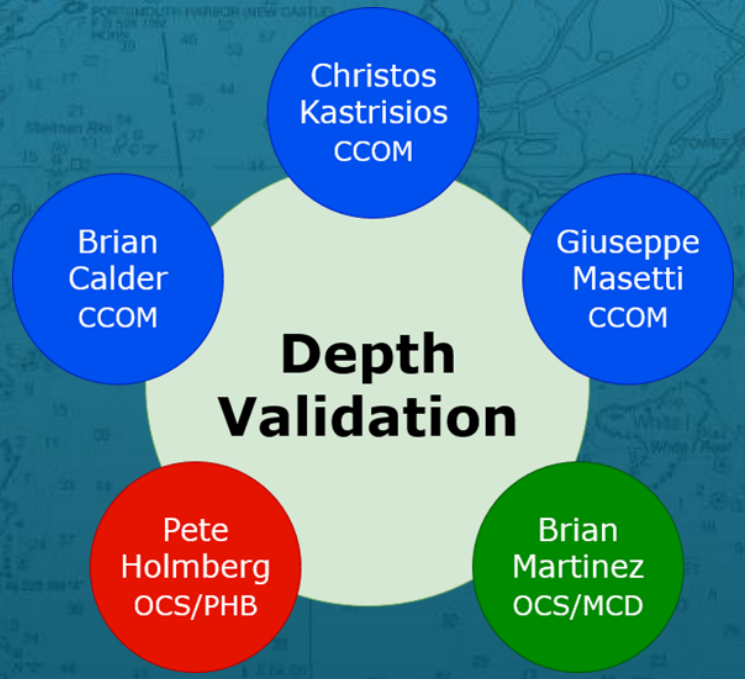
CHC 2020 CONFERENCE
Hydrography 2020: Dynamic Evolution
Québec City

Canadian Hydrographic Conference
Quebec City, Feb. 24-27, 2020



Soundings Validation Toolbox

Research to Operations

Christos Kastrisios

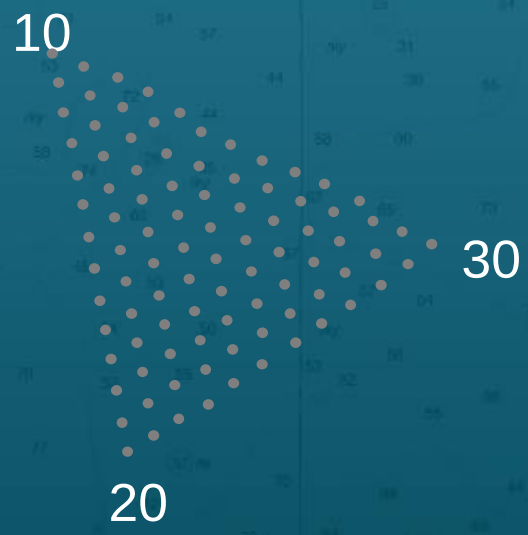
February 26, 2020

"Safety"

Depth curves

SW → DW

Soundings



Canadian Hydrographic Conference

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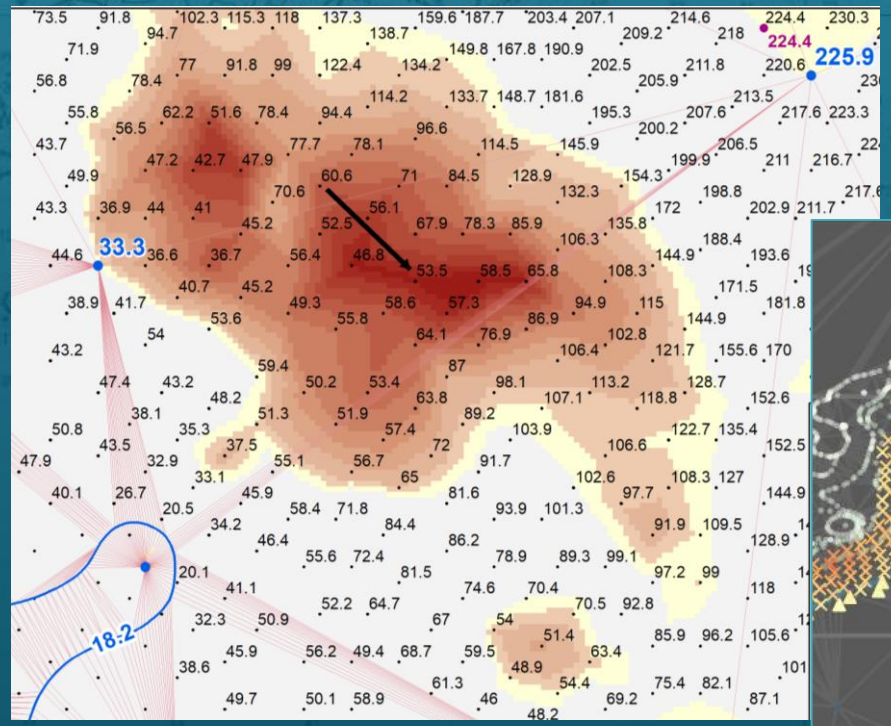
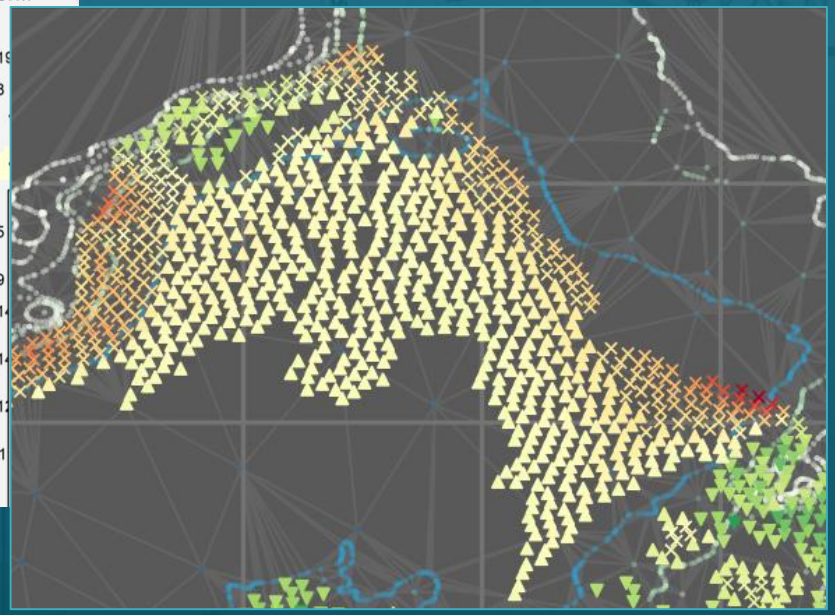
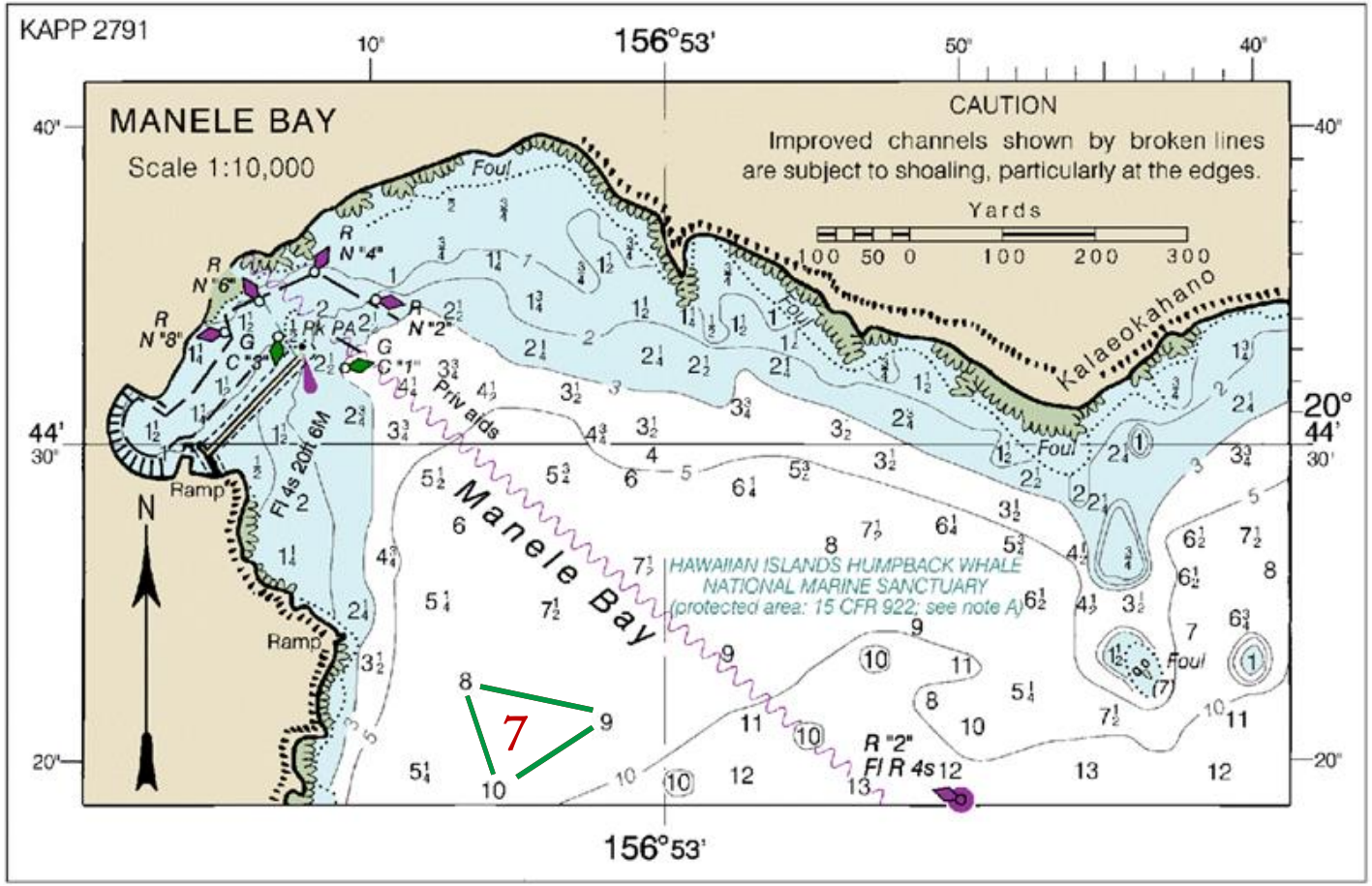
"Safety"





Safety Constraint

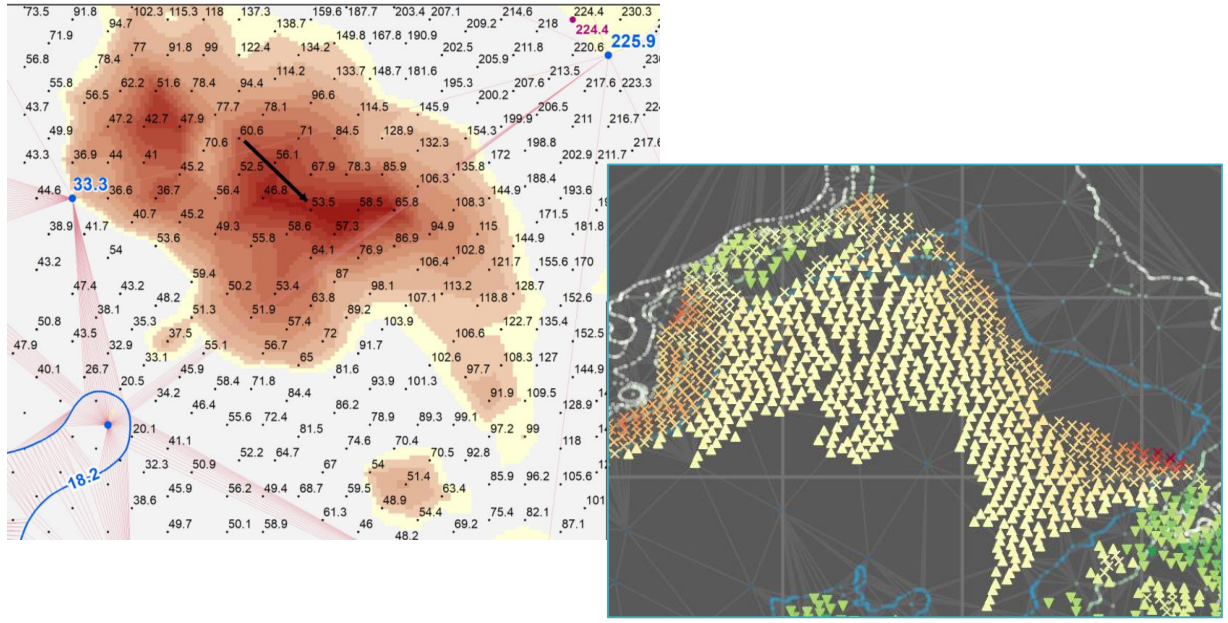


- Constraints
  - Morphology
  - Legibility
  - Topology
  - **Safety**

"The expected depth must not appear deeper than the source information".

Scope

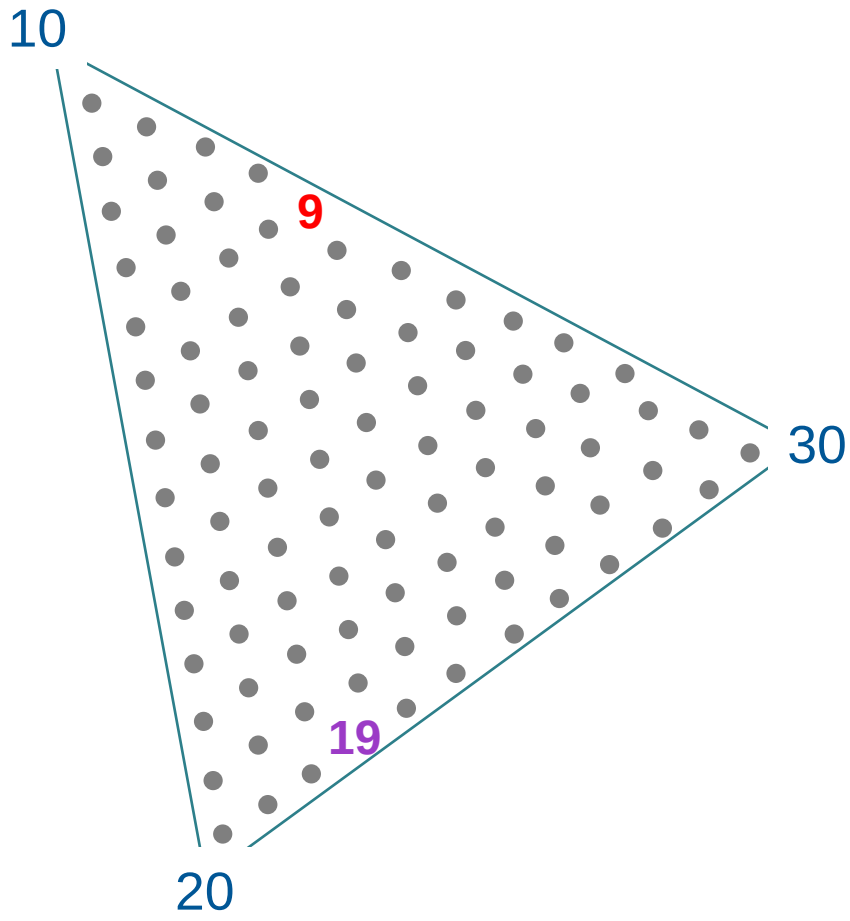
- Automate sounding validation



IHO S-4

"Triangle test"

"*No actual sounding exists within a triangle of selected soundings which is less than the least of any of the soundings forming the triangle*"



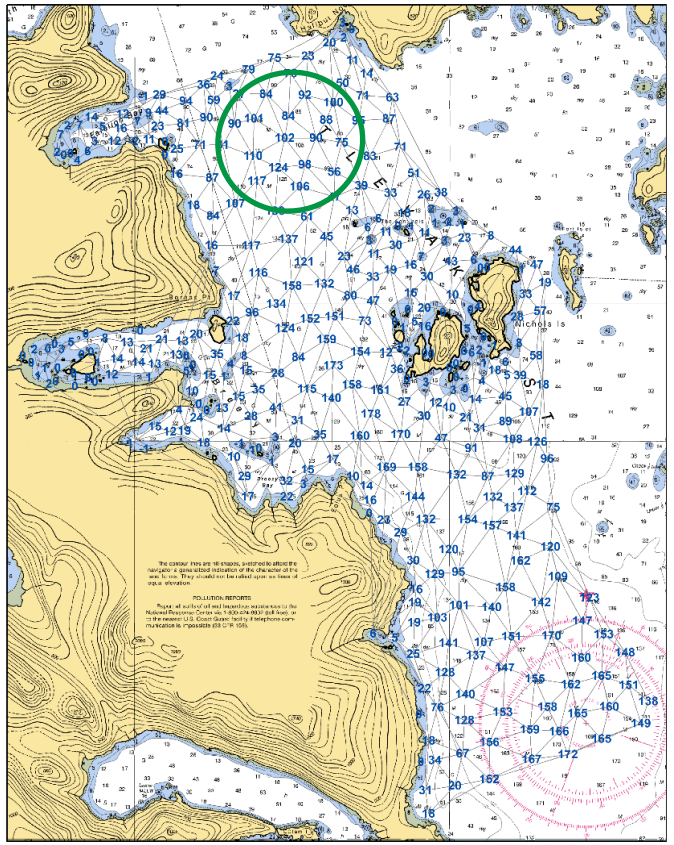
"Edge test"

"*No actual sounding exists between two adjacent selected soundings forming an edge of the triangle which is less than the lesser of the two selected soundings* "

Triangle & Edge Tests

TT and ET implementation

- S-4: Network of triangles from selected soundings



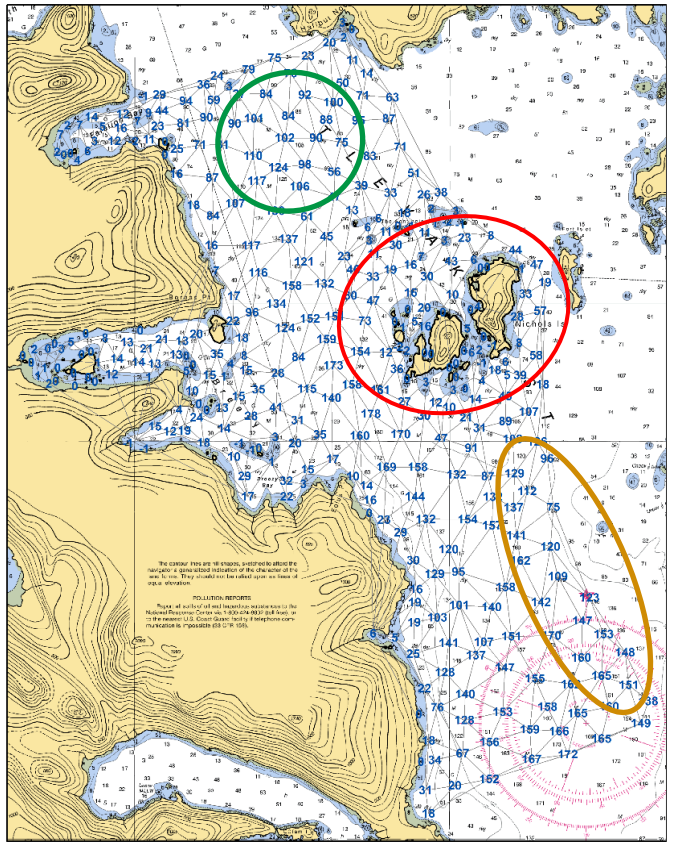
TRIANGLE & EDGE TESTS

~~TT and ET implementation~~

Modified TT and ET

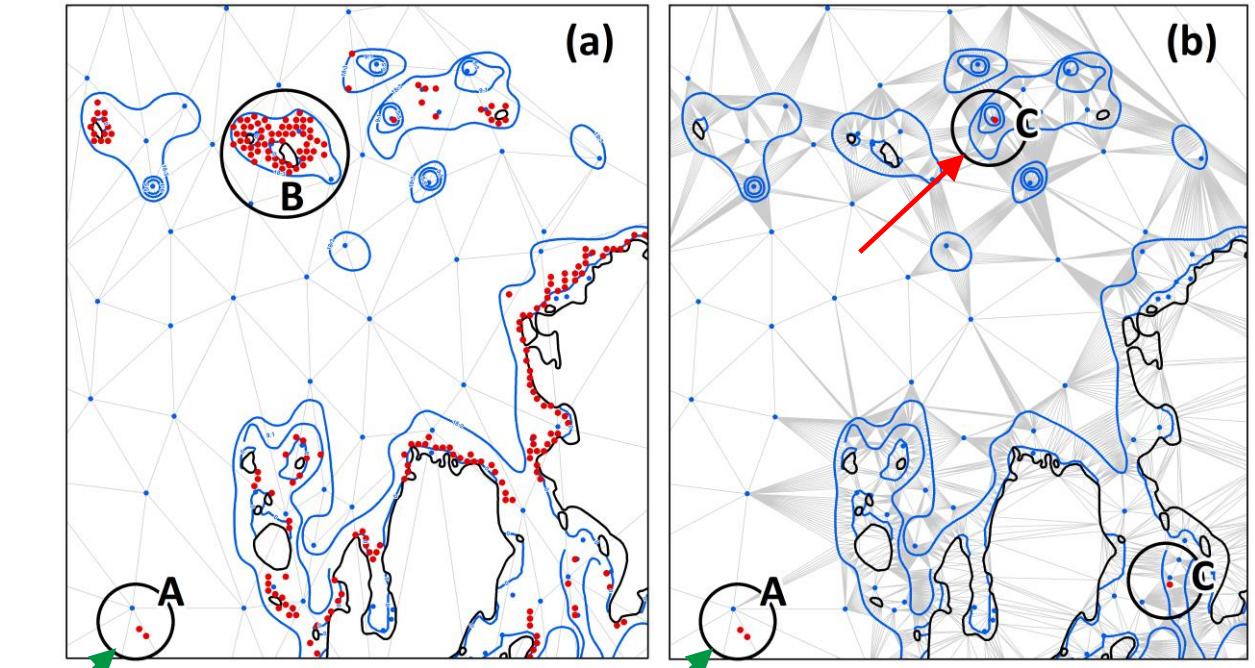
- S-4: Network of triangles from selected soundings

- Practice:
  - Open areas:
    Triangles from selected soundings
  - Near and within linear features:
    Areas of dominance
  - Near the boundaries of the updated area:
    "Incorporate" bathymetry from "Chart Interface"



Triangle & Edge Tests

- ~~TT and ET implementation~~
- Modified TT and ET

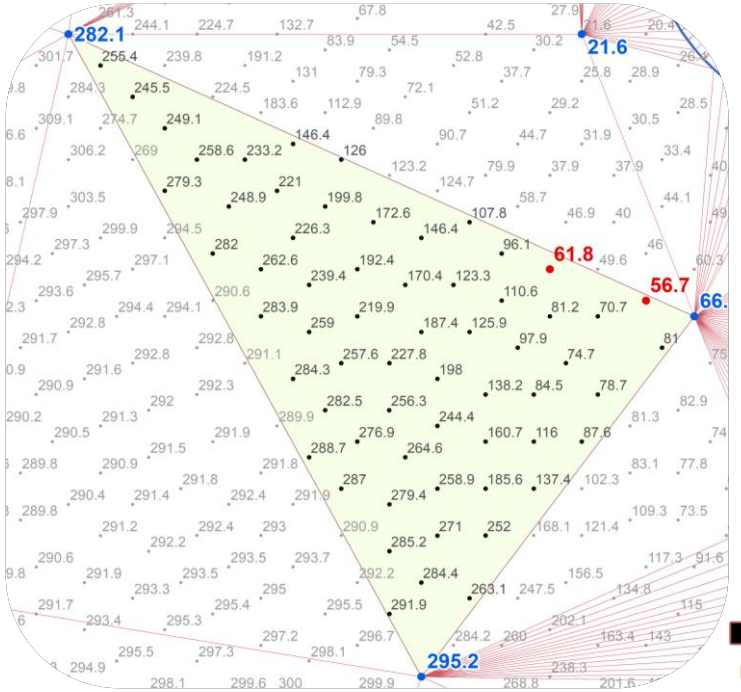


Triangle Test

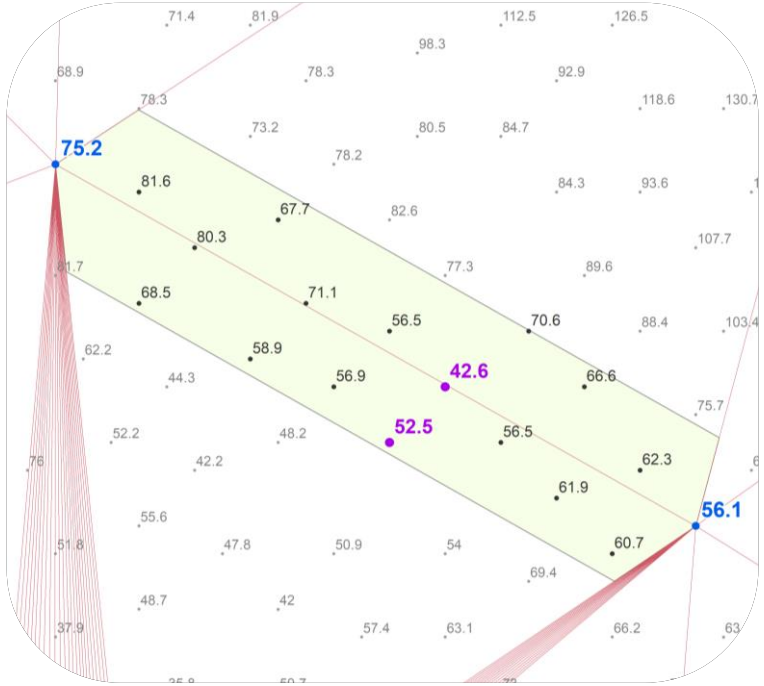
Modified Triangle Test

Triangle & Edge Tests

- ~~TT and ET implementation~~
- Modified TT and ET



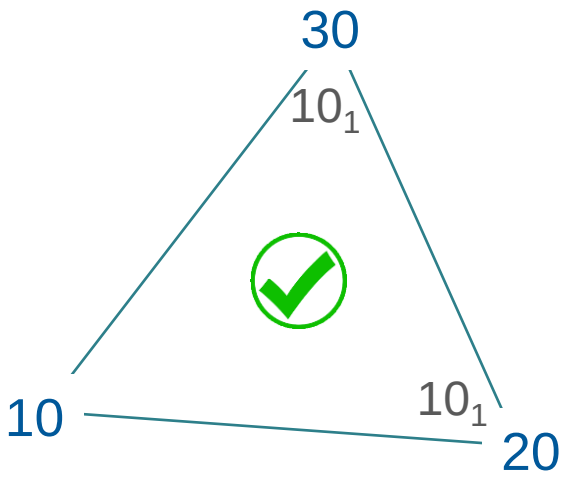
TT

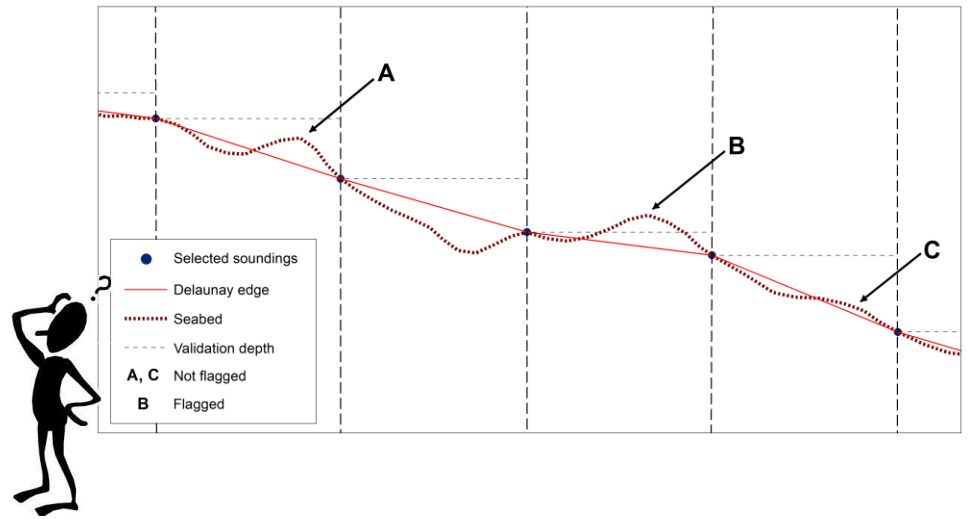


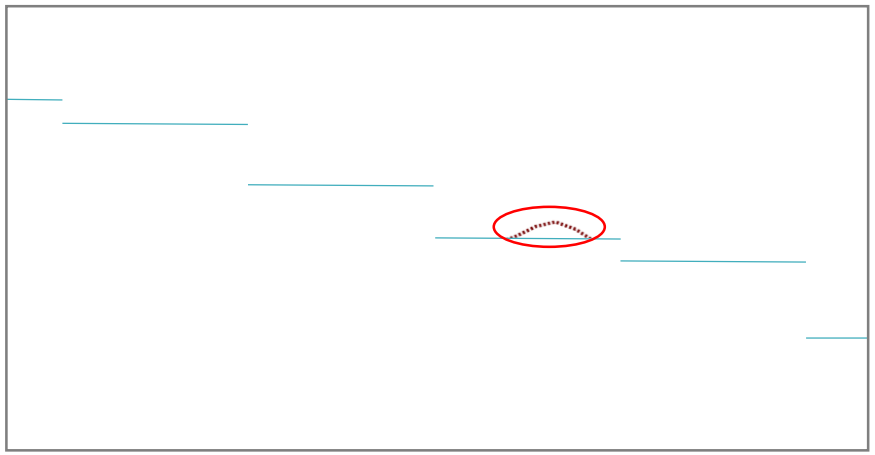
ET

Intrinsic Limitation

- ~~TT and ET implementation~~
- Modified TT and ET
- TT and ET limitation

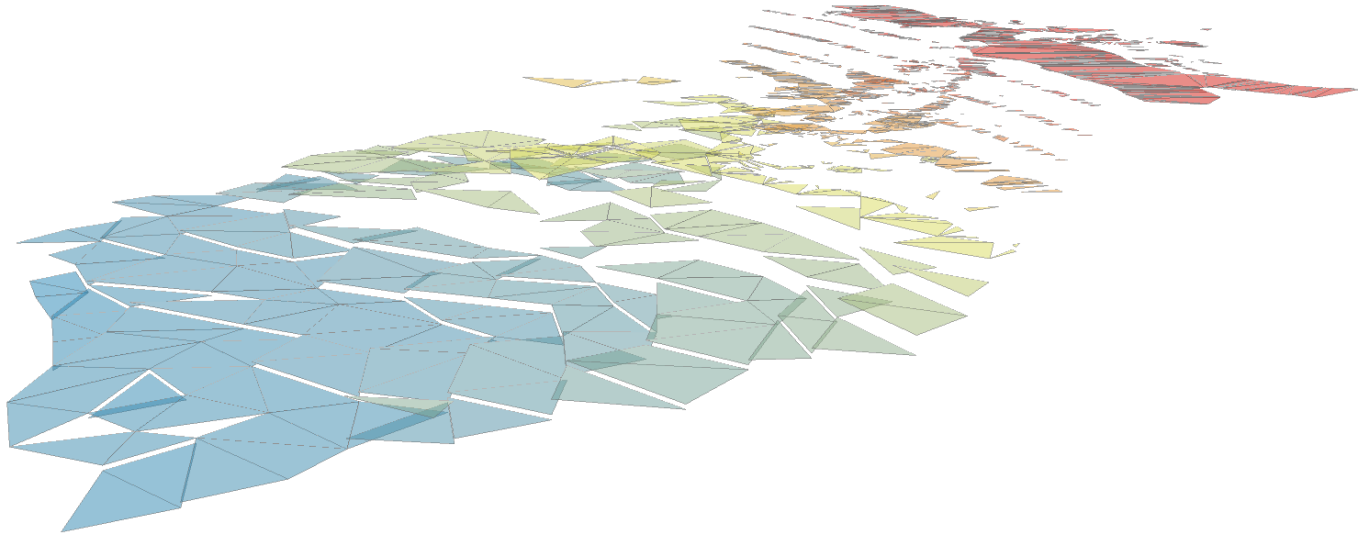






Intrinsic Limitation

- ~~TT and ET implementation~~
- Modified TT and ET
- TT and ET limitation



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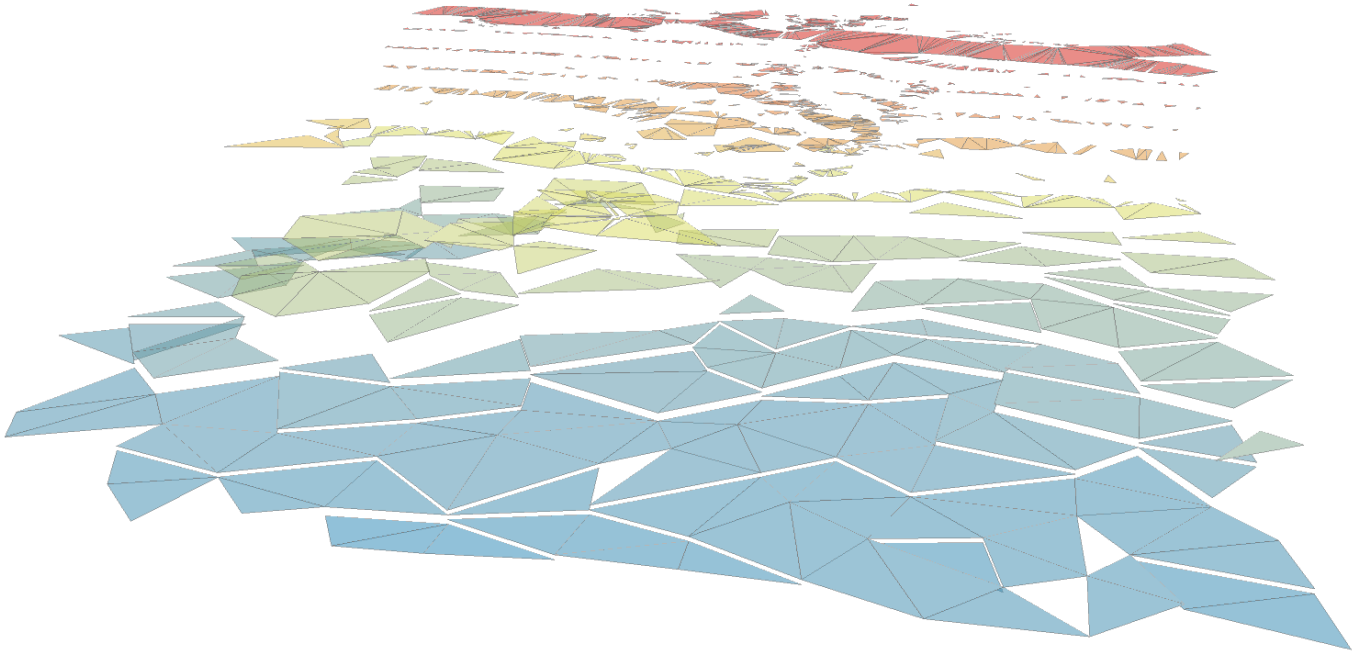

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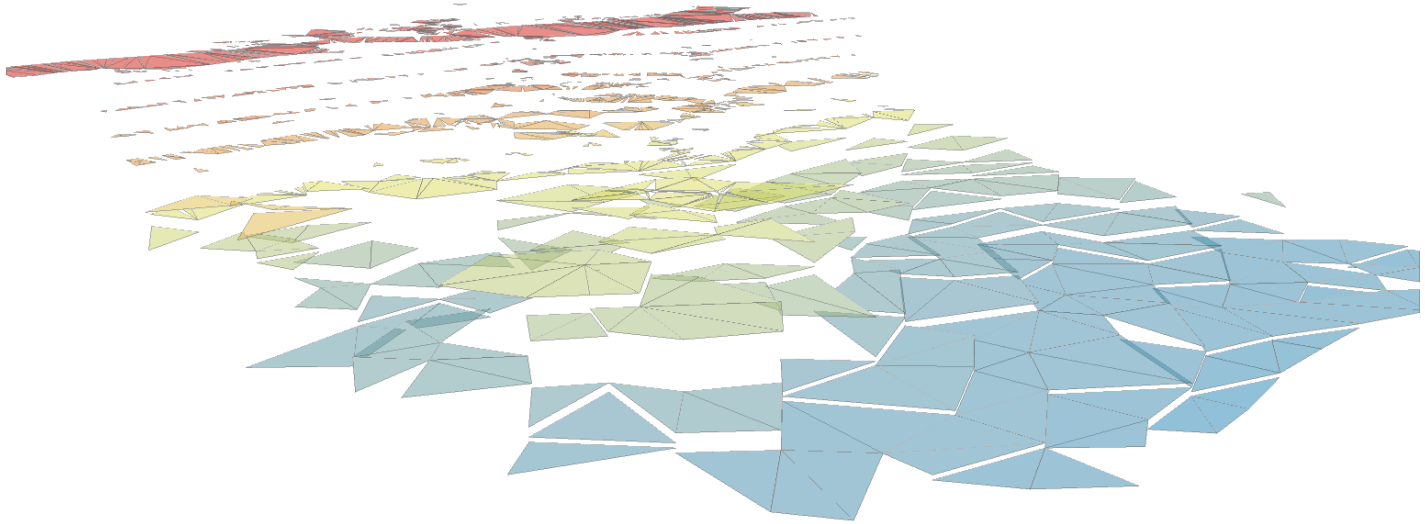

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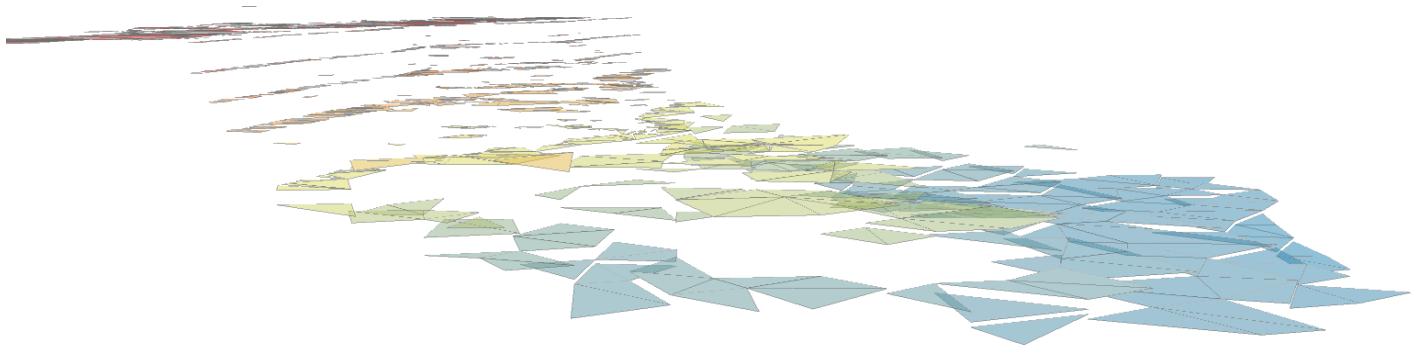

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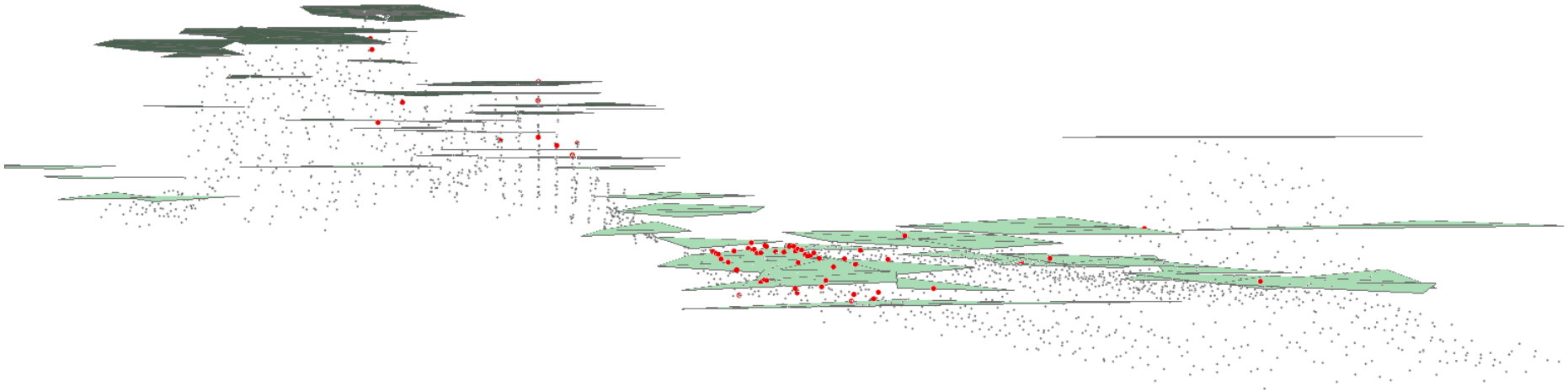
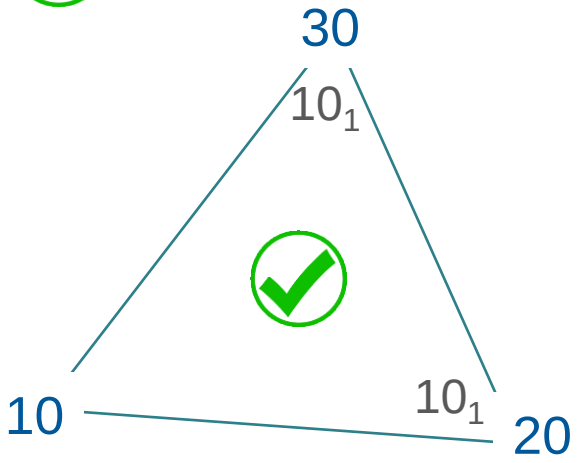
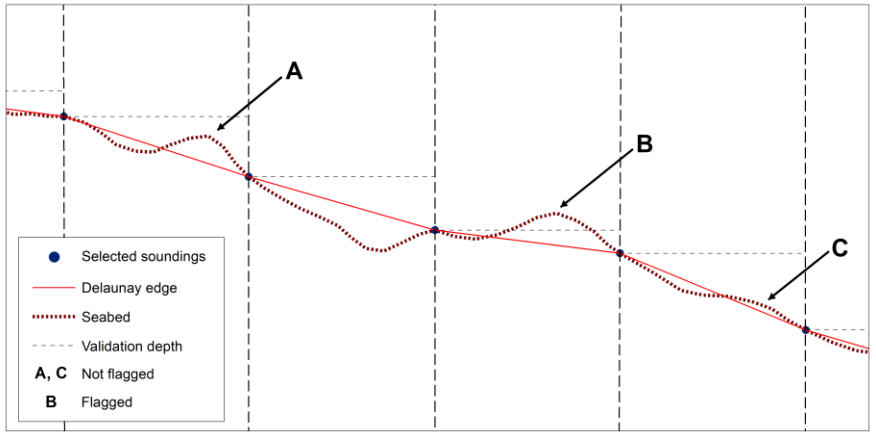
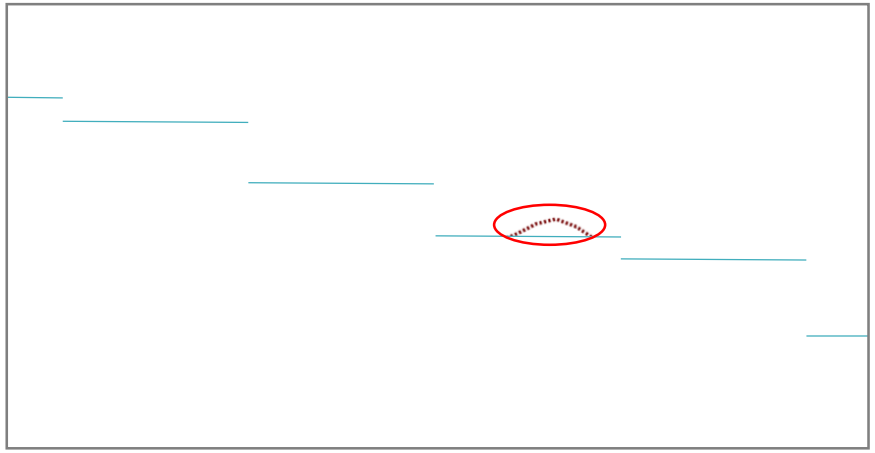


Surface Test

- ~~TT and ET implementation~~
- Modified TT and ET
- TT and ET limitation
- Nautical Surface Test (ST)

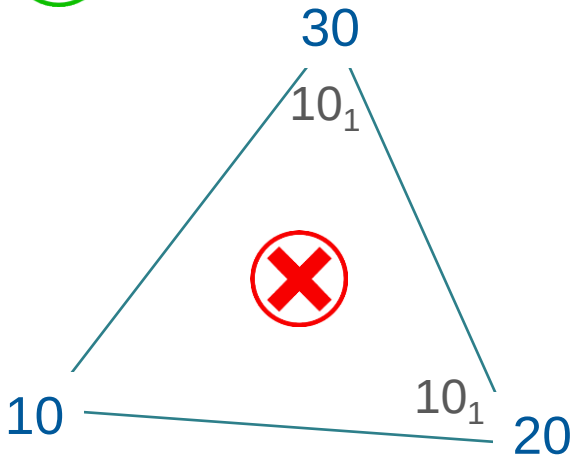


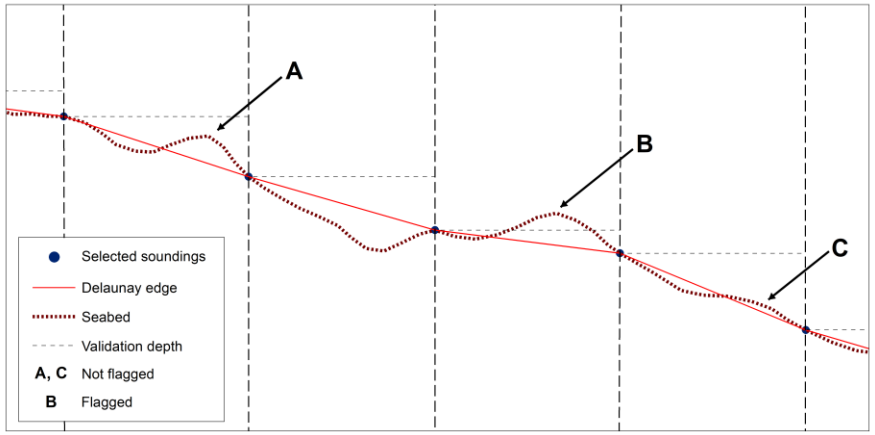


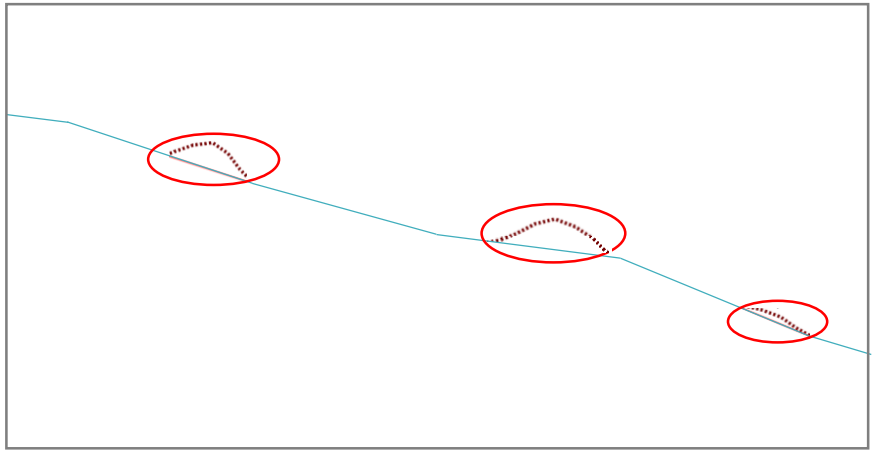


Surface Test

- ~~TT and ET implementation~~
- Modified TT and ET
- TT and ET limitation
- Nautical Surface Test (ST)







Surface Test

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- Modified TT and ET
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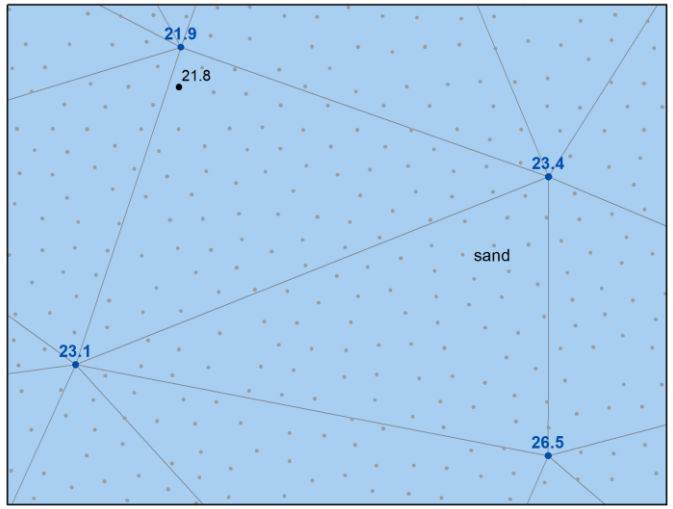

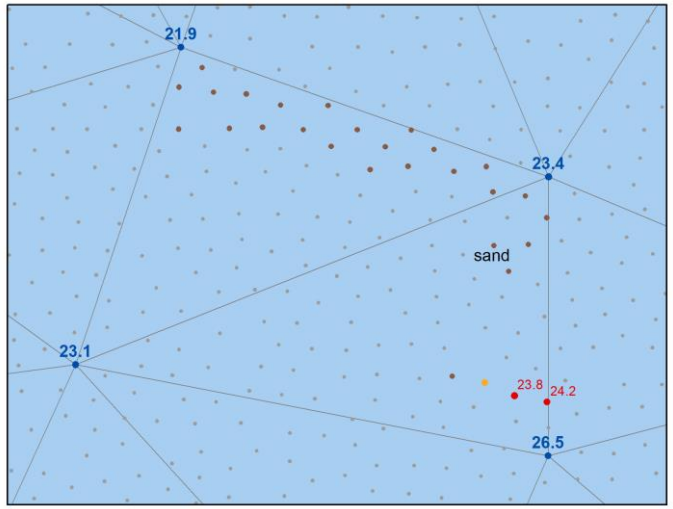

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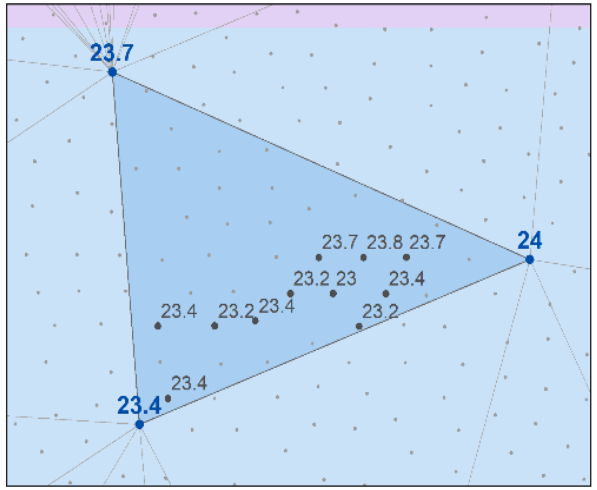
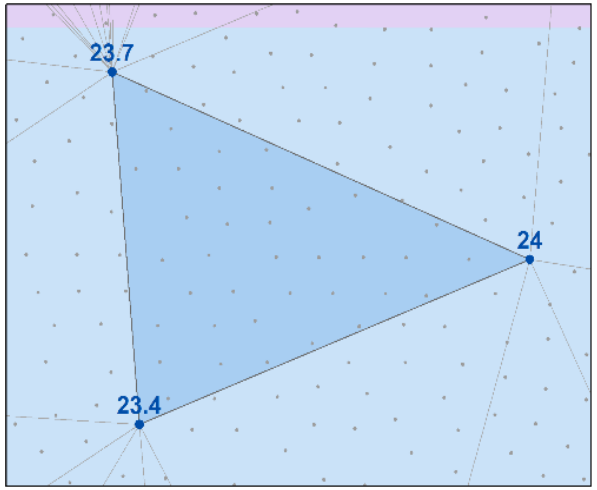
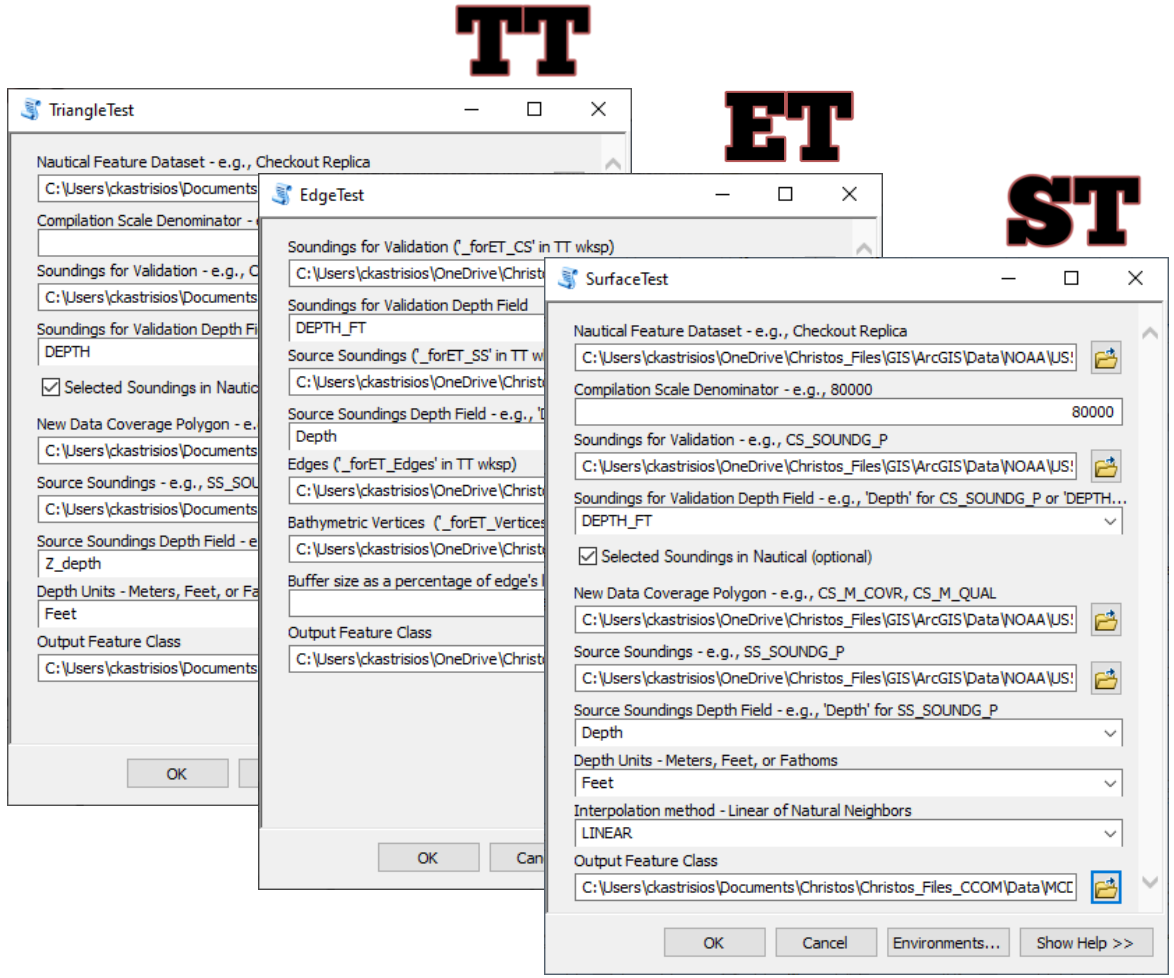




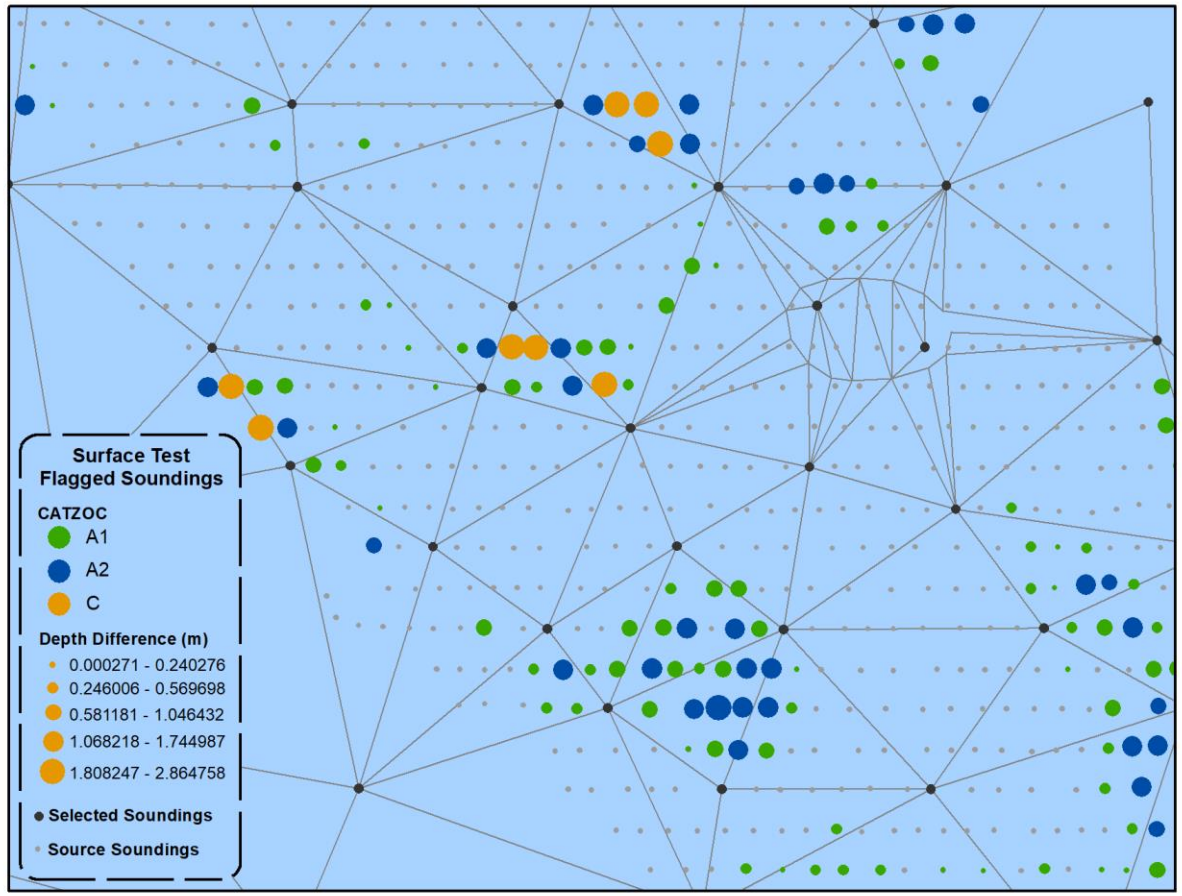
Validation Toolbox

- ~~TT and ET implementation~~
- Modified TT and ET
- TT and ET limitation
- Nautical Surface Test (ST)
- TT, ET, ST Toolset



VALIDATION TOOLBOX

- ~~TT and ET implementation~~
- Modified TT and ET
- TT and ET limitation
- Nautical Surface Test (ST)
- R20 TT, ET, ST Toolset



VALIDATION TOOLBOX

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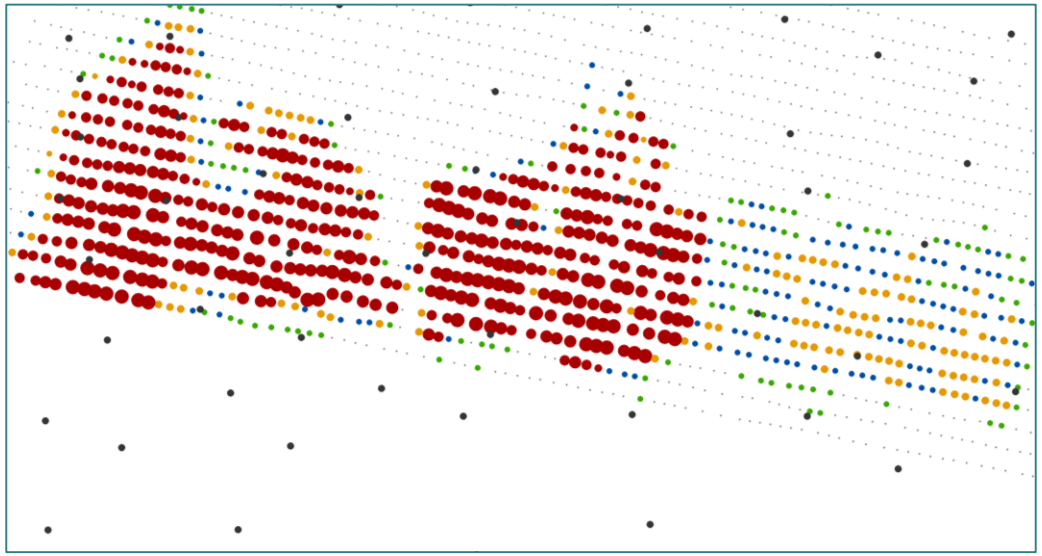
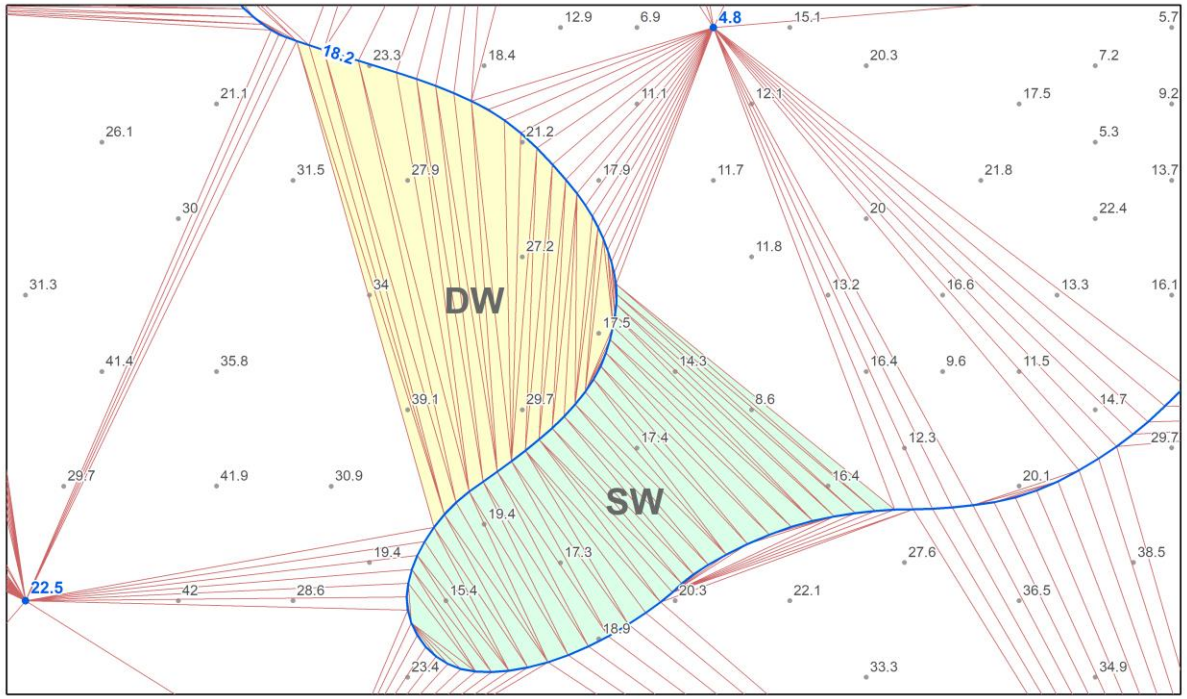
- Modified TT and ET
- TT and ET limitation
- Nautical Surface Test (ST)
- R20 TT, ET, ST Toolset



Future Work / Limitations

- Vertical consistency
- Flat triangles (point-in-polygon test)
- Nautical surface reconstruction



THANK YOU!

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