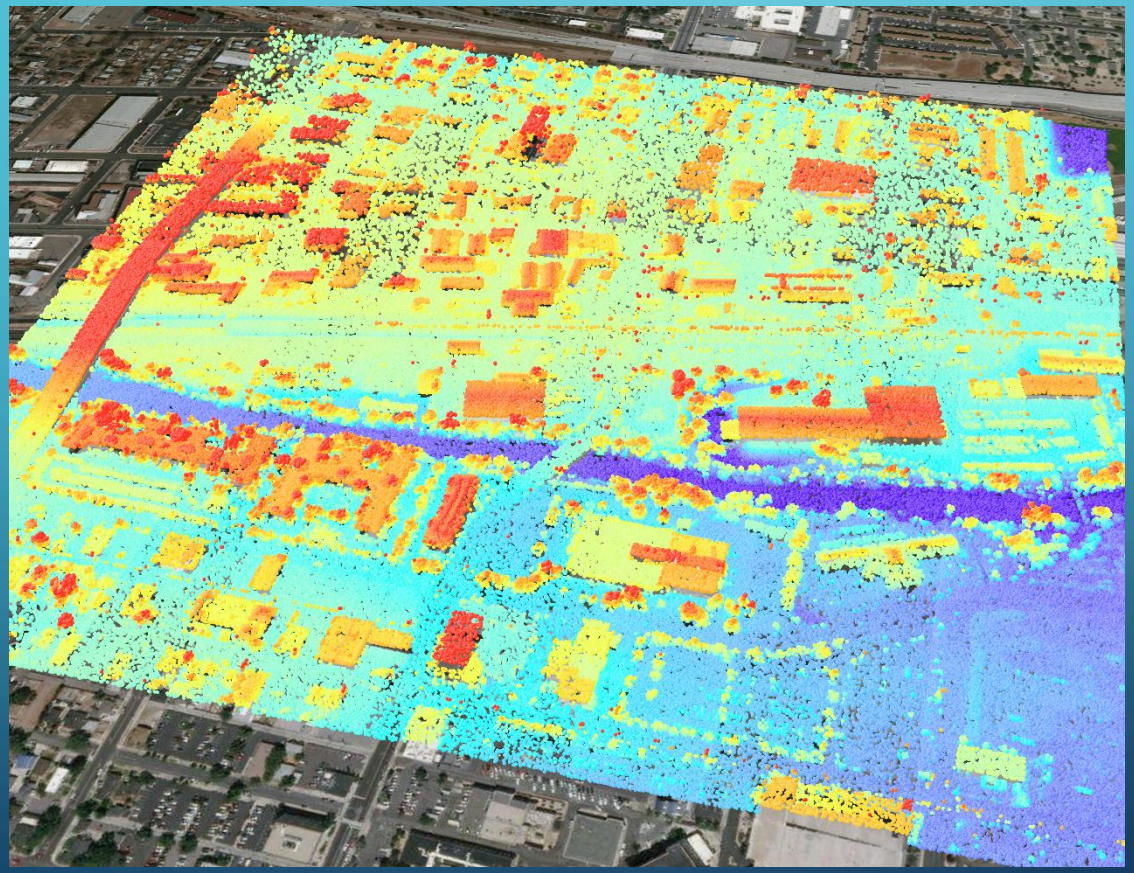
LIDAR PILOT DATA



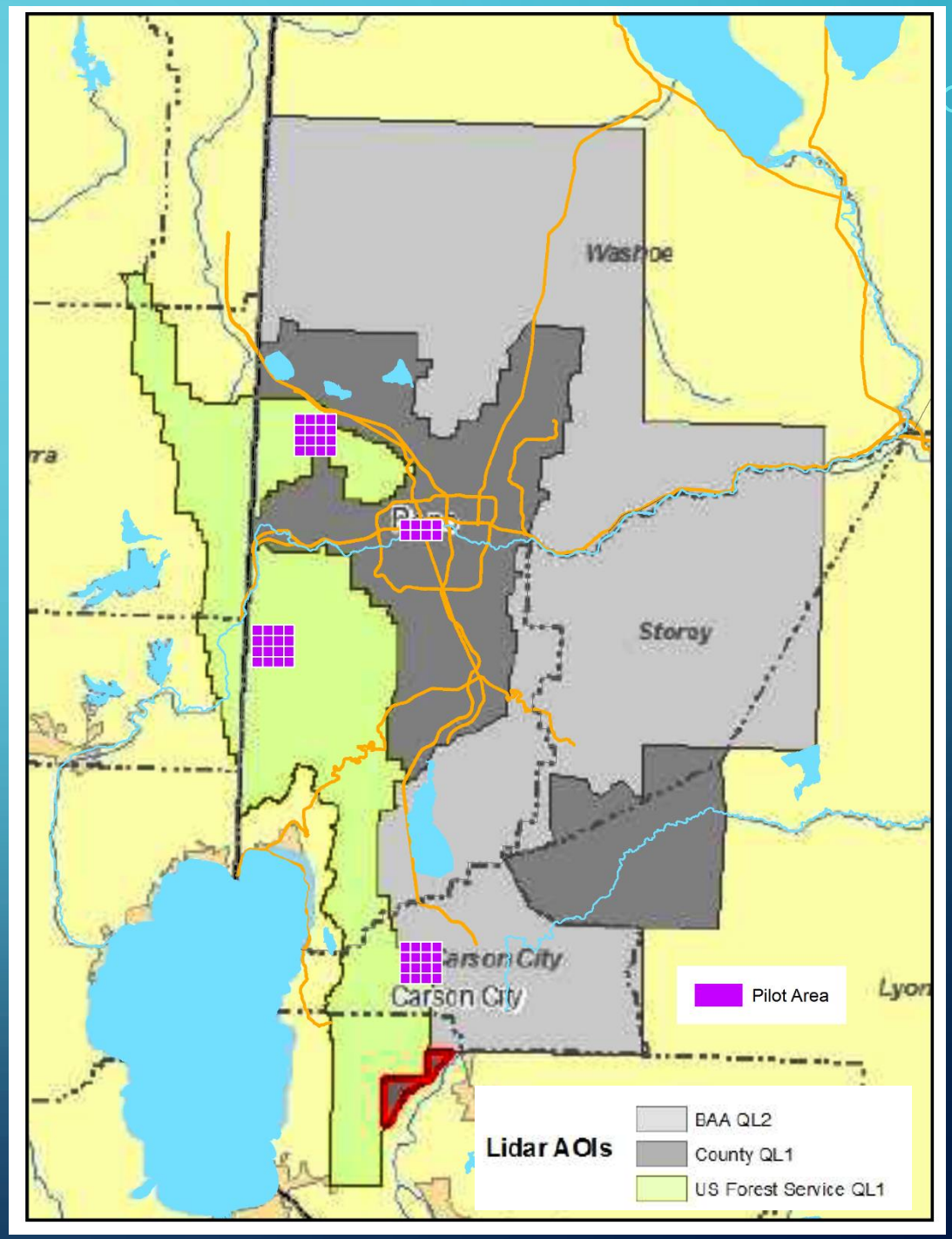
PROJECT AREA

QL1 = 681 sq miles *(Washoe = 435 sq mi)*
QL2 = 858 sq miles *(Washoe= 490 sq mi)*

Approximately:
1 TB of Raw LAS files (store offline)
1 TB of Classified LAS files *(Washoe = 660 GB)*
36GB of Bare Earth DEMs *(Washoe = 25 GB)*

Specifications

	Vertical Accuracy RMSEz	Nominal Pulse Spacing (NPS)	Nominal Pulse Density (NPD) Points/m²	DEM Post Spacing	Contour Accuracy
QL1	10 cm	0.35 m	8	**0.5 m**	1 foot
QL2	10 cm	0.7 m	2	**1 m**	1 foot



DELIVERABLES

- **Point Cloud (Raw and Classified)**
- **Breaklines**
- **Bare Earth DEM**
- **Metadata**

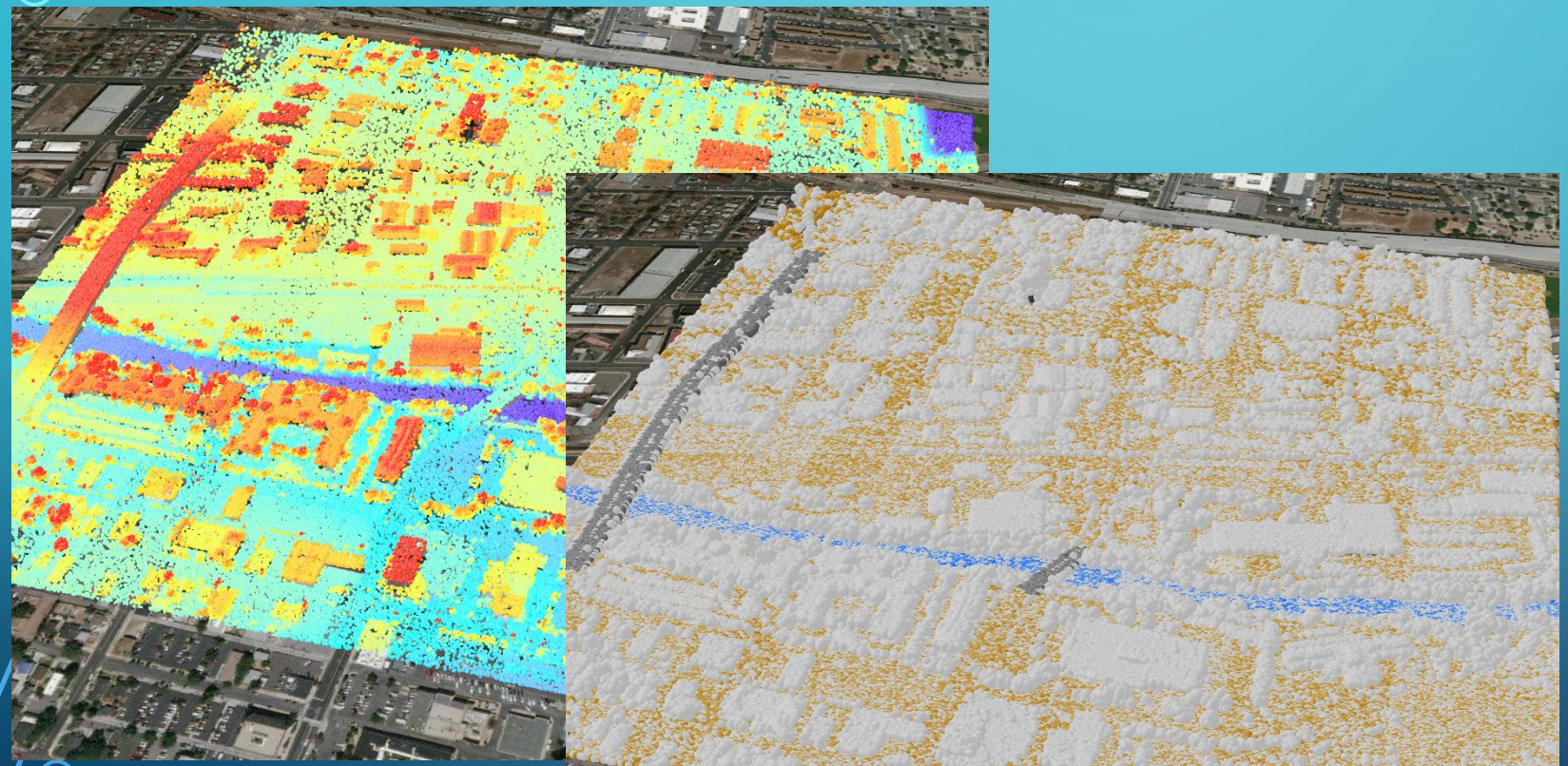
CLASSIFIED POINT CLOUD

- XYZ
- Intensity
- Return
- Classification

Class 1 – Processed, but unclassified
Class 2 – Bare-earth ground
Class 7 – Low Noise (low, manually identified, if necessary)
Class 9 — Water
Class 10 — Ignored Ground (Breakline Proximity)
Class 17 — Bridge Decks
Class 18 – High Noise (high, manually identified, if necessary)

SHAPE *	Z	Class	Return	Intensity
Point Z	1366.91	2	1	6375
Point Z	1367.12	2	1	5915
Point Z	1367.32	2	1	5300
Point Z	1367.01	2	1	6375
Point Z	1367.11	2	1	6913
Point Z	1367.22	2	1	6913
Point Z	1367.31	2	1	6299
Point Z	1366.84	1	1	5530
Point Z	1367.43	1	3	6683
Point Z	1372.36	1	2	20464
Point Z	1367.24	2	2	1920
Point Z	1374.04	1	1	11215
Point Z	1367.41	1	2	5223
Point Z	1372.5	1	2	1920
Point Z	1367.4	1	2	3456
Point Z	1367.38	1	2	2458
Point Z	1373.73	1	2	14871
Point Z	1375.37	1	2	3610
Point Z	1367.38	1	3	6913
Point Z	1372.36	1	2	20894
Point Z	1367.39	1	2	2150
Point Z	1375.3	1	2	8911
Point Z	1367.35	1	2	11906
Point Z	1367.33	2	2	8450
Point Z	1372.52	1	2	17882
Point Z	1372.99	1	2	12291
Point Z	1367.34	1	2	8296
Point Z	1367.37	1	2	11983
Point Z	1367.36	1	1	14672
Point Z	1373.54	1	2	14871
Point Z	1367.34	2	2	2688
Point Z	1374.92	1	2	12060
Point Z	1367.31	2	2	2074
Point Z	1367.4	1	1	13750
Point Z	1373.12	1	2	11138
Point Z	1367.27	2	2	2611
Point Z	1367.23	2	2	2381
Point Z	1375.19	1	2	2458
Point Z	1373.42	1	1	21324

QL1 -- POINT CLOUD, RAW AND CLASSIFIED

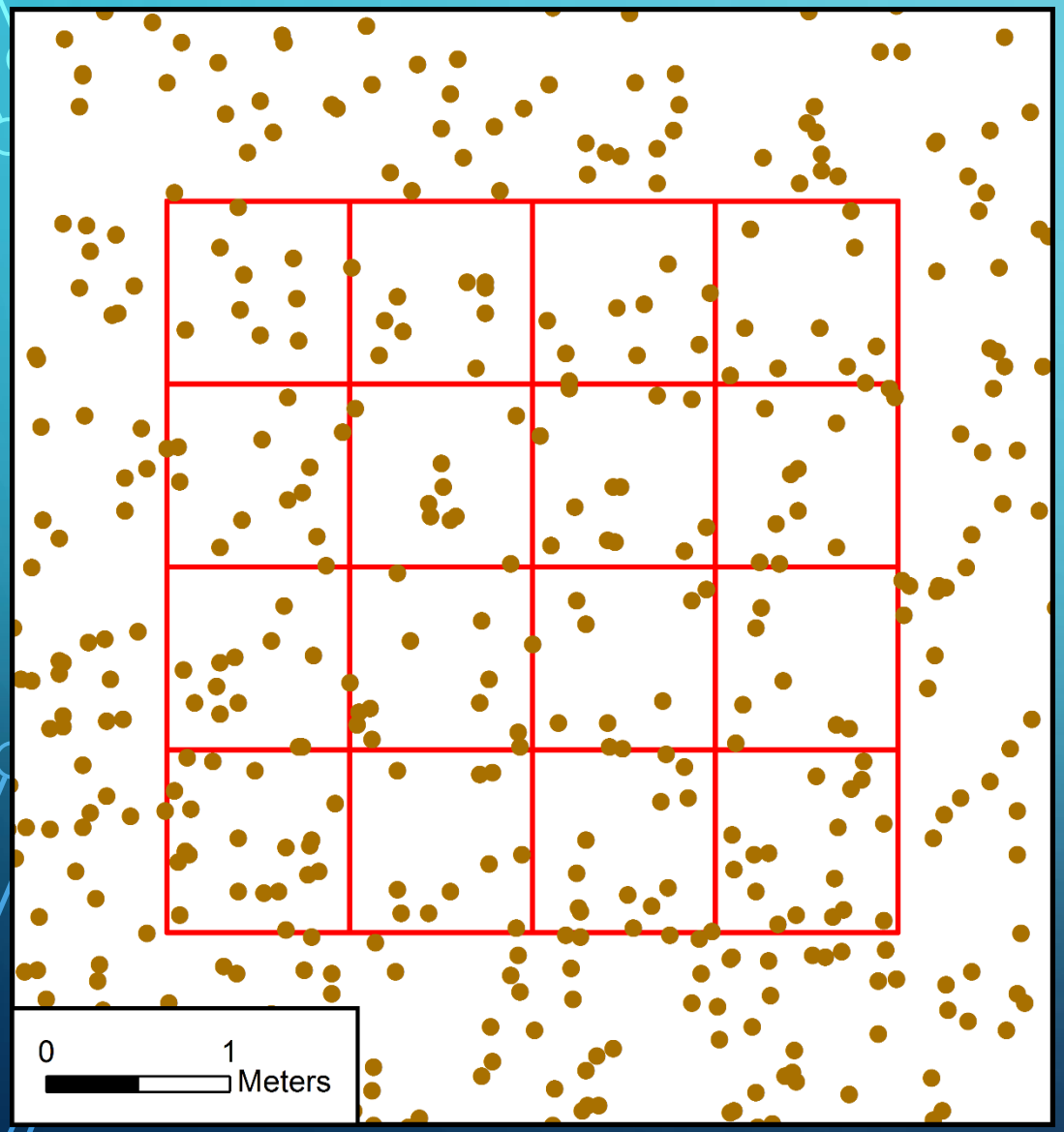


1,000m x 1,000m tile
1,000,000 1m^2 cells
9,106,215 lidar points
BULK Point density = 9pts/m^2
(Specification NPD = 8pts/m^2)

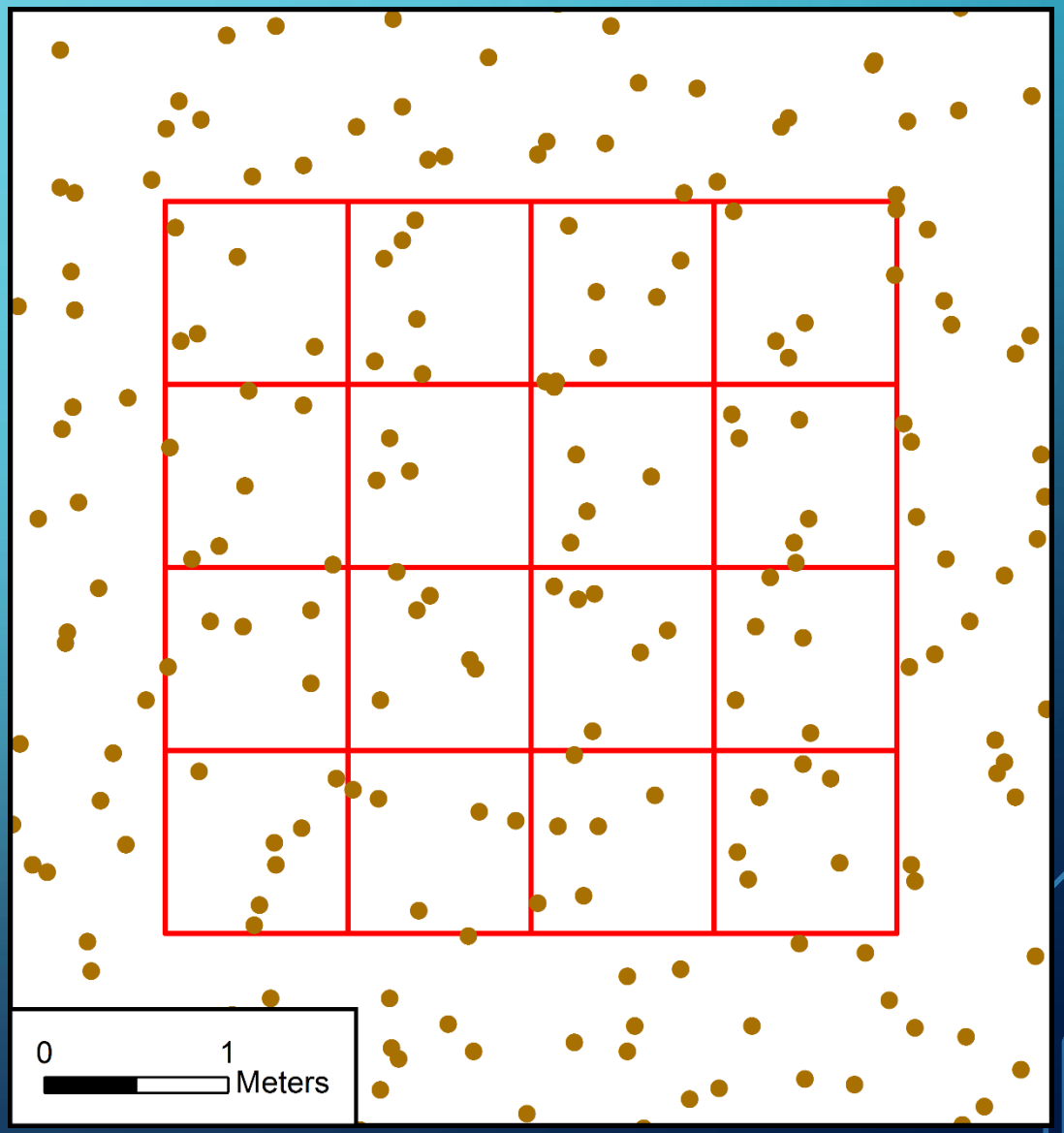
Classification code statistics:
1 Unassigned: 6,019,079
2 Ground: 2,811,716
7 Noise: 5,074
9 Water: 99,568
10 Rail: 344
17 Bridge Deck: 170,419
18 High Noise: 15

QL1 LIDAR SPOT DENSITY

HIGH OVERLAP AREA 11.9 PTS/M^2



LOW OVERLAP AREA 5.7 PTS/M^2



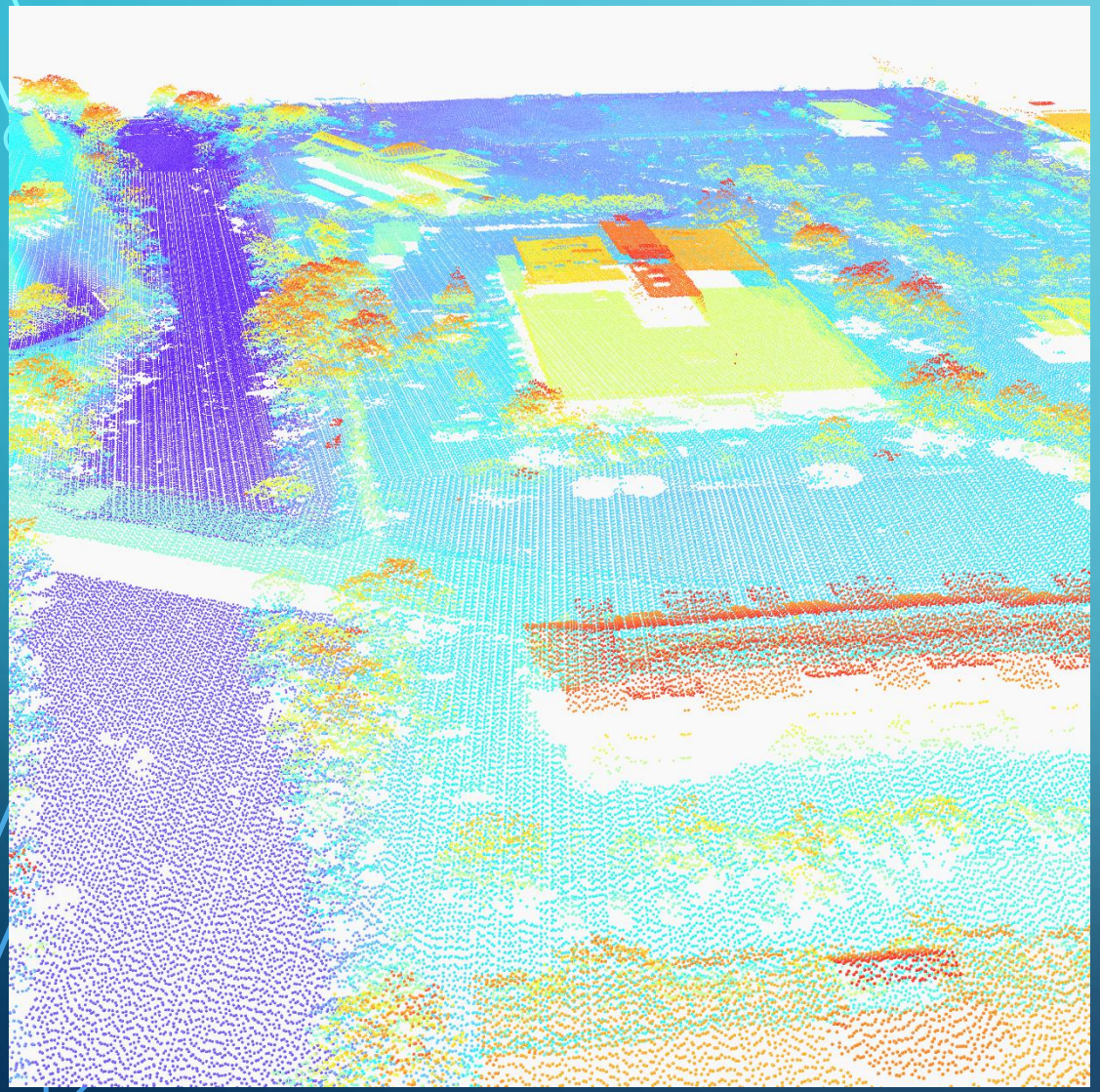
VISUALIZING POINT CLOUDS

- **Elevation**
- **Intensity**
- **Elevation modulated by Intensity**
- **Classification**
- **RGB (requires additional post-processing)**

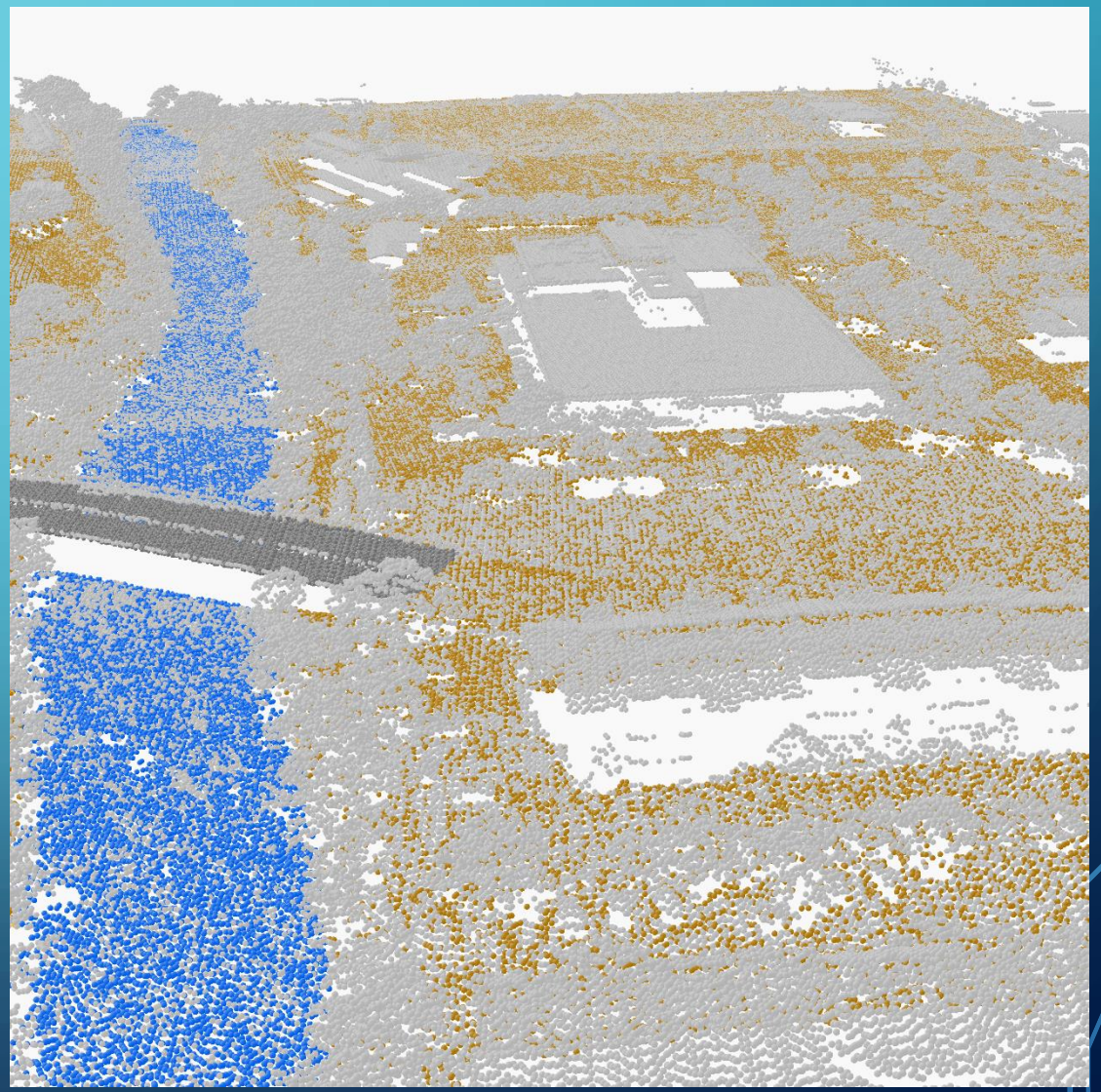
Live Examples

POINT CLOUD

ELEVATION

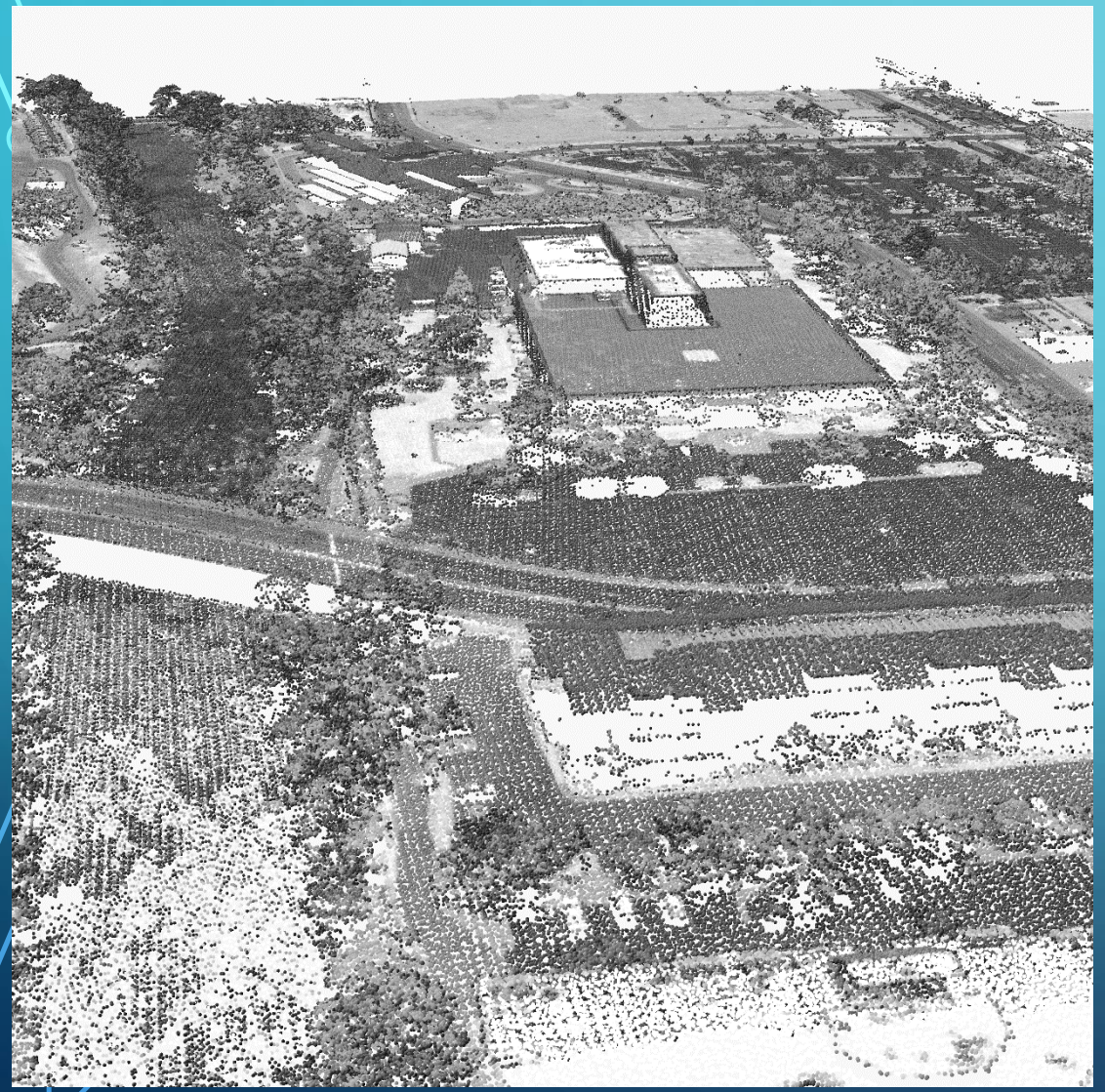


CLASSIFIED

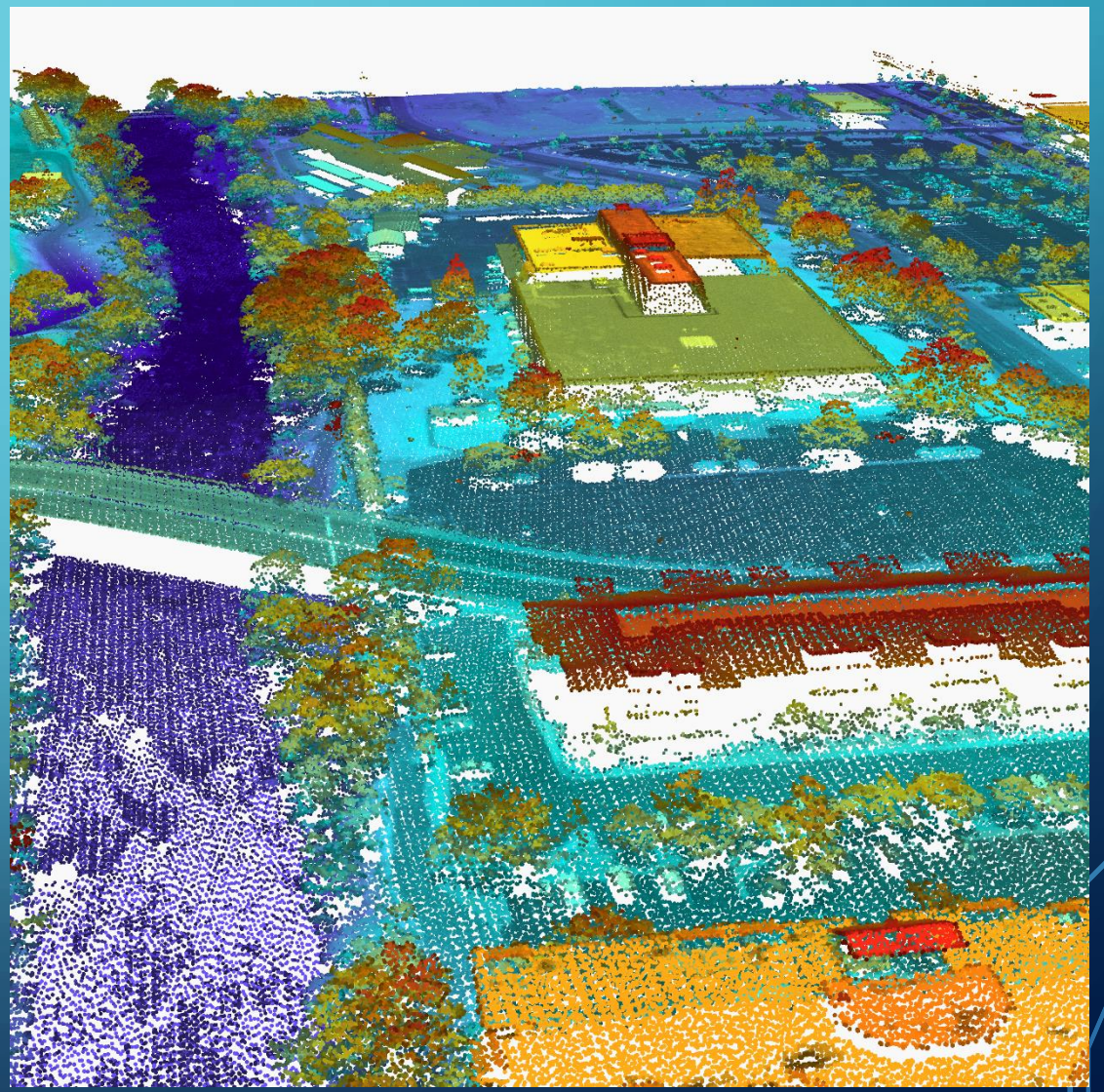


POINT CLOUD

INTENSITY

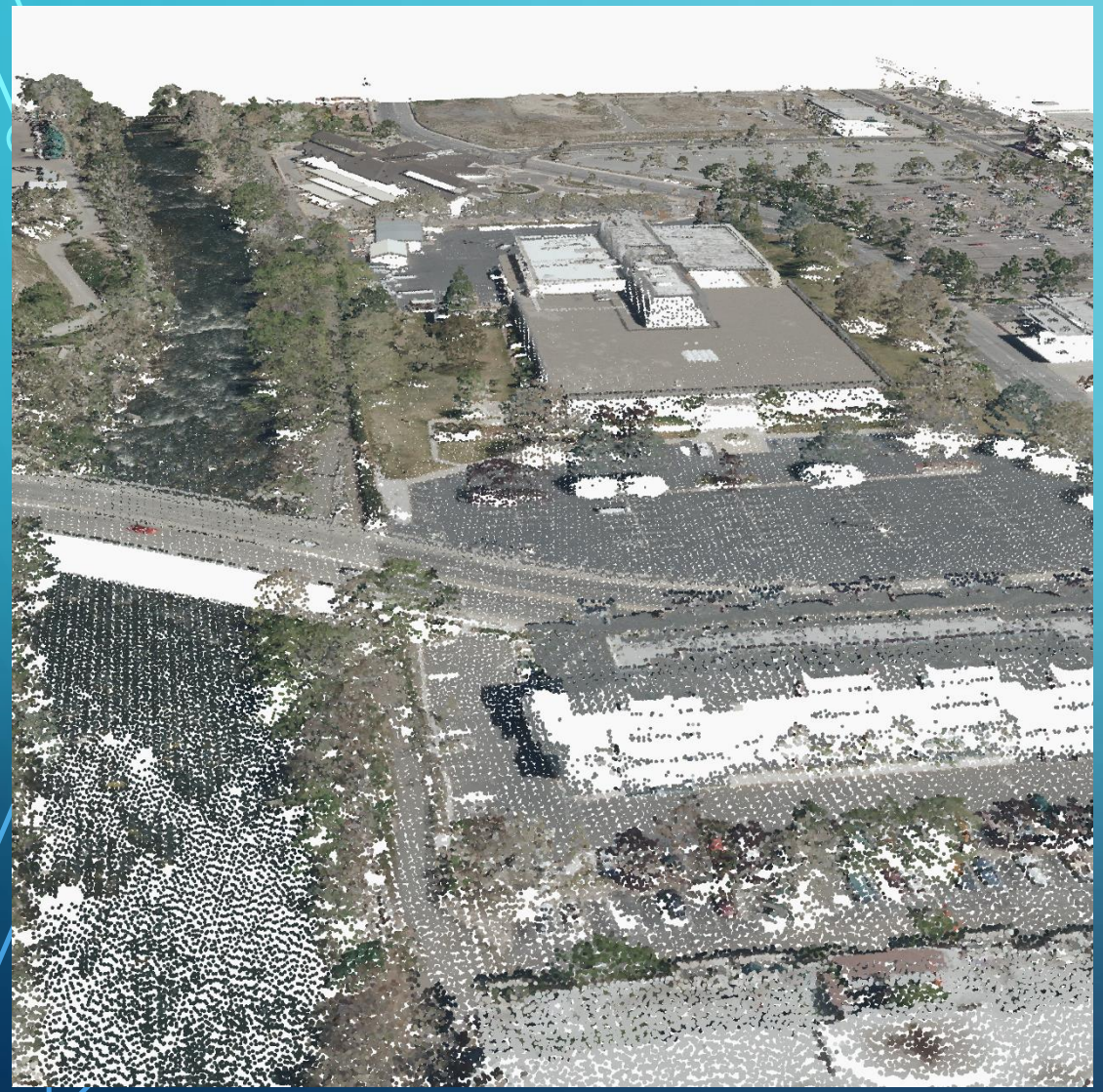


ELEVATION MODULATED BY INTENSITY



POINT CLOUD

PAINTED WITH RGB FROM WASHOE COUNTY AERIAL PHOTO



NOT A DELIVERABLE

Requires additional post-processing of the LAS file.

DEMS AND BREAKLINES

DEMs

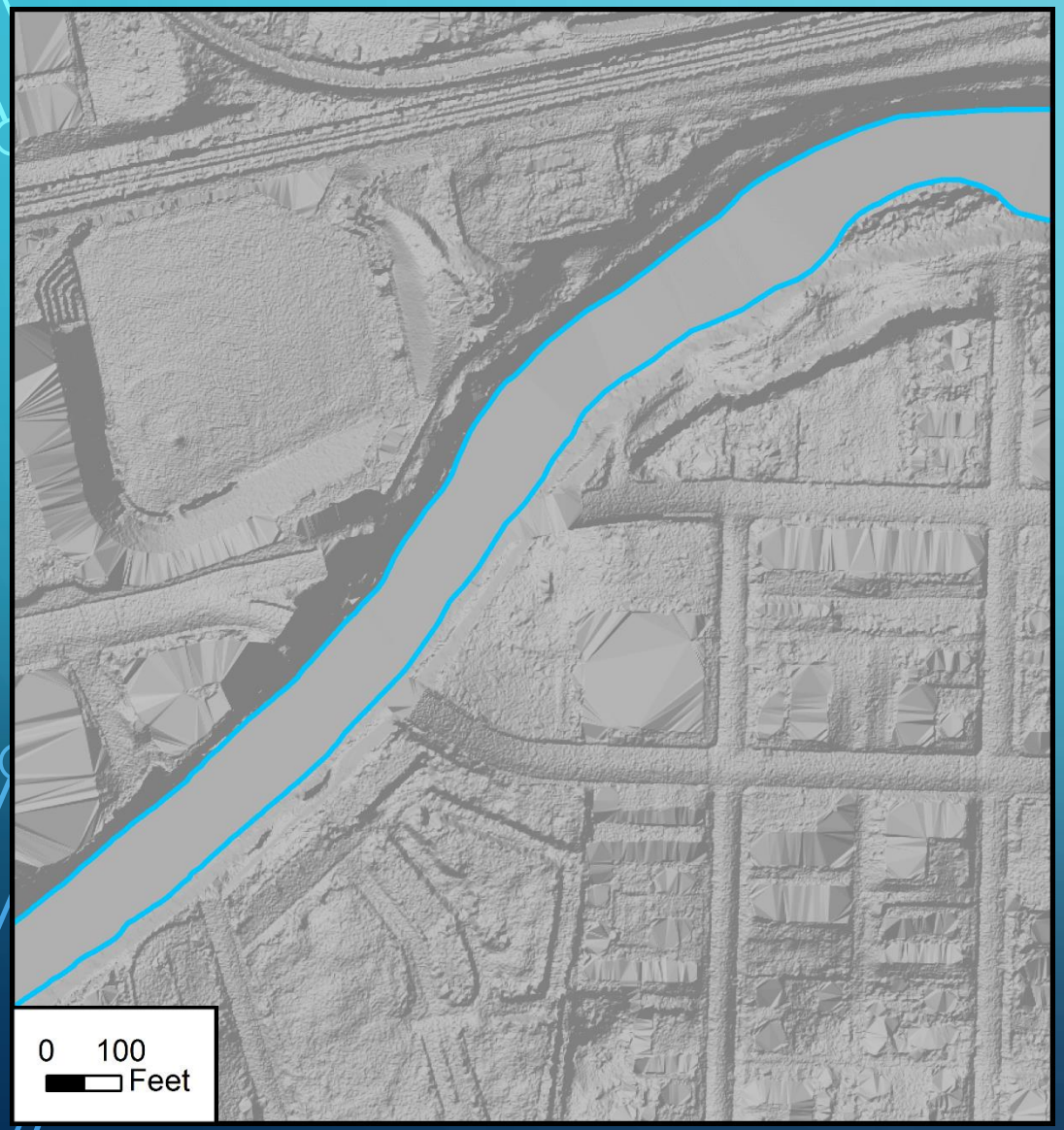
- **QL1 cell size = 0.5 m resolution**
- **QL2 cell size = 1.0 m resolution**

Breaklines

- **Rivers, Streams, Lakes, Ponds**

Live Examples

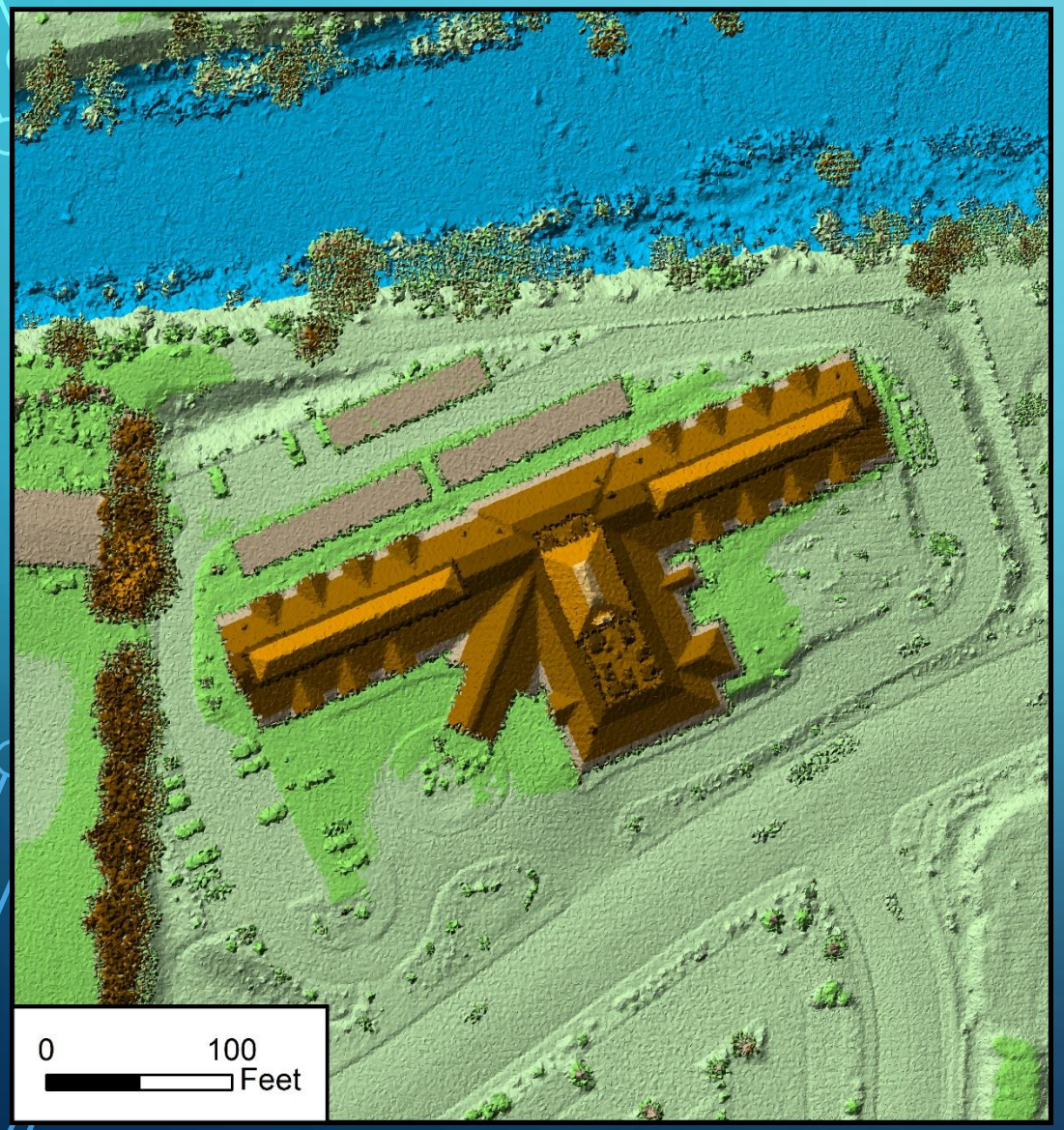
BARE EARTH DEM – ACE'S BALL FIELD QL1

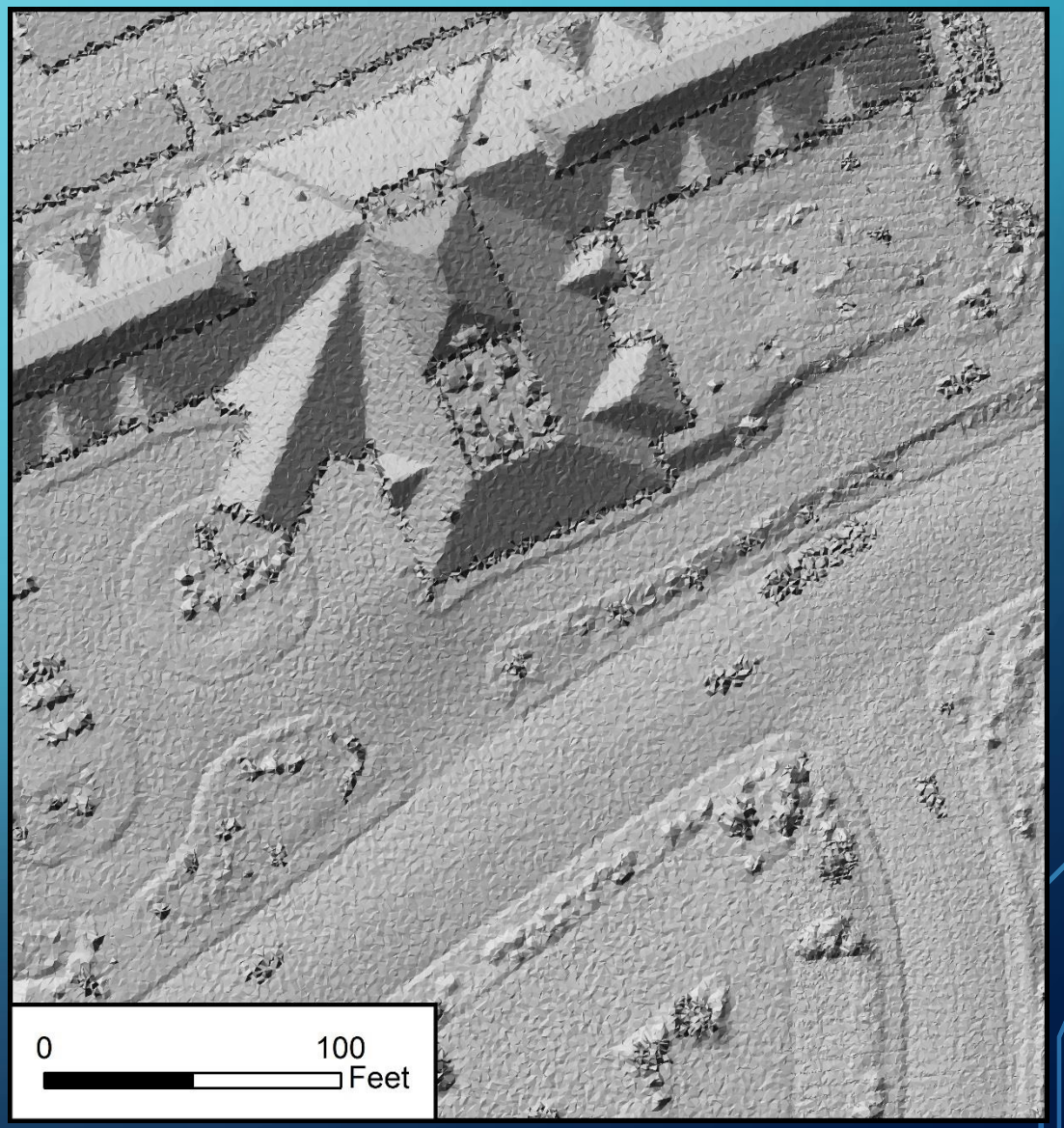


BARE EARTH DEM, 1-80 AND KEYSTONE QL1

TIN (NOT A DELIVERABLE)

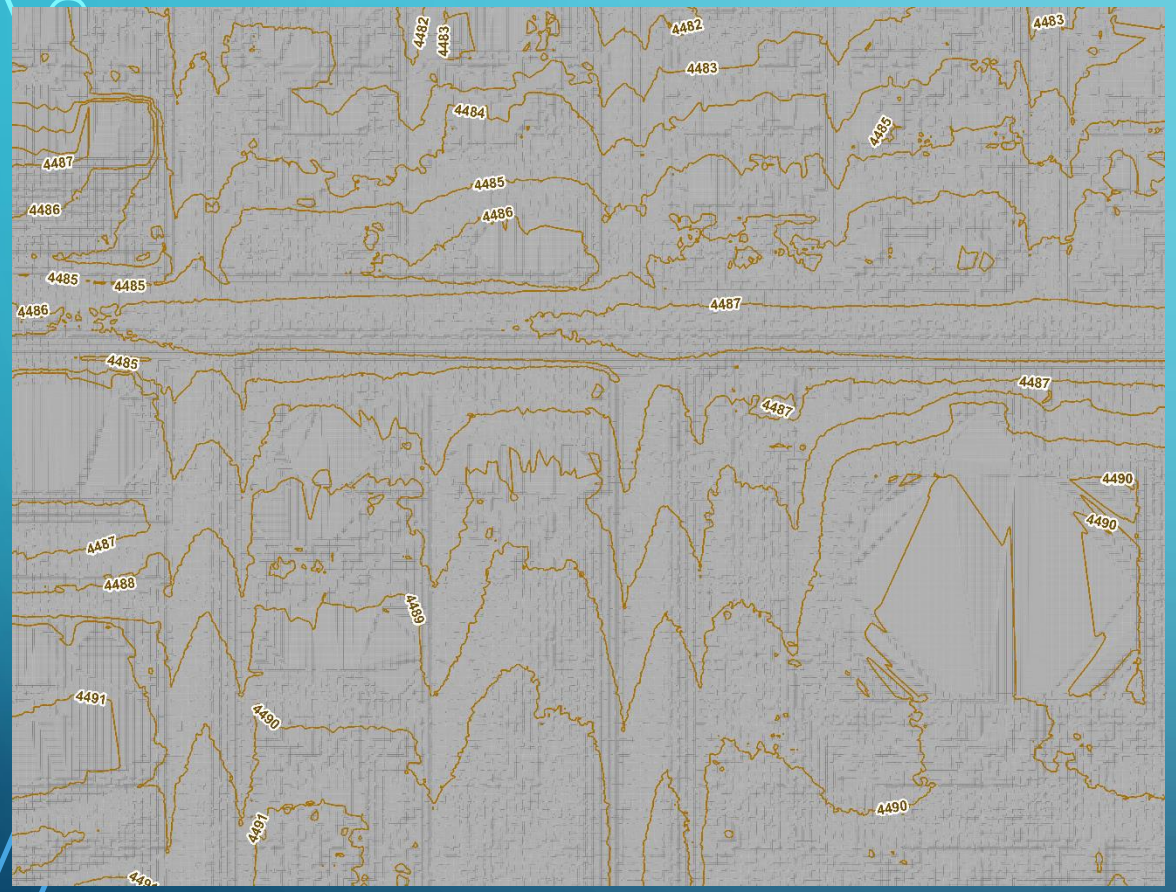
QL1



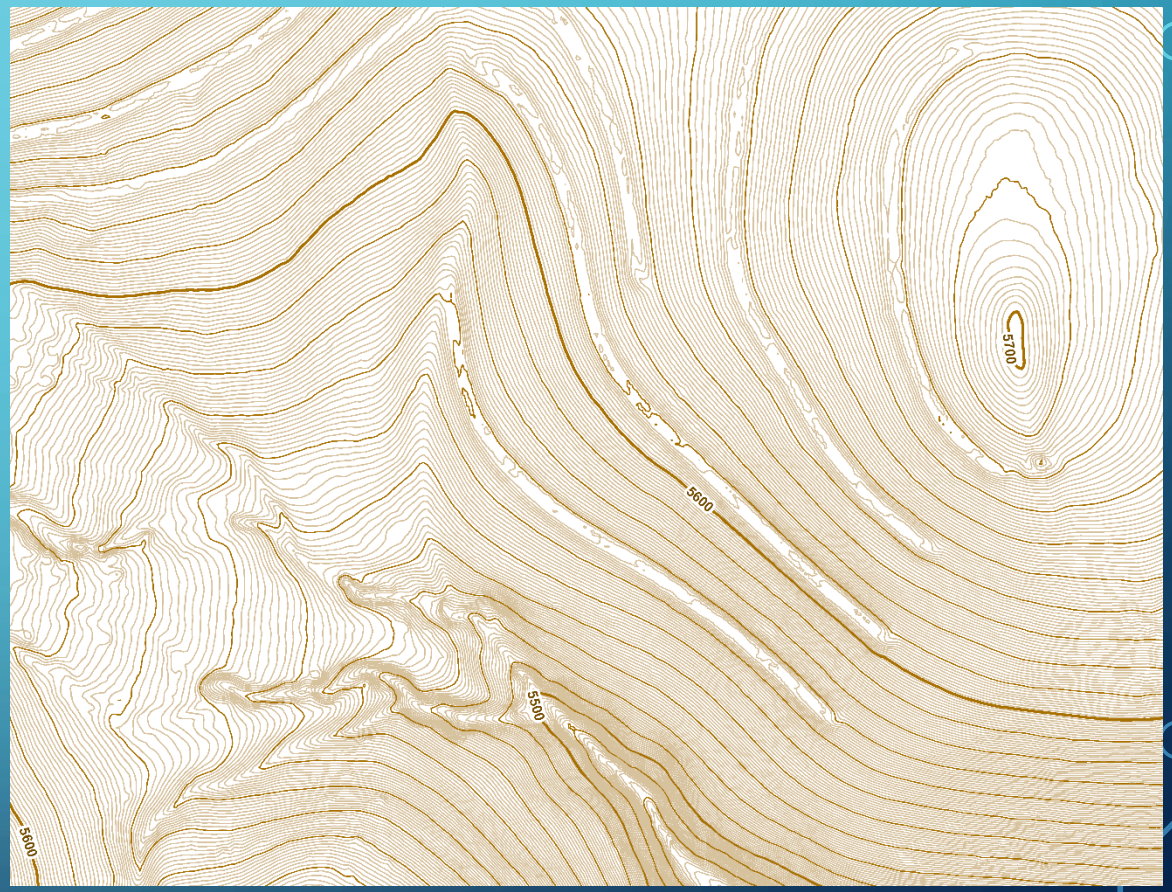


1 FT CONTOURS (NOT A DELIVERABLE)

QL1



QL2



DELIVERY SCHEDULE

- All products from vendor to USGS no later than March 31st.
- USGS final review.
- Final deliverables to USGS no later than May31st.

DERIVATIVE PRODUCTS & ANALYSIS

Potential Work to be Done

- LAS files, breaklines, and DEMs re-projected in NV State Plane. Grid and/or Ground?
- Add RGB values to LAS from orthophotos
- Create Contours
- Hydrobasin boundary refinement
- Capture tall building roof elevations
- Extract 3D buildings
  - Urban planning/Streetscape modeling
  - Event planning/Tactical response/line of sight
  - Rooftop solar power evaluation