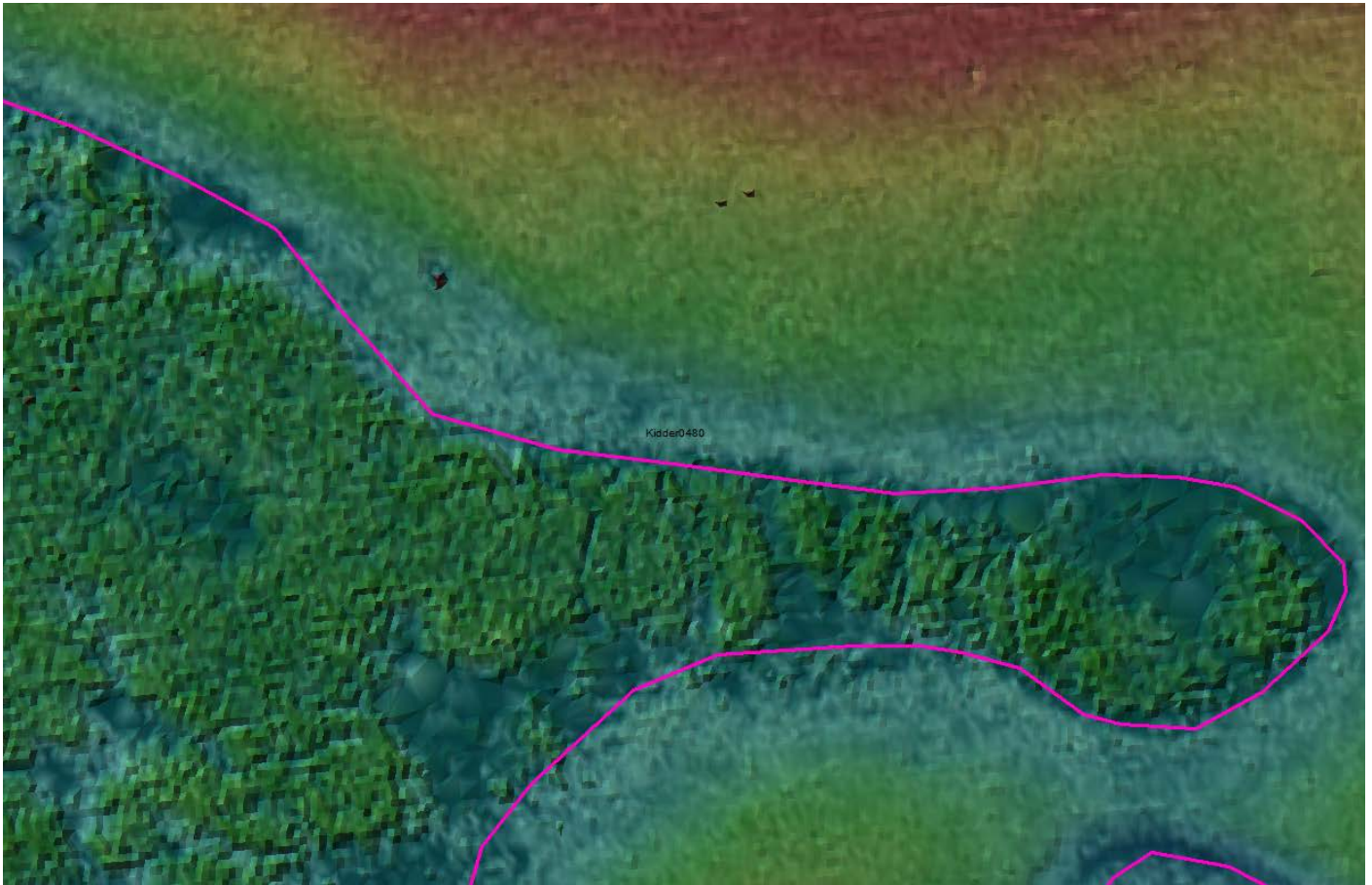
Figure 3

Figure 4

Figure 5

Metadata

- Collection Report
    - Previously delivered; PDF format
- Survey Report
    - Previously delivered; PDF format
- Data Extents
    - Project extents; shapefile format
- Product Metadata
    - Project
        - Overall project metadata file; XML format
        - Error (Line 15): Lidar_Aggregate_Nominal_Pulse_Density is required in Lidar_Collection_Information
        - Error (Line 15): Lidar_Aggregate_Nominal_Pulse_Spacing is required in Lidar_Collection_Information
        - Error (Line 36): Lidar_Raw_Nonvegetated_Vertical_Accuracy is required in Lidar_Accuracy_Information
        - Error (Line 36): Lidar_Raw_Nonvegetated_Vertical_Accuracy_Checkpoints is required in Lidar_Accuracy_Information
        - **NOTE:** These errors associated with version 1.2 of the U.S. Geological Survey National Geospatial Program Lidar Base Specification; the specification for this project is version 1.0
    - Lift
        - Metadata files for each lift of acquired data; XML format
        - Error (Line 15): Lidar_Aggregate_Nominal_Pulse_Density is required in Lidar_Collection_Information
        - Error (Line 15): Lidar_Aggregate_Nominal_Pulse_Spacing is required in Lidar_Collection_Information
        - Error (Line 36): Lidar_Raw_Nonvegetated_Vertical_Accuracy is required in Lidar_Accuracy_Information
        - Error (Line 36): Lidar_Raw_Nonvegetated_Vertical_Accuracy_Checkpoints is required in Lidar_Accuracy_Information
        - **NOTE:** These errors associated with version 1.2 of the U.S. Geological Survey National Geospatial Program Lidar Base Specification; the specification for this project is version 1.0
    - Product - One metadata file for the following; XML format
        - Classified Point Cloud
            - Error (Line 15): Lidar_Aggregate_Nominal_Pulse_Density is required in Lidar_Collection_Information
            - Error (Line 15): Lidar_Aggregate_Nominal_Pulse_Spacing is required in Lidar_Collection_Information
            - Error (Line 36): Lidar_Raw_Nonvegetated_Vertical_Accuracy is required in Lidar_Accuracy_Information
            - Error (Line 36): Lidar_Raw_Nonvegetated_Vertical_Accuracy_Checkpoints is required in Lidar_Accuracy_Information
            - **NOTE:** These errors associated with version 1.2 of the U.S. Geological Survey National Geospatial Program Lidar Base Specification; the specification for this project is version 1.0
        - Hydro Flattened Bare Earth DEM
            - No Errors

- Hydro Flattened Breaklines
  - No Errors
- Intensity Images
  - No Errors

Project Report

- Incorporates the QA/QC Reports and Processing Report; PDF format

Acquisition Reports

- Previously delivered; shapefile format

Tile Layout

- USGS tiling scheme; shapefile format