Single channel rivers in temperate regions: US Inland Water

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Calval data processing

"Toolbox"
PT level -> WSE
Flagging
Uncertainty calc.
'Drift match'
Area calc.

SWORD products
Reach WSE
Reach slope
Node WSE
Node Slope
Reach area

YOU ARE HERE

Coarse validation
Identify gross errors in SWOT
Identify gross errors in field data
Define conventions
Validate 'upstream' SWOT data
Kickoff SWOT algo changes

Fine validation
Assess SWOT performance

By validation meeting

GNSS processing
Remove interference
Limit to 5cm uncertainty

Collect field data

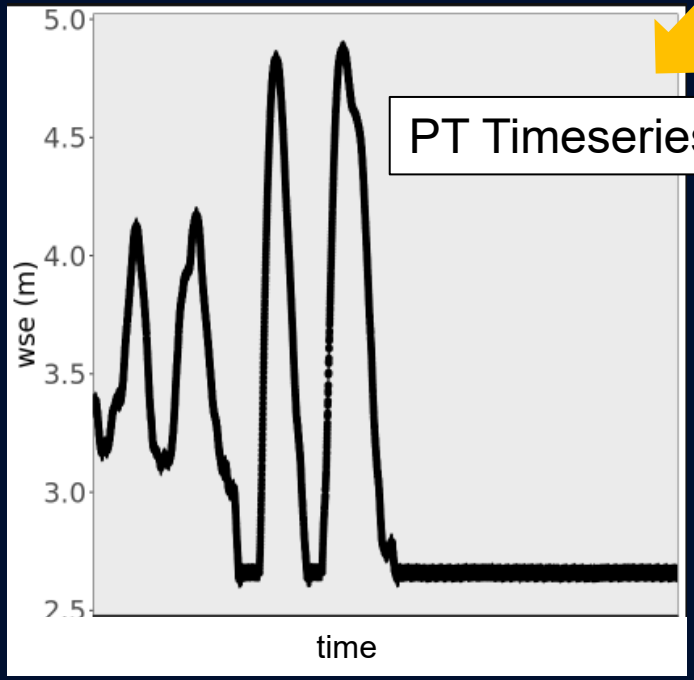
PT data: From field to SWORD product

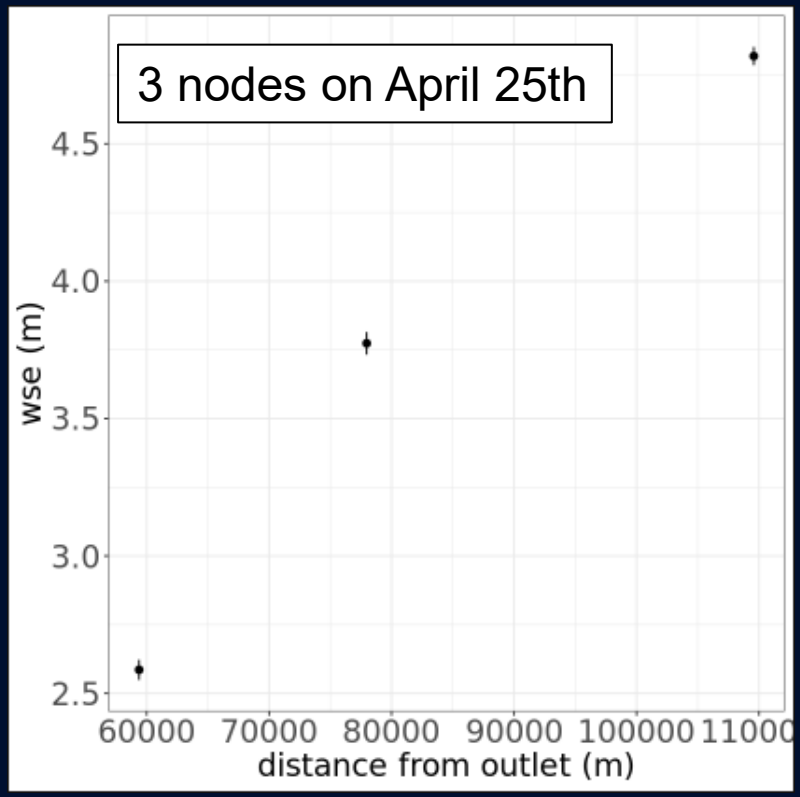
Raw PT

2156929				
Project ID:				
CR_2023_FS				
Location:				
PT007				
LEVEL				
UNIT: m				
Offset: 0.000000 m				
TEMPERATURE				
UNIT: °C				
Date	Time	ms	LEVEL	TEMPERATURE
4/2/2023	12:00:00 AM	0	10.047	15.4
4/2/2023	12:15:00 AM	0	10.053	15.5
4/2/2023	12:30:00 AM	0	10.056	15.5
4/2/2023	12:45:00 AM	0	10.056	15.5
4/2/2023	1:00:00 AM	0	10.062	15.6
4/2/2023	1:15:00 AM	0	10.062	15.6
4/2/2023	1:30:00 AM	0	10.065	15.7
4/2/2023	1:45:00 AM	0	10.068	15.7
4/2/2023	2:00:00 AM	0	10.068	15.8

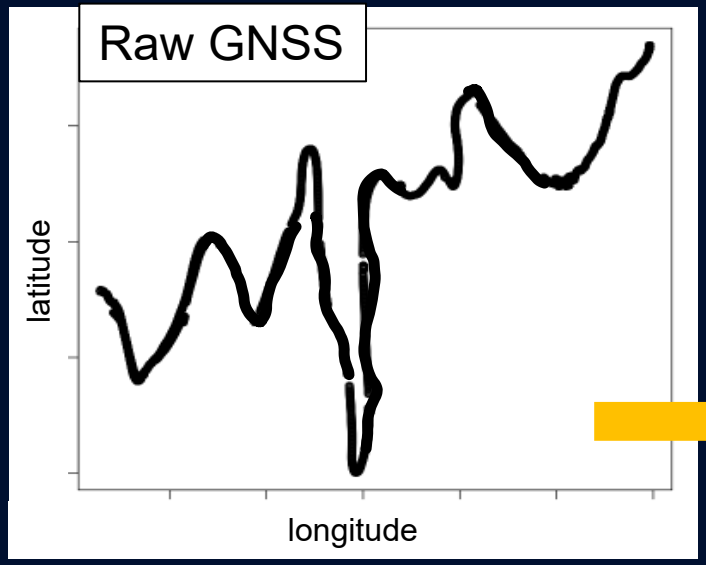
QA/QC PT, GNSS corrected

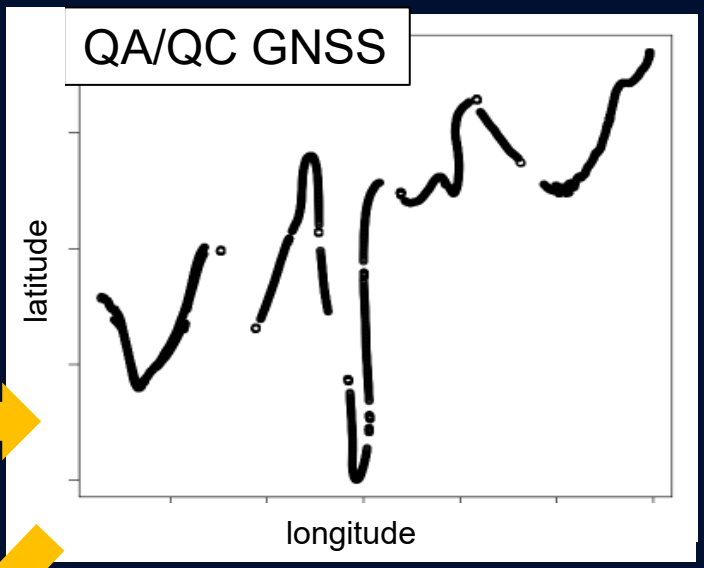
	pt_time_UTC	pt_wse
1	2023-04-04 17:15:00	3.01579792019815
2	2023-04-04 17:30:00	3.03479792019815
3	2023-04-04 17:45:00	3.03379792019815
4	2023-04-04 18:00:00	3.01479792019815
5	2023-04-04 18:15:00	3.04879792019815
6	2023-04-04 18:30:00	3.03179792019815
7	2023-04-04 18:45:00	3.02879792019815
8	2023-04-04 19:00:00	3.02379792019815
9	2023-04-04 19:15:00	3.02479792019815
10	2023-04-04 19:30:00	
11	23-04-04 19:45:00	

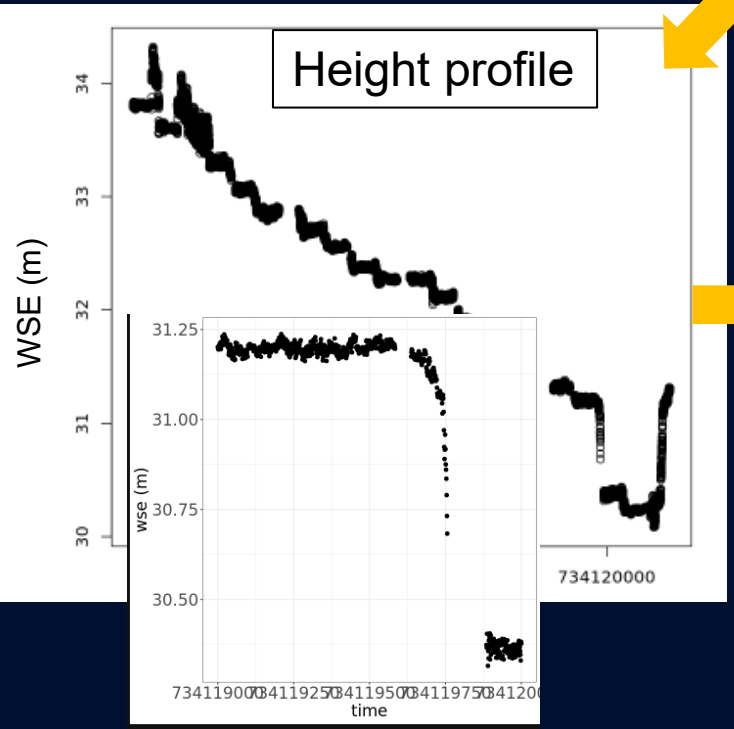


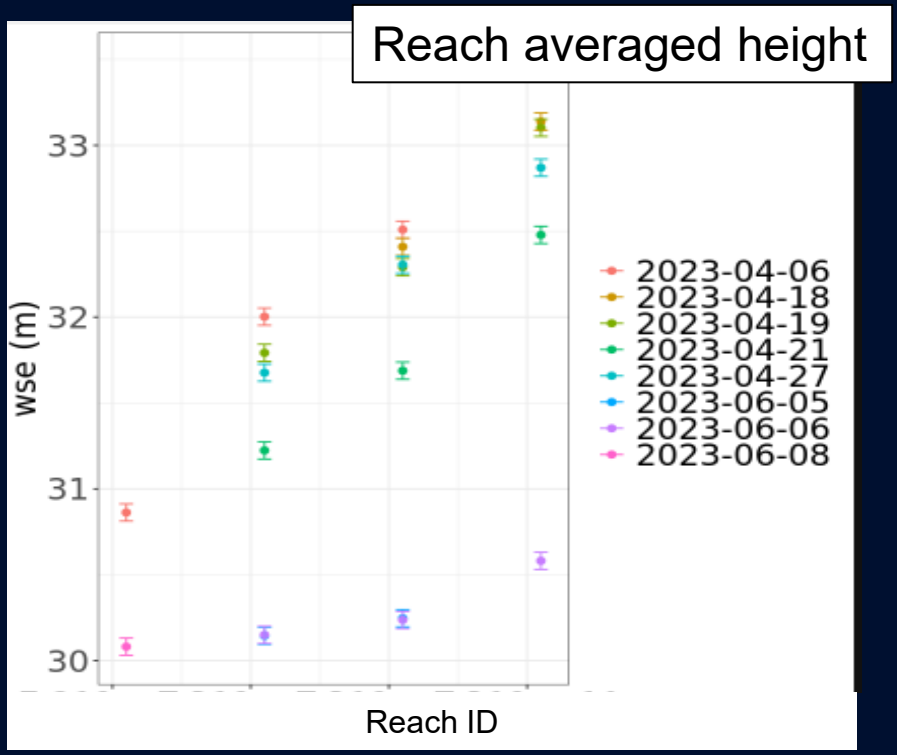


Drift data: from field to SWORD product



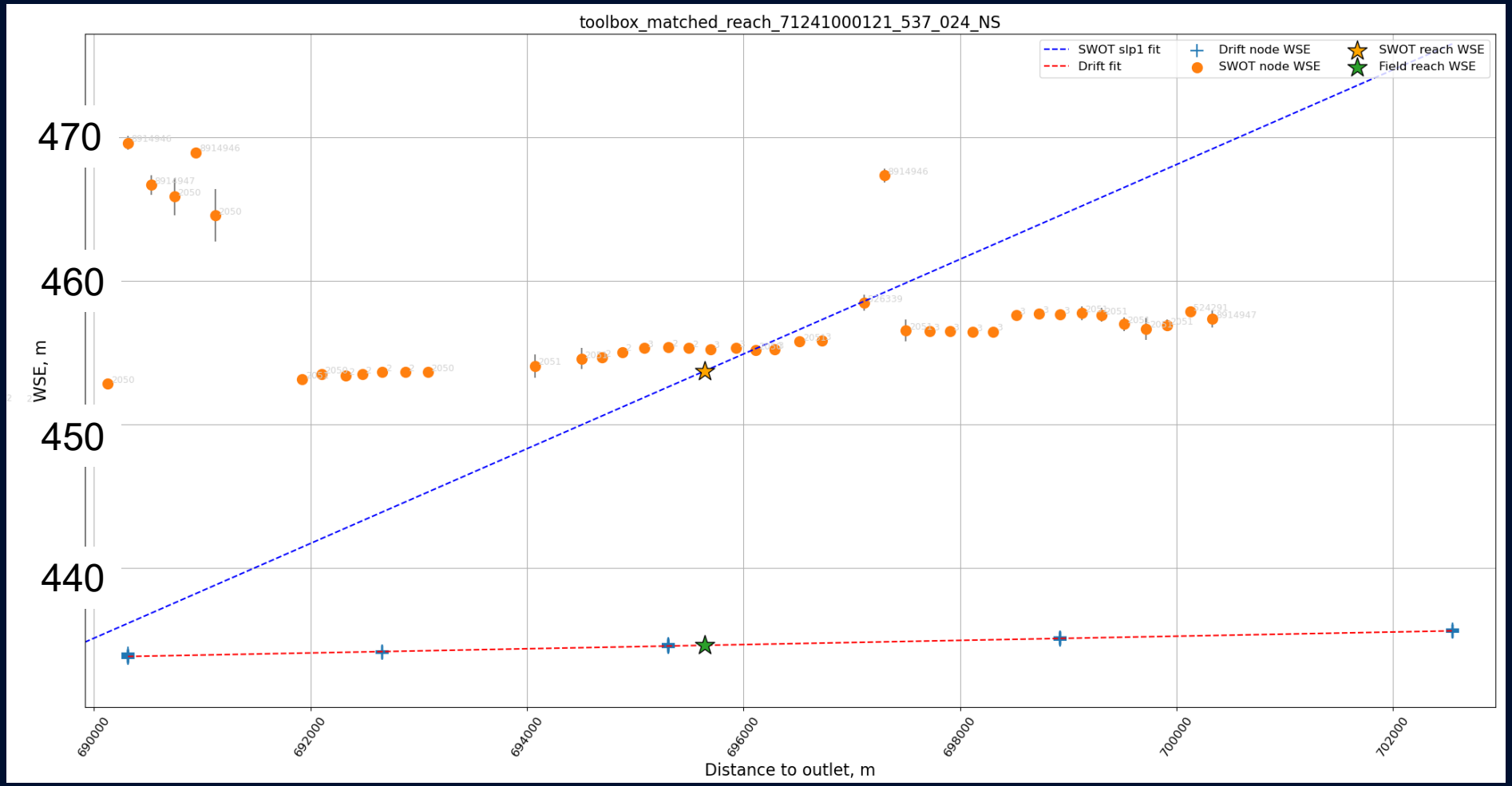






Examples of field and SWOT data

North Saskatchewan, May 31



We're not playing the same sport- pixel assignment errors and dark water

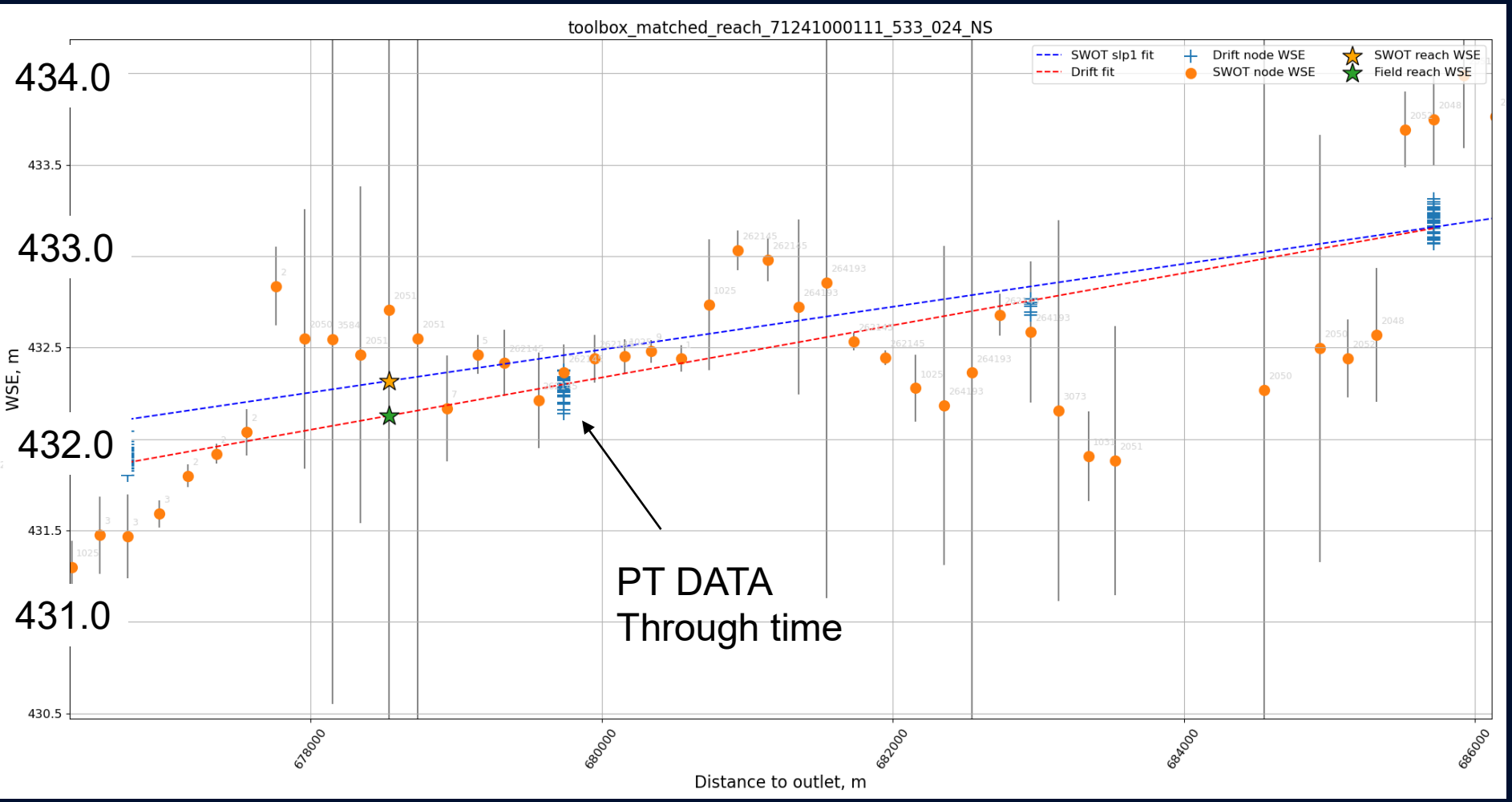
We understand this behavior and can correct it

Rare

CassiePlot™

Examples of field and SWOT data

North Saskatchewan, May 27



Large SWOT uncertainty (dark water, pixel assignment)

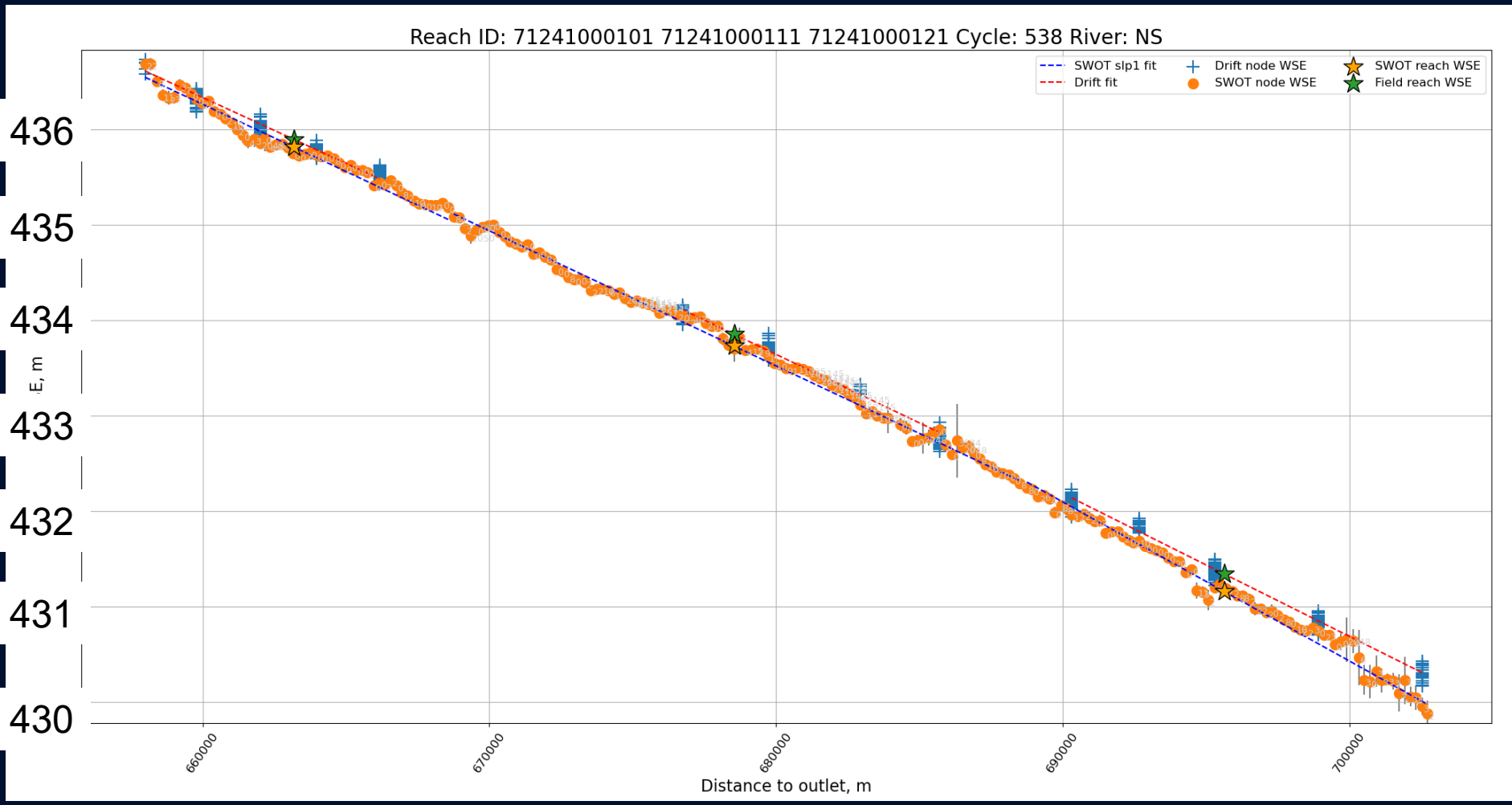
Slopes agree well- river structure preserved

Large biases between field and SWOT data

CassiePlot™

Examples of field and SWOT data

North Saskatchewan, June 1



Excellent results [masked by scale, of course ☺]

SWOT, drifts, and PTs all align

Reaches continue naturally

CassiePlot™

Examples of field and SWOT data

Connecticut, June 10

Hydraulic structure easy to see

Slope behavior affected by outliers

Red drift line disappears under SWOT data

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Takeaways

- We are where we think we should be
  - Data flow is good
  - Field data standards holding up
  - JPL/ST integration is very good

- Coarse validation going well
  - Led to changes to pixel assignment
  - Identification of cross over performance on vector product error
  - Identification of dark water as a major problem
  - Identification of bright fields as a problem
    - Effect recently reduced

- Fine validation to begin soon with reprocessed SWOT data