“No Sediment Augmentation” Monitoring Plan

October 2024

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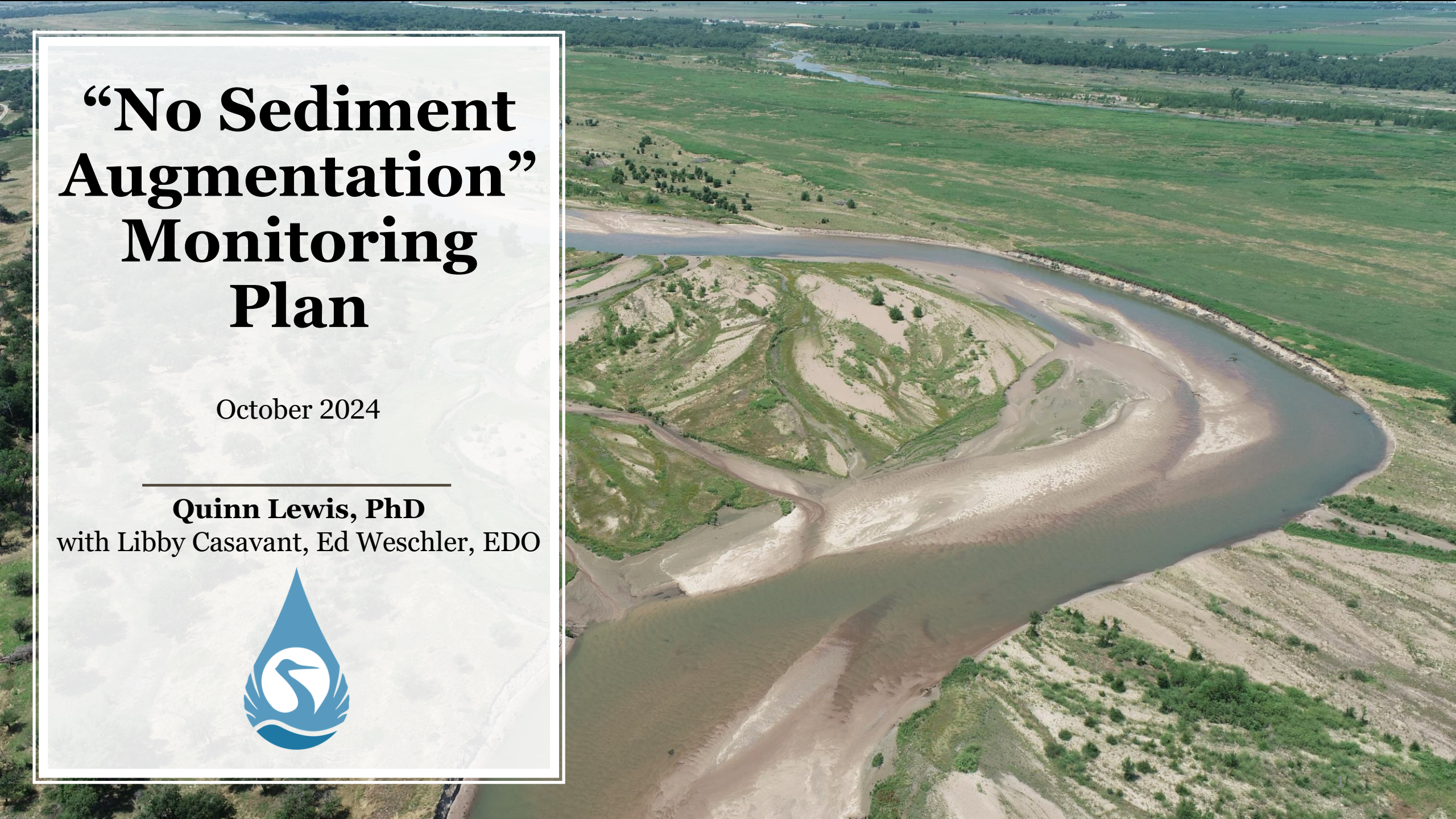
with Libby Casavant, Ed Weschler, EDO



Presentation Structure

1. No Sediment Augmentation monitoring plan – summary of changes, current status, motion for approval.

2. Discussion of 2022 – 2023 channel change data, key metrics. **What we learned** from system-wide lidar data.

3. Brief check-in on **what we did** for July 2024 supplemental No Aug field work (early returns on the No Aug Plan).

No Augmentation Purpose & Timeline

- Primary goal: is sediment augmentation in J2 needed; is it effective?
  - Important to understand channel form **without** annual active input
  - Concurrently, identify problems and catch them early

- ~~May – TAC input on monitoring plan outline (1st Draft)~~
- ~~July – ISAC input on monitoring plan (**2nd Draft**)~~

- Now – present to TAC for approval, then December GC

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How Has the Monitoring Plan changed?

- From May to July – remove “action triggers” to a “check in early and annually” perspective, with metrics detailed in the document.

- From July to Now – TAC and ISAC comments were broad and more *theoretical.* For example, is the J2 Return Channel habitat or not?
  - These changes are more for moving forward, system-wide reports and less for specific changes to the No Augmentation Plan
  - Cosmetic changes to the plan document, for example clearing up syntax

Presentation Structure

1. No Sediment Augmentation monitoring plan – summary of changes, current status, motion for approval.

Questions, concerns, comments, actions?

Reporting on 2022 – 2023 channel changes, metrics

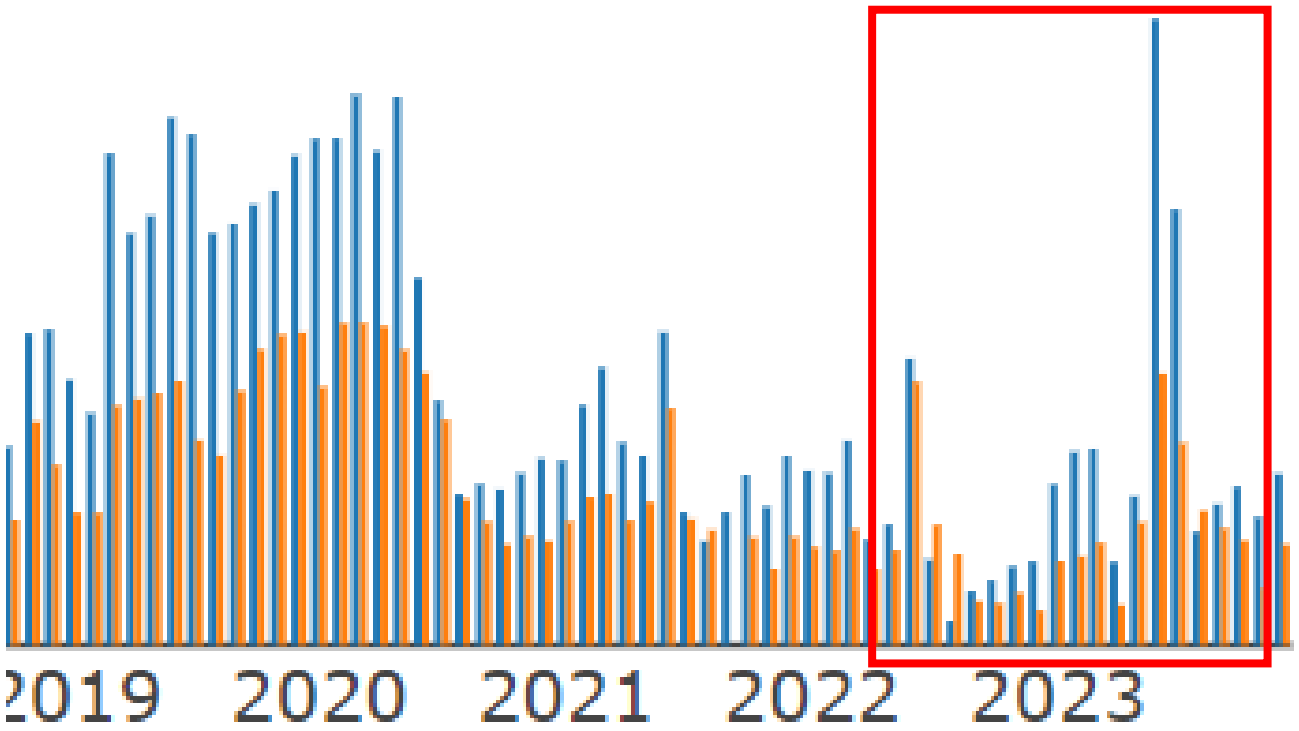
- The quick and easy – net erosion generally continues but less than previous years.
- Numbers, visual patterns suggest no new concerns related to conditions/benchmarks.
- Well-positioned to continue with the No Augmentation Experiment.

2022 – 2023 Flow Context

Reminder – lidar Nov. 2022 – 2023.

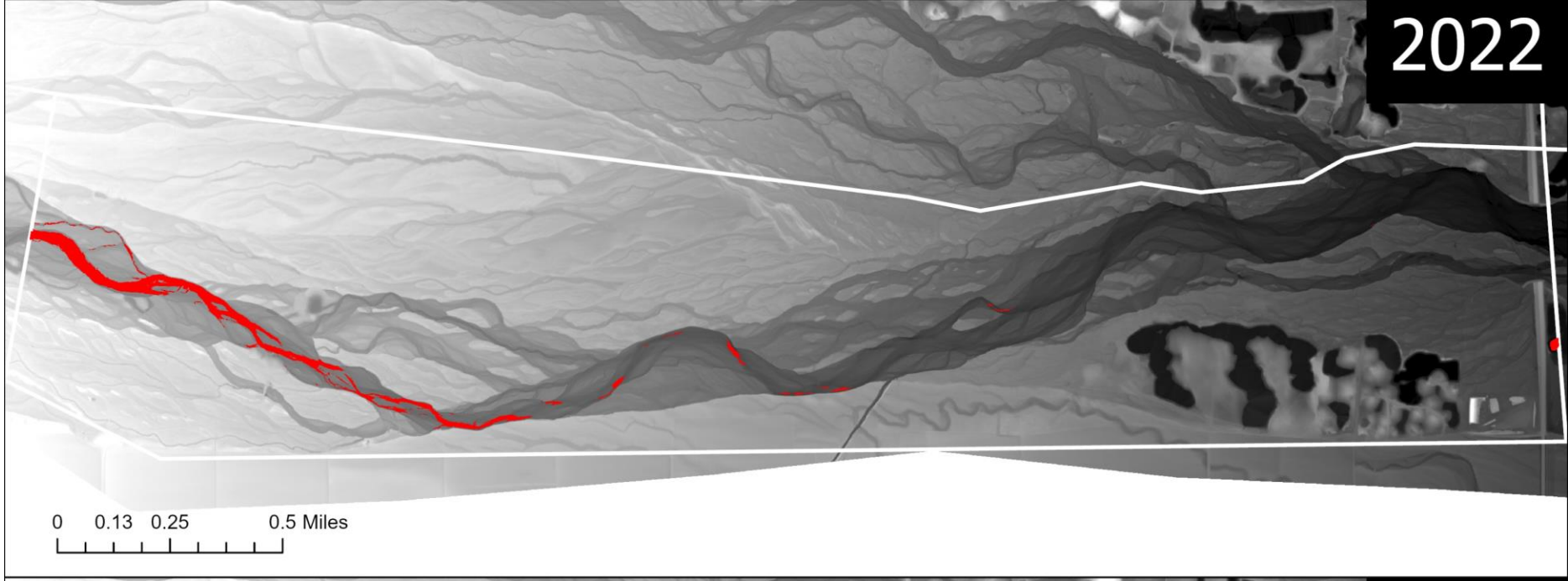
Summer 2023 had high flows, even activated (ungauged) breakthrough channel.

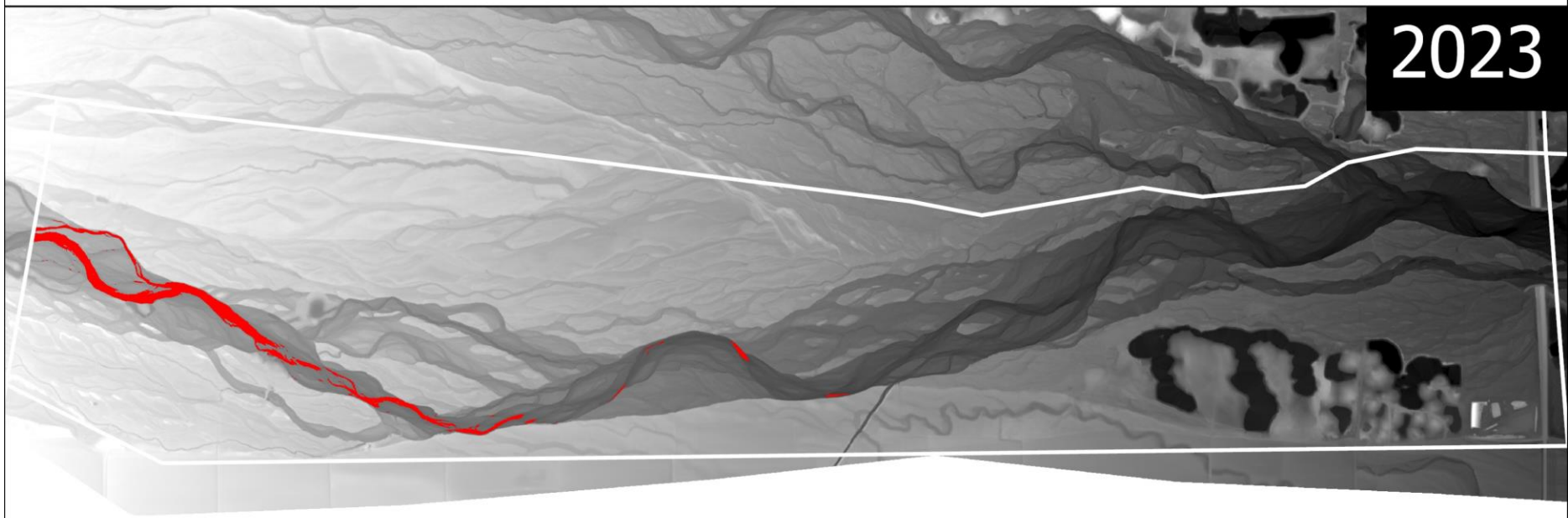
Overall higher flows than 2021-2022, but not as high as previous years.



9-ft depth (below datum) class

Very little change in this class in the pre-Overton J2 channel





2: 2022 – 2023 changes

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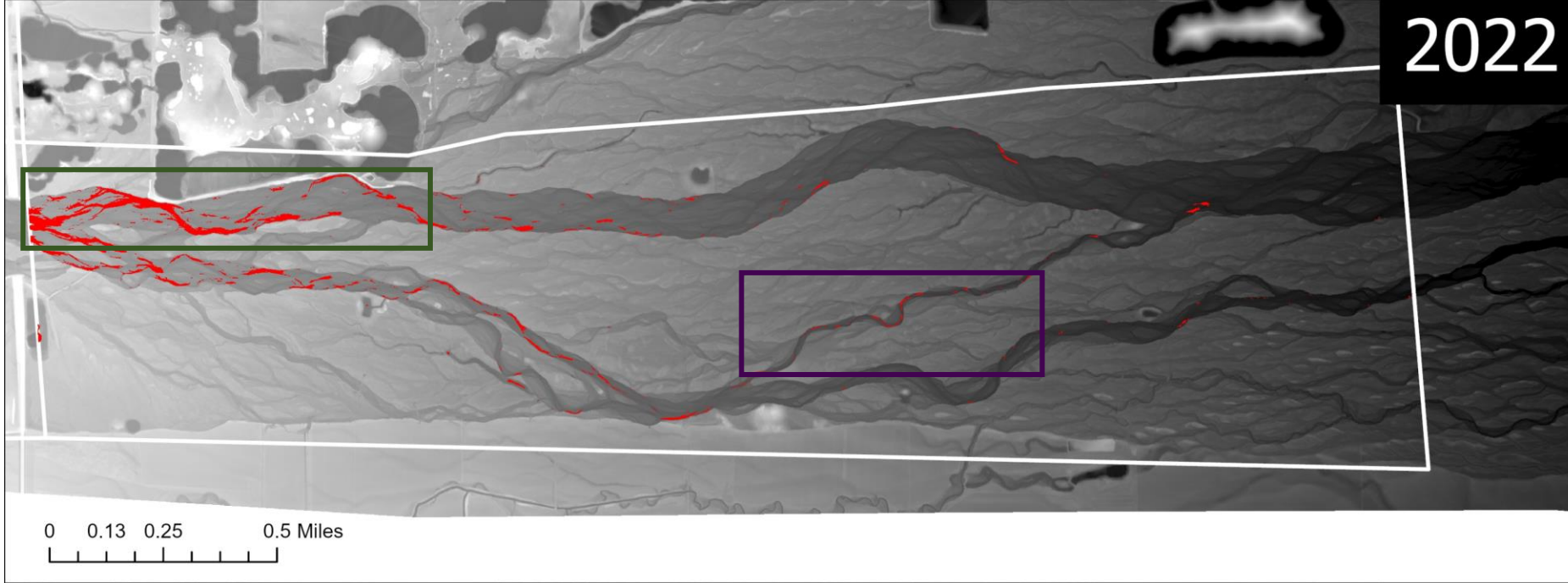
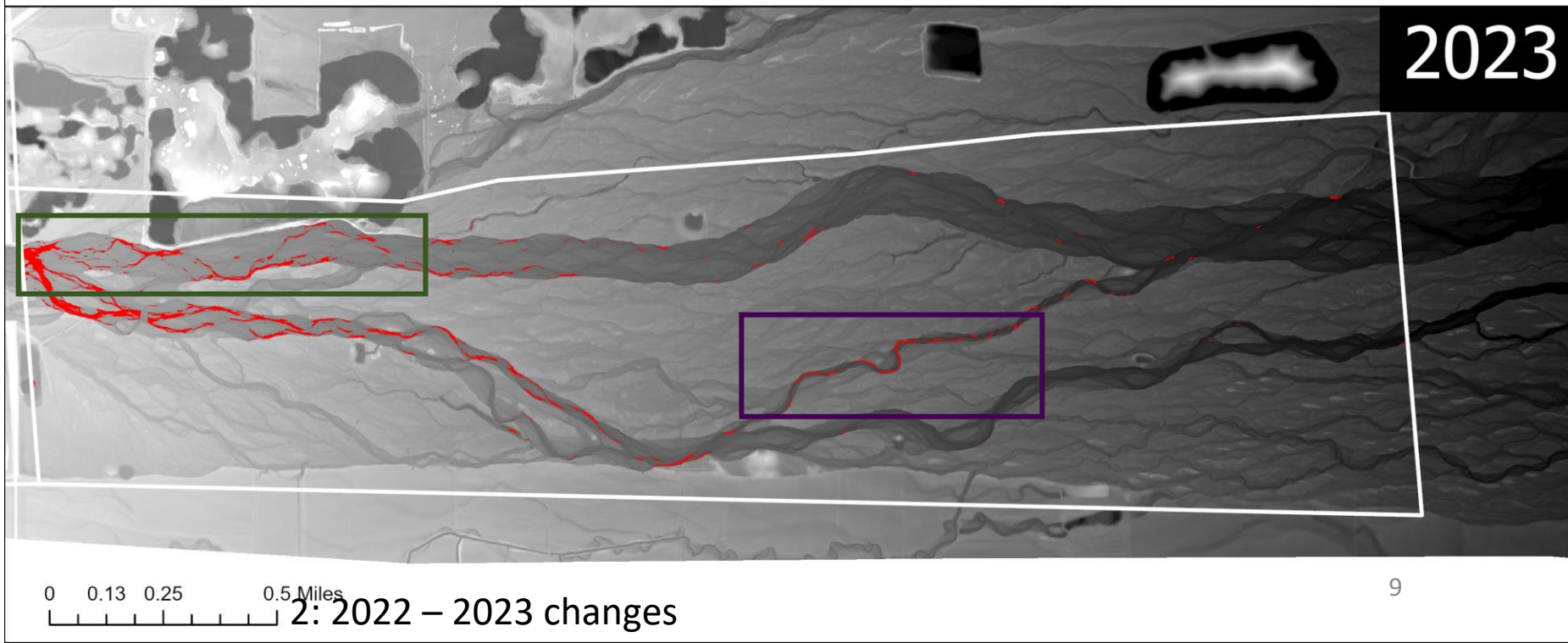
5-ft depth (below datum) class

No substantial *large-scale* change in pattern

Less extensive in post-Overton N channel

More extensive in post-Overton S channel





2: 2022 – 2023 changes

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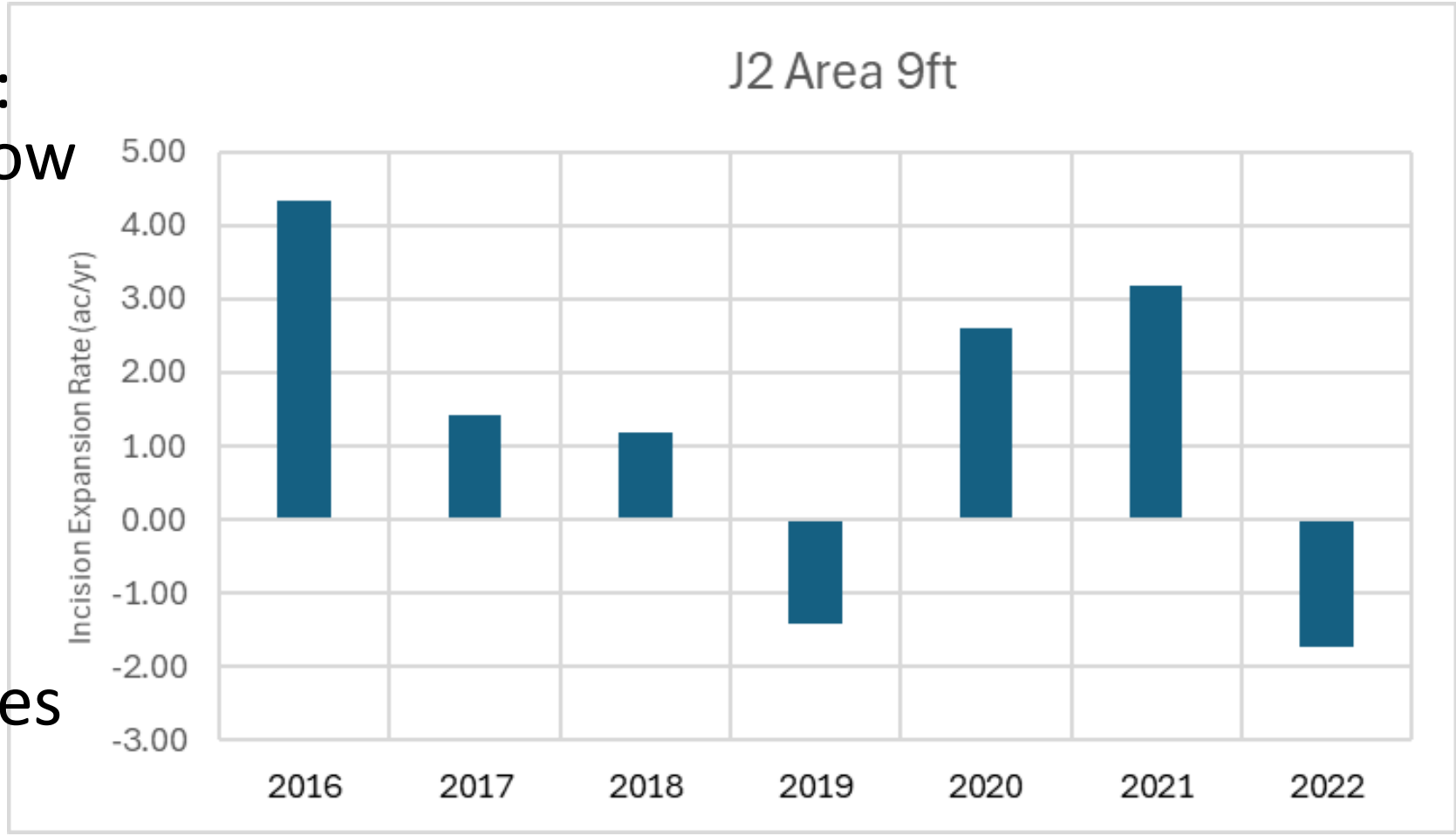
Volumetric and Areal Analysis

Incision Expansion Rate:
Δ total area of DEM below given depth class

DS of Overton, 5ft.

US of Overton, 9ft.

Total area in these classes lower this year.



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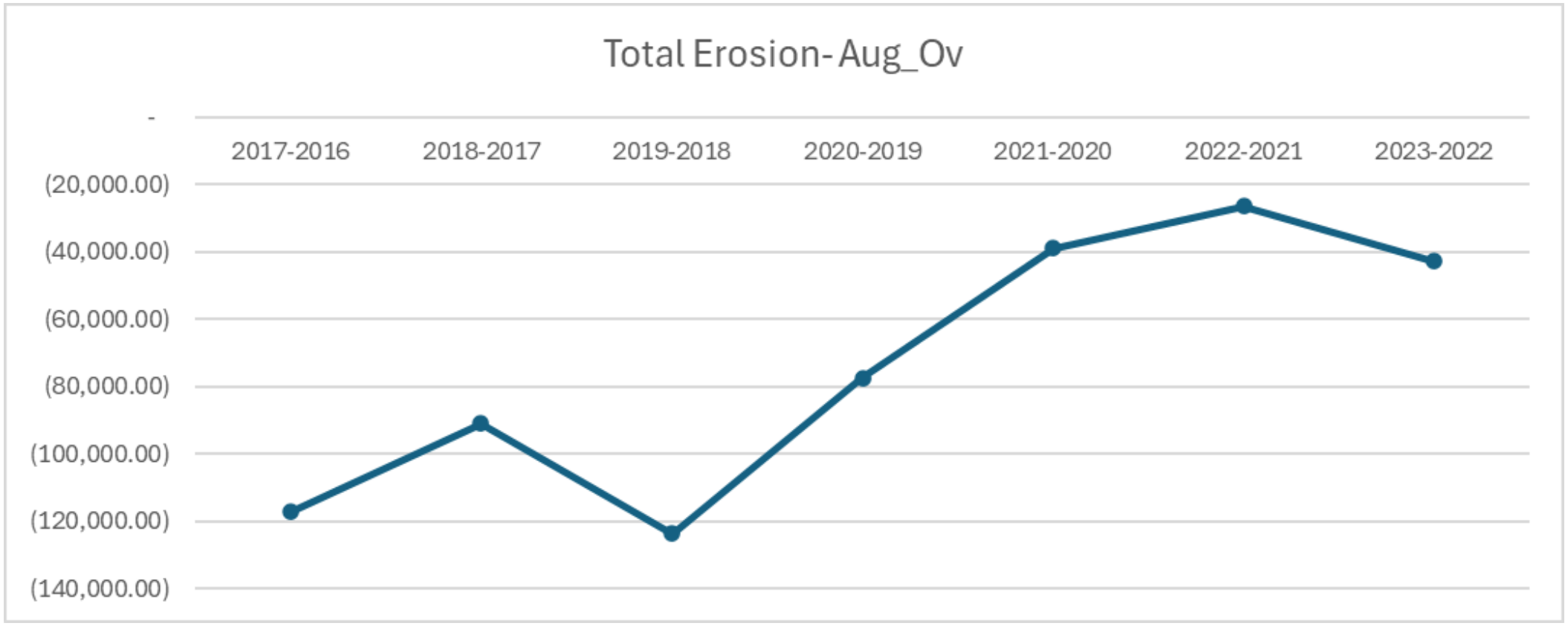
2: 2022 – 2023 changes

Volumetric and Areal Analysis



Total erosion DS of Overton slightly increasing but in line with past.

Total erosion US of Overton slightly increasing but in line with past.

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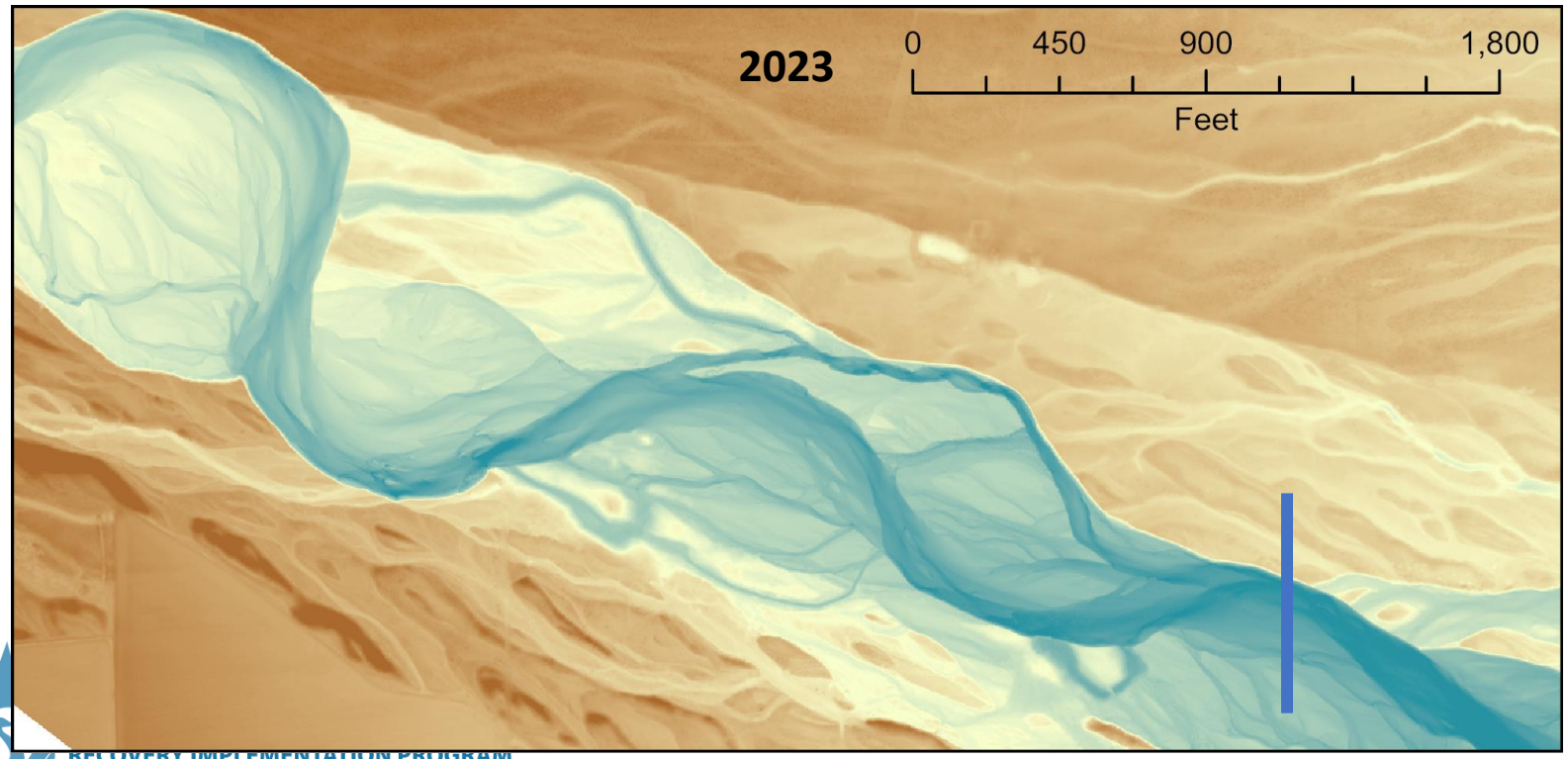
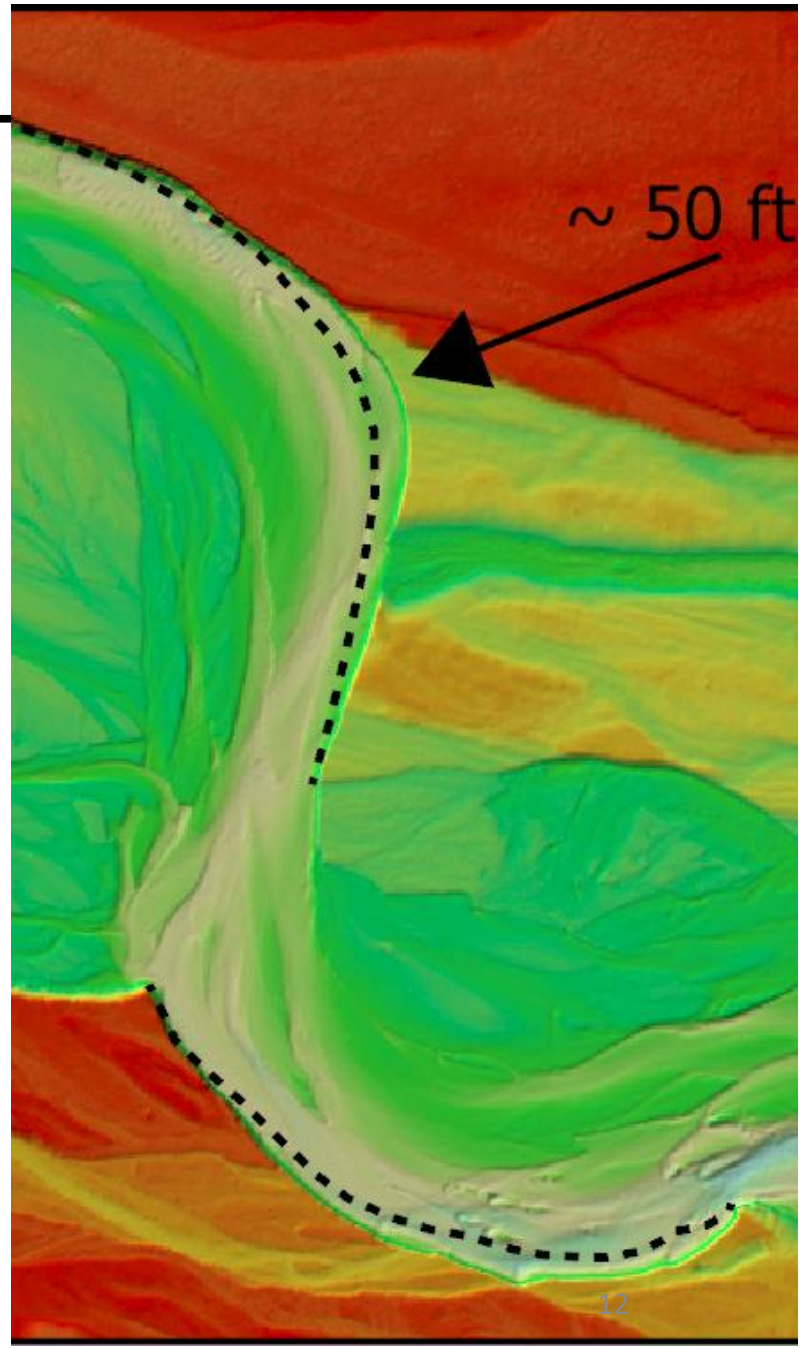
2: 2022 – 2023 changes

Planform, Station 70

No noticeable DS progression of planform transition point.

Meander translation/extension continues US of 70 K, max rate of about 50 ft/year. This is good!





2: 2022 – 2023 changes

Presentation Structure

2. Discussion of 2022 – 2023 channel change data, key metrics. **What we learned** from system-wide lidar data.

Questions, concerns, comments, actions?

New Data Collection – July 2024, Moving Forward

- a. USGS-operated stream gage at Dyer along J2 channel
- b. Stage logger in breakthrough channel
- c. Tri-annual cross section surveys at anchor points 33-36 and Station 70,000
- d. In-channel sediment sieve analysis sampling
- e. Aerial longitudinal bed sediment, armoring sampling
- f. High-resolution aerial imagery and 3D models

Brief updates on e & f today as they are the most “experimental”

New Data Collection- July 2024

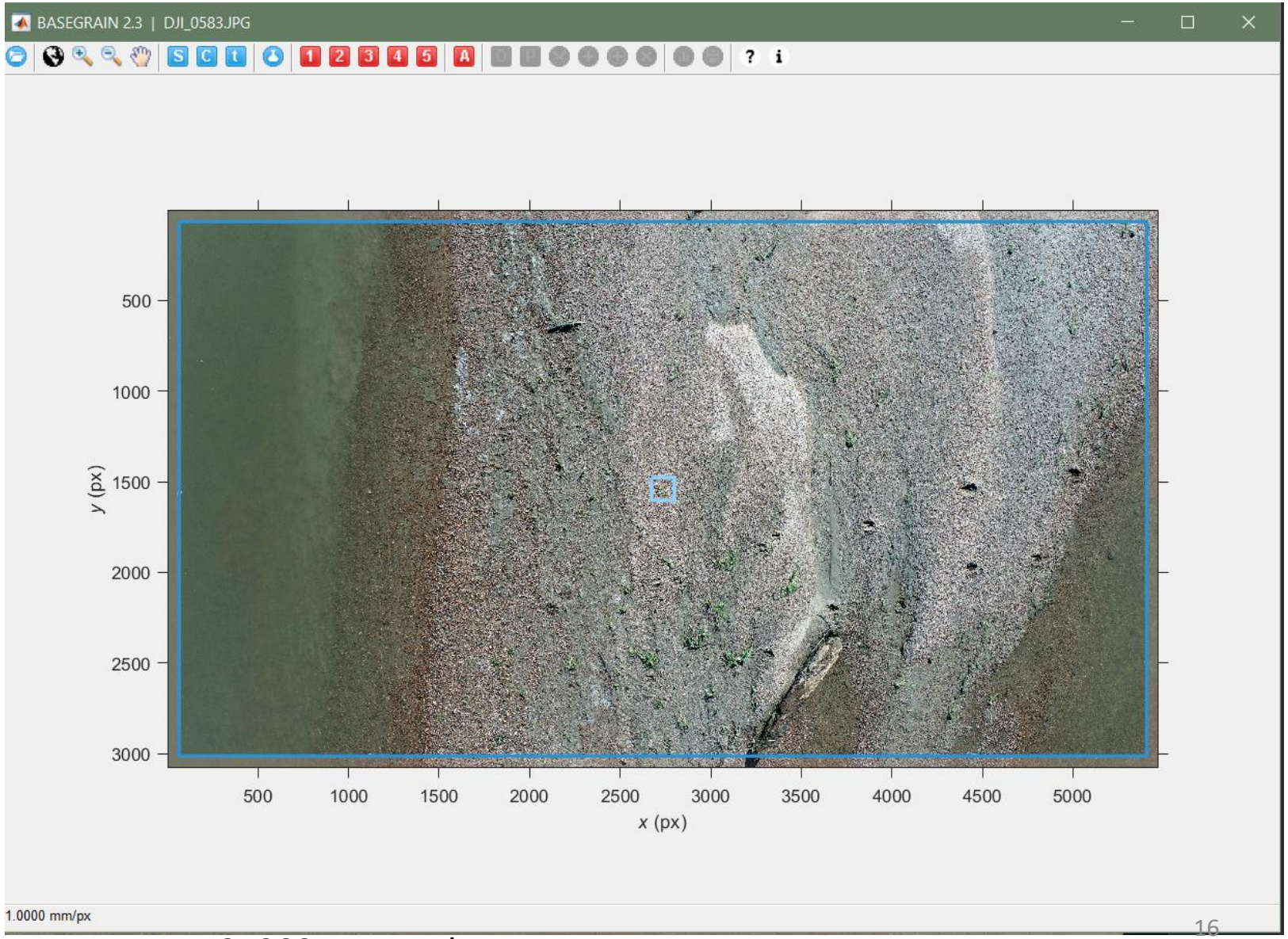
- Emphasis on collecting baseline for next 5 years, future system-wide report (still rely on yearly lidar/CIR for annual metric reporting)
- July 2024 supplemental work went well despite high flows
- Drone data was easy to fly, combined automated (sediment bars) and manual (eroding banks) flights – lots of low-hanging fruit.

- No changes planned
- Another visit in early November

New Data Collection – Drone Sediment Samples

Still exploring specific software – stand alone, Matlab, Python…

…but early results suggest some success at low flight levels and thus potential bar-wide sediment size distributions.



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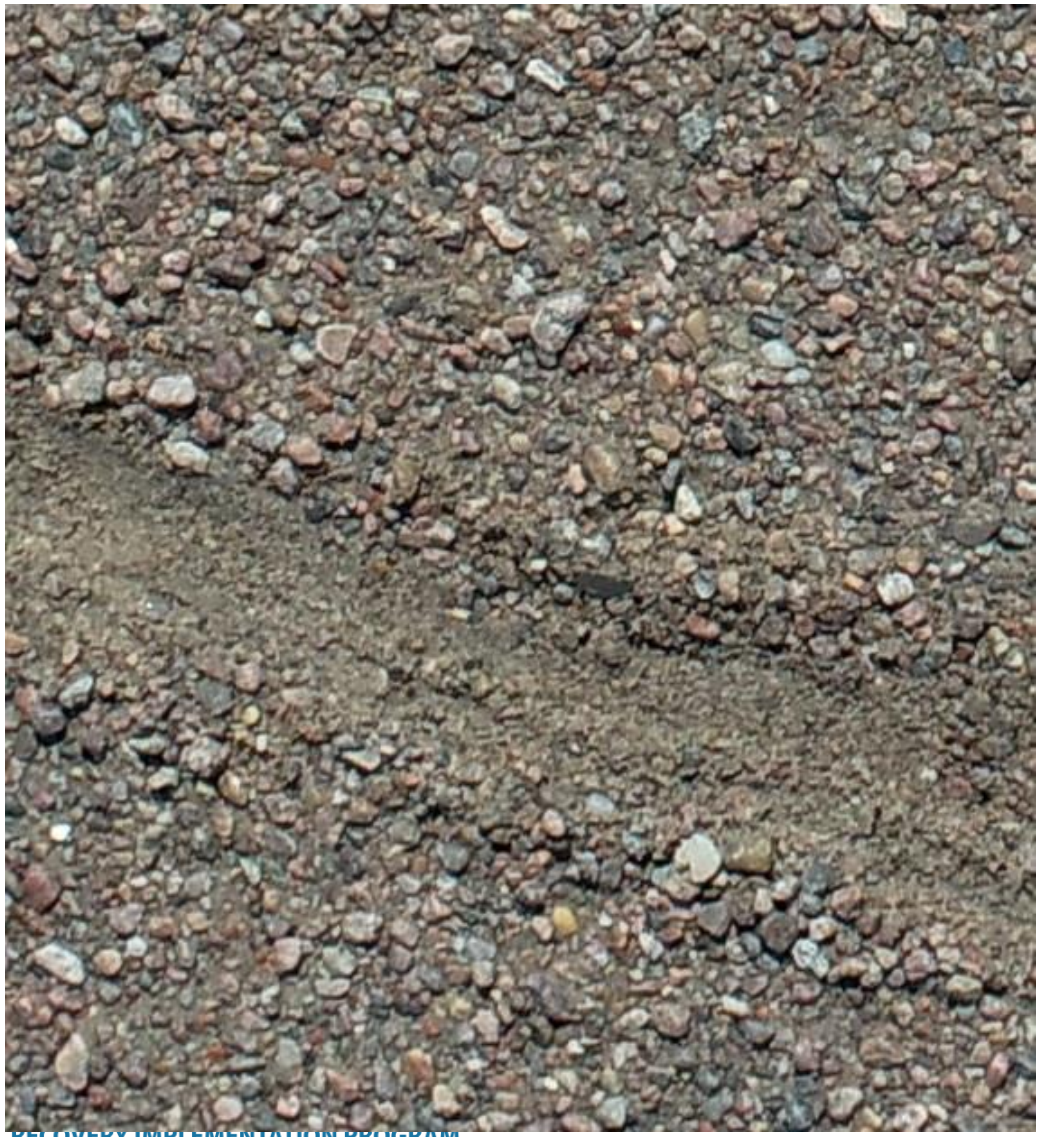
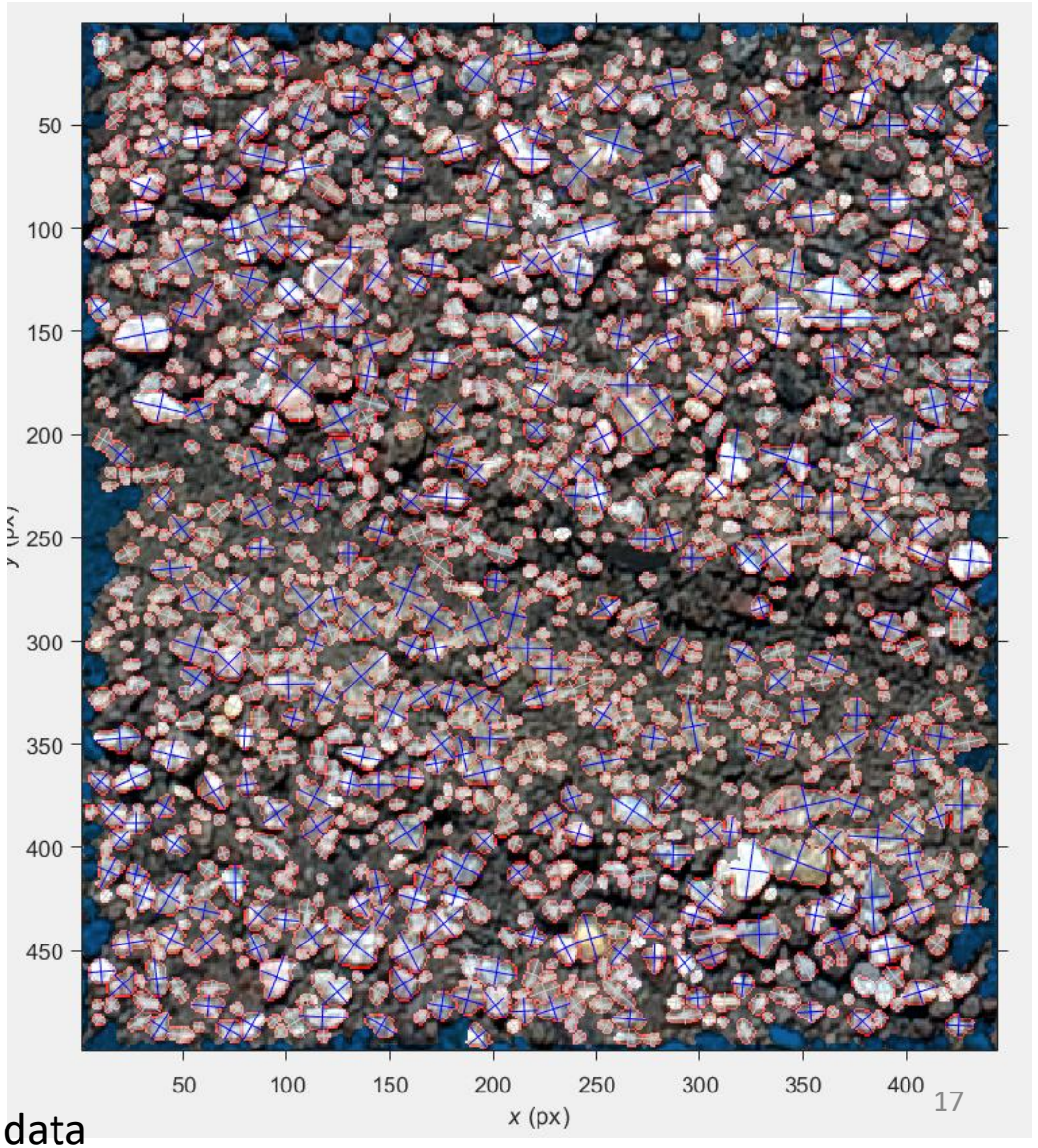
3: 2024+ new data

New Data Collection – Drone Sediment Samples

Automated results, no QA/QC – larger rocks picked up, high potential





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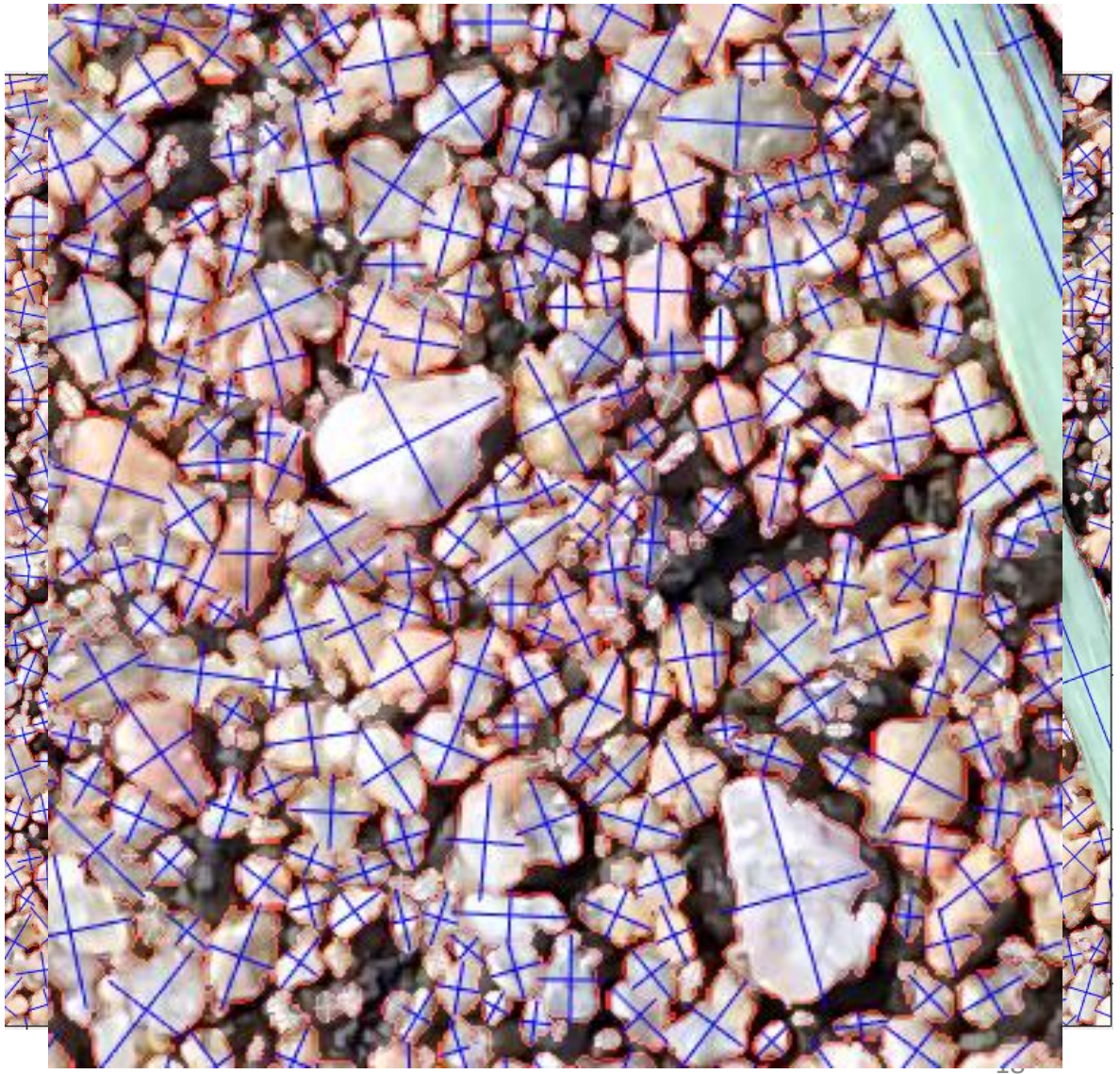
3: 2024+ new data

New Data Collection – Drone Sediment Samples

On-ground photos can do even better.



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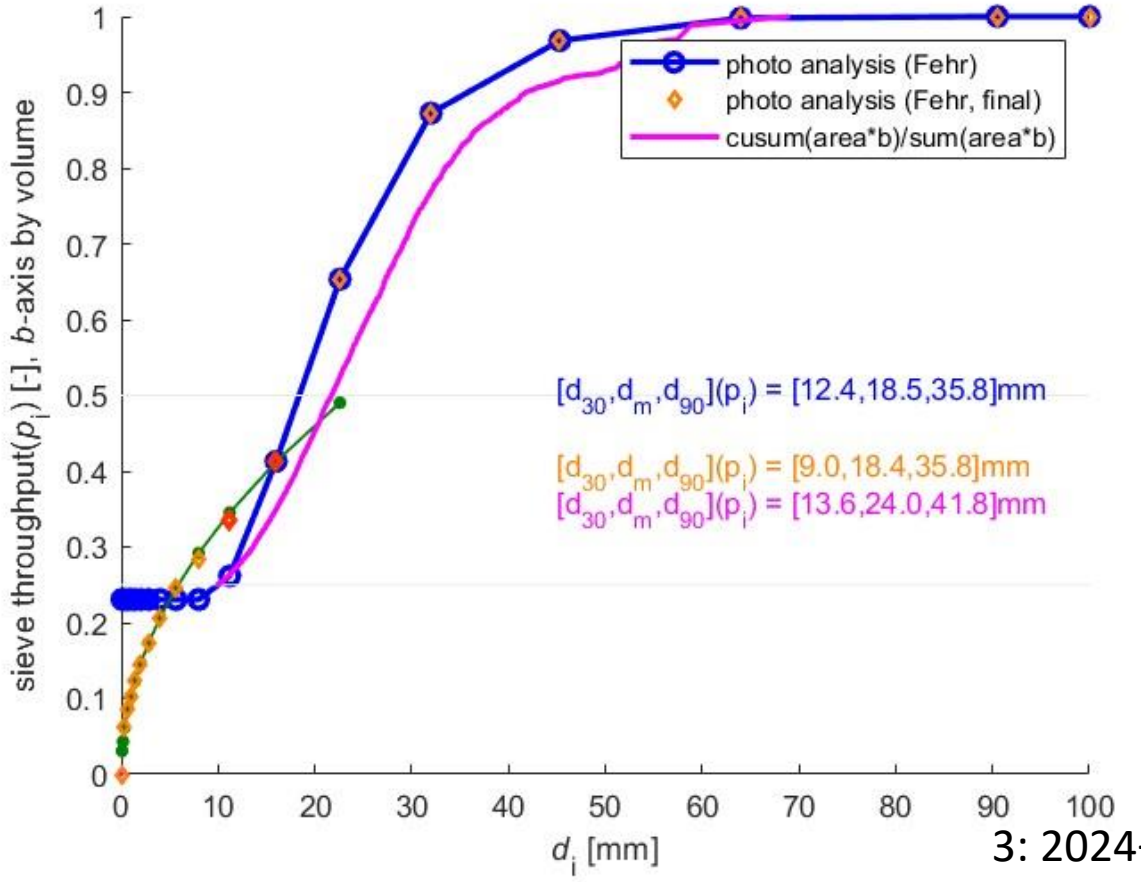
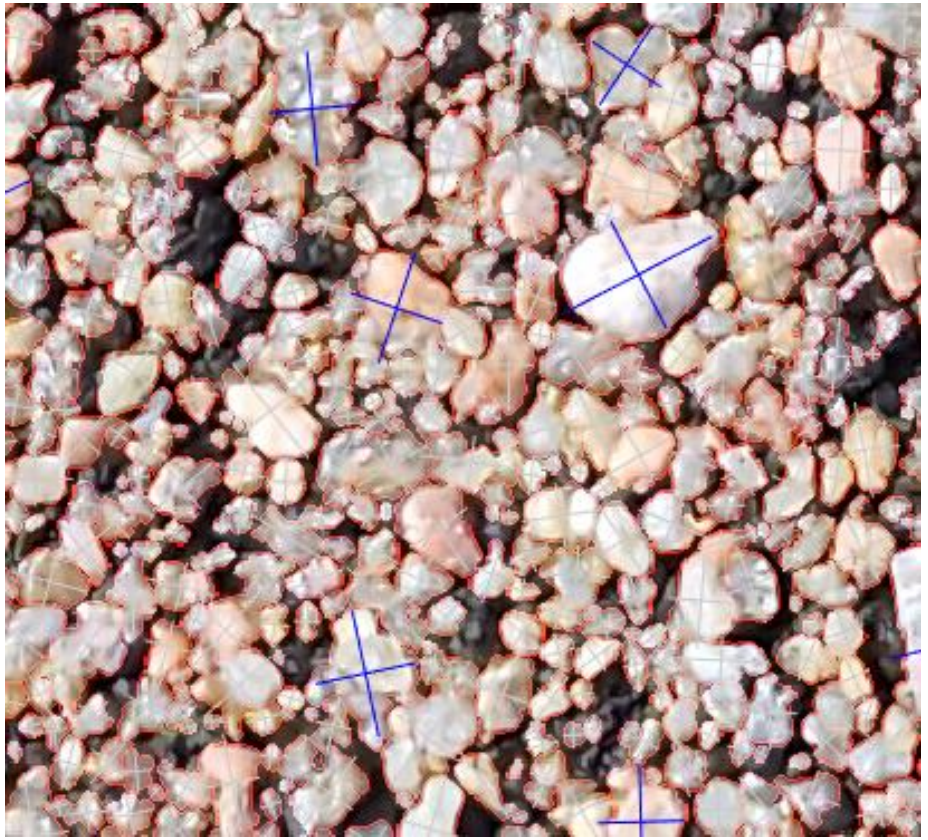
3: 2024+ new data

New Data Collection – Drone Sediment Samples

These tools can automatically georeference the data (since it has GPS), produce maps, grain size plots…

…with more field method, software fine-tuning this is promising



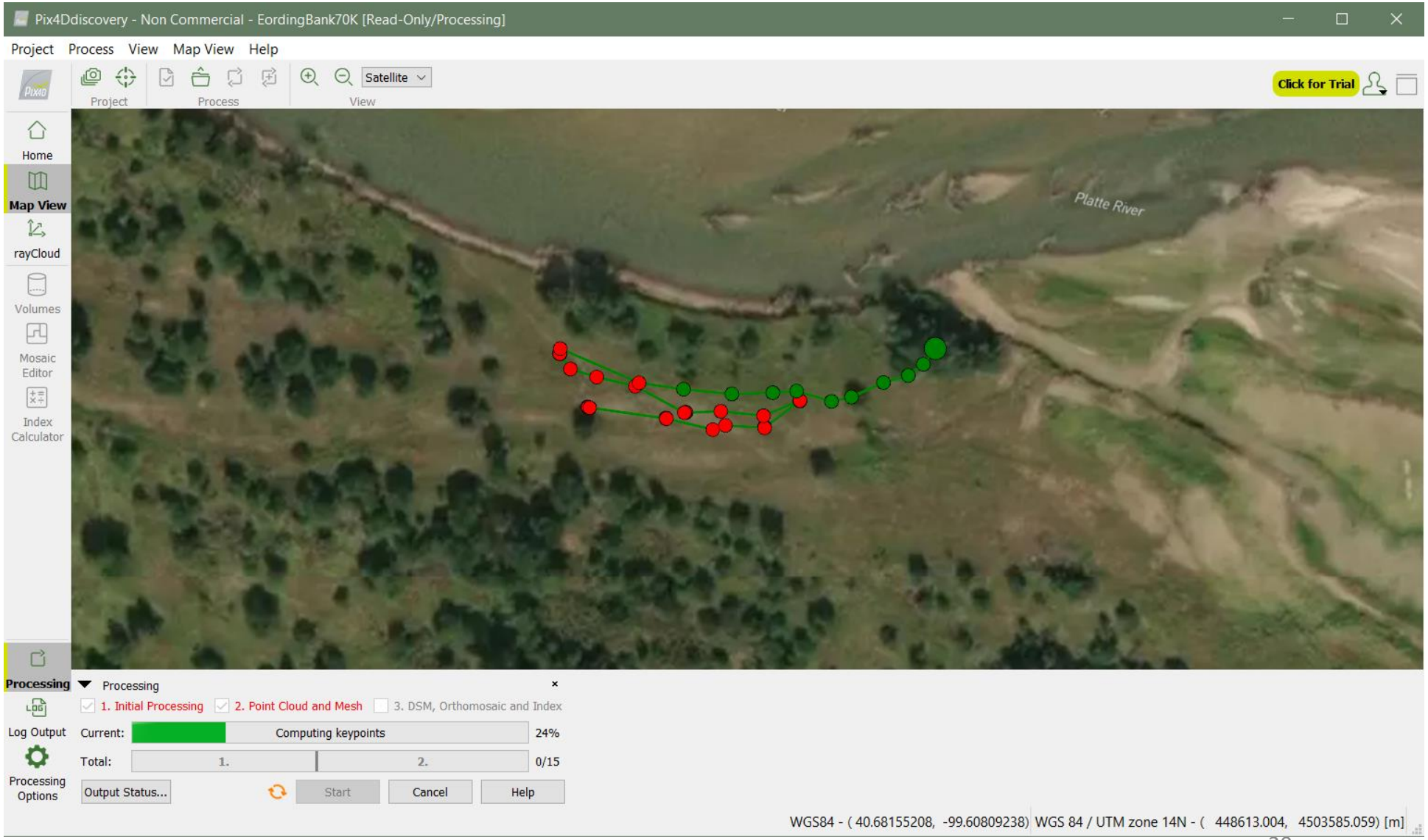


3: 2024+ new data

New Data Collection – Drone Imagery, Models

Forested bank near 70K used as example

Snapshot of data processing



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3: 2024+ new data

New Data Collection – Drone Imagery, Models

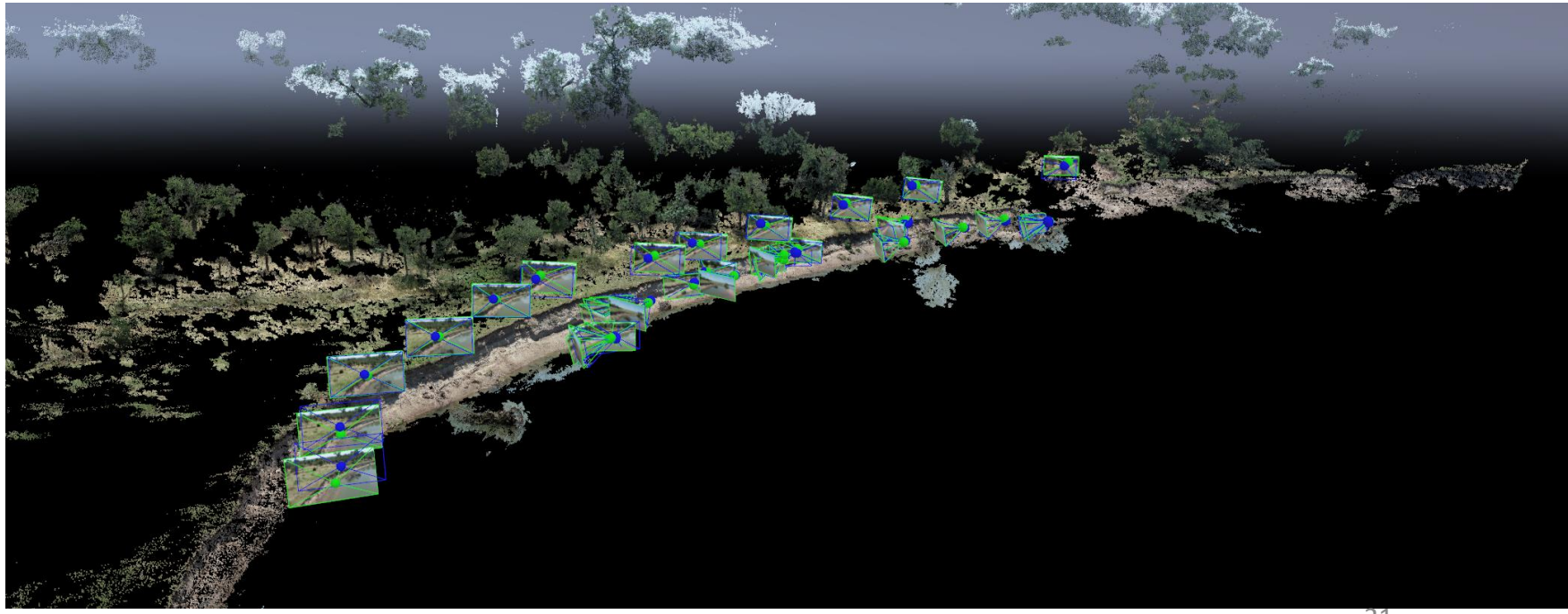
Very high resolution – 0.34 inch @ initial processing.

Produced pt cloud, orthophoto, DEM, DSM

Can measure change between July and November 2024

Summary

Project	EordingBank70K
Processed	2024-10-14 13:46:00
Camera Model Name(s)	FC6310S_8.8_5472x3078 (RGB)
Average Ground Sampling Distance (GSD)	0.87 cm / 0.34 in
Area Covered	0.048 km^2 / 4.7503 ha / 0.02 sq. mi. / 11.7444 acres
Time for Initial Processing (without report)	01m:57s



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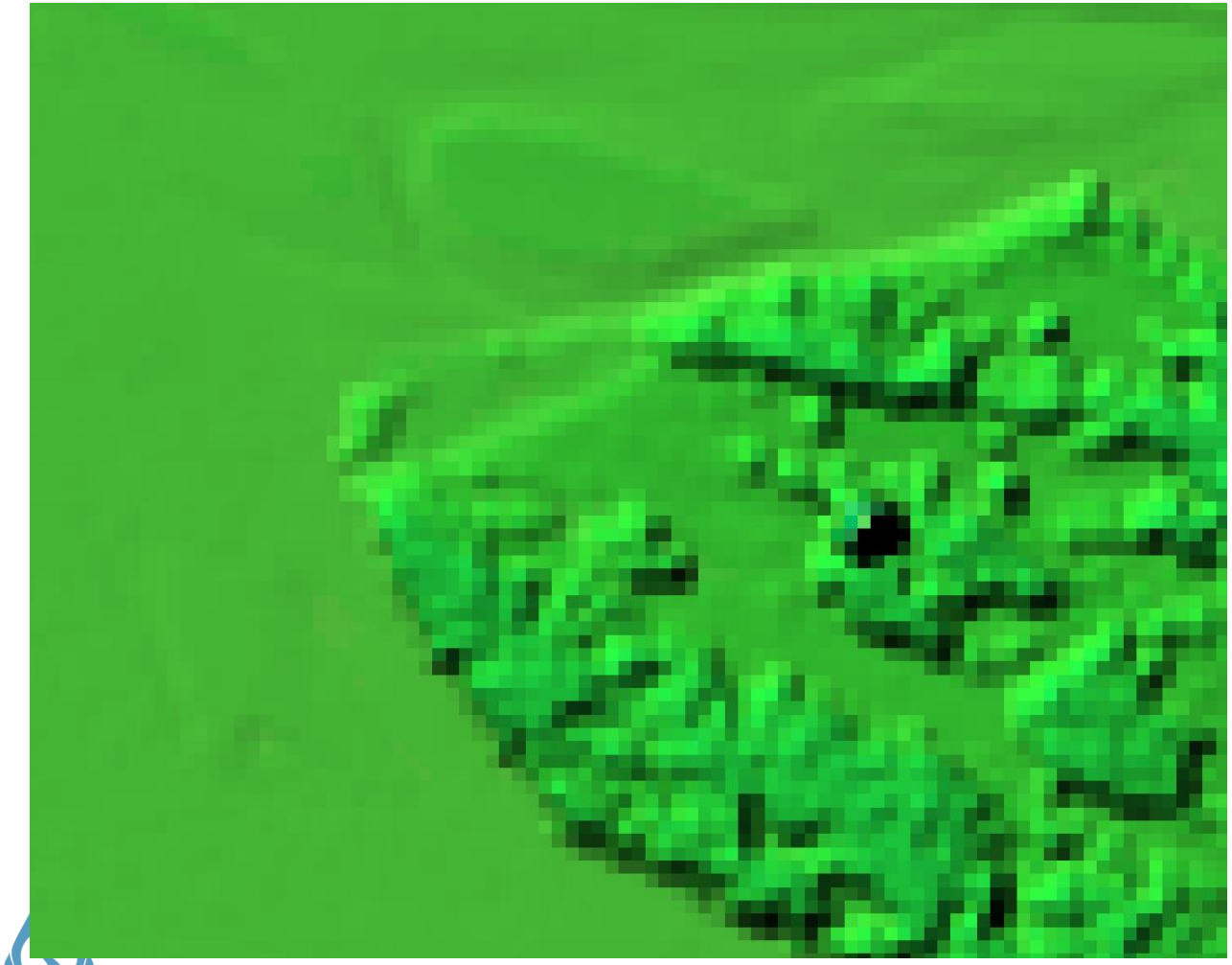
3: 2024+ new data

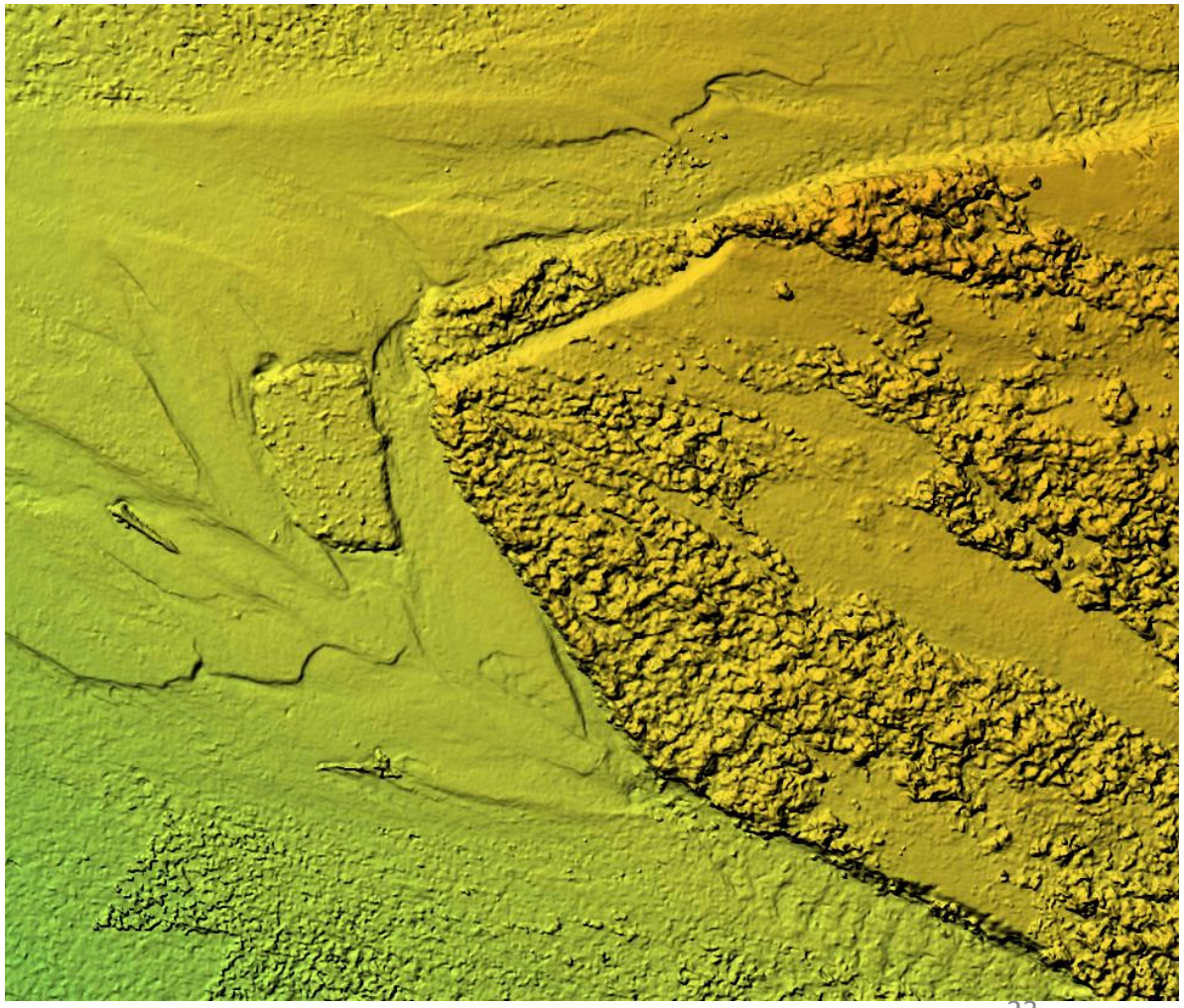
New Data Collection – Drone Imagery, Models

Nov 2023 RGB vs July 2024 drone orthophoto – 25X resolution

New Data Collection – Drone Imagery, Models

Nov 2023 lidar vs July 2024 drone DSM - ~100+ X resolution





3: 2024+ new data

New Data Collection – Drone Imagery, Models

Also obtained these 3D models, DEM, DSM, Ortho for:

- Exposed bars at anchor point locations (time variation, veg, sed. size)
- Unforested meander bend near Station 70K (comparing veg impact)
- Breakthrough channel gage location (model check?)

Lots of data to be used to interpret and understand changes between yearly lidar and at smaller scales (less than one inch)

Presentation Structure

3. Brief check-in on **what we did** for July 2024 supplemental No Aug field work (early returns on the No Aug Plan).

Questions, concerns, comments, actions?

Conclusion – Reporting and Communication

Timing – See Table 2.2.

- Heading back out to the field early next month, nothing major expected.

- If approved, moving forward with this timeline – this type of talk in Spring after we receive/process annual data, followed by written report.

Table 2.2. Proposed annual task breakdown of the no augmentation monitoring plan.

Month	Task(s)	Deliverable(s)
January	USGS – Overton, specific gage check (Section 5.2.c)	
February	USGS – Overton, specific gage check	
March (field work)	USGS – Overton, specific gage check Breakthrough gage, XS surveys, drone flights (Section 6)	
April	USGS – Overton, specific gage check Receive LiDAR, perform analysis (Section 5.2)	
May	USGS – Overton, specific gage check	Initial monitoring report to TAC – determine any changes to plan (Section 7)
June	USGS – Overton, specific gage check	
July (field work)	USGS – Overton, specific gage check Breakthrough gage, XS surveys, drone flights Sediment sampling (Section 6.d, 6.e)	Full monitoring report to TAC (Section 7)
August	USGS – Overton, specific gage check	
September	USGS – Overton, specific gage check Receive sediment sieve data	
October	USGS – Overton, specific gage check	
November (field work)	USGS – Overton, specific gage check Breakthrough gage, XS surveys, drone flights	
December	USGS – Overton, specific gage check	

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Thank you!