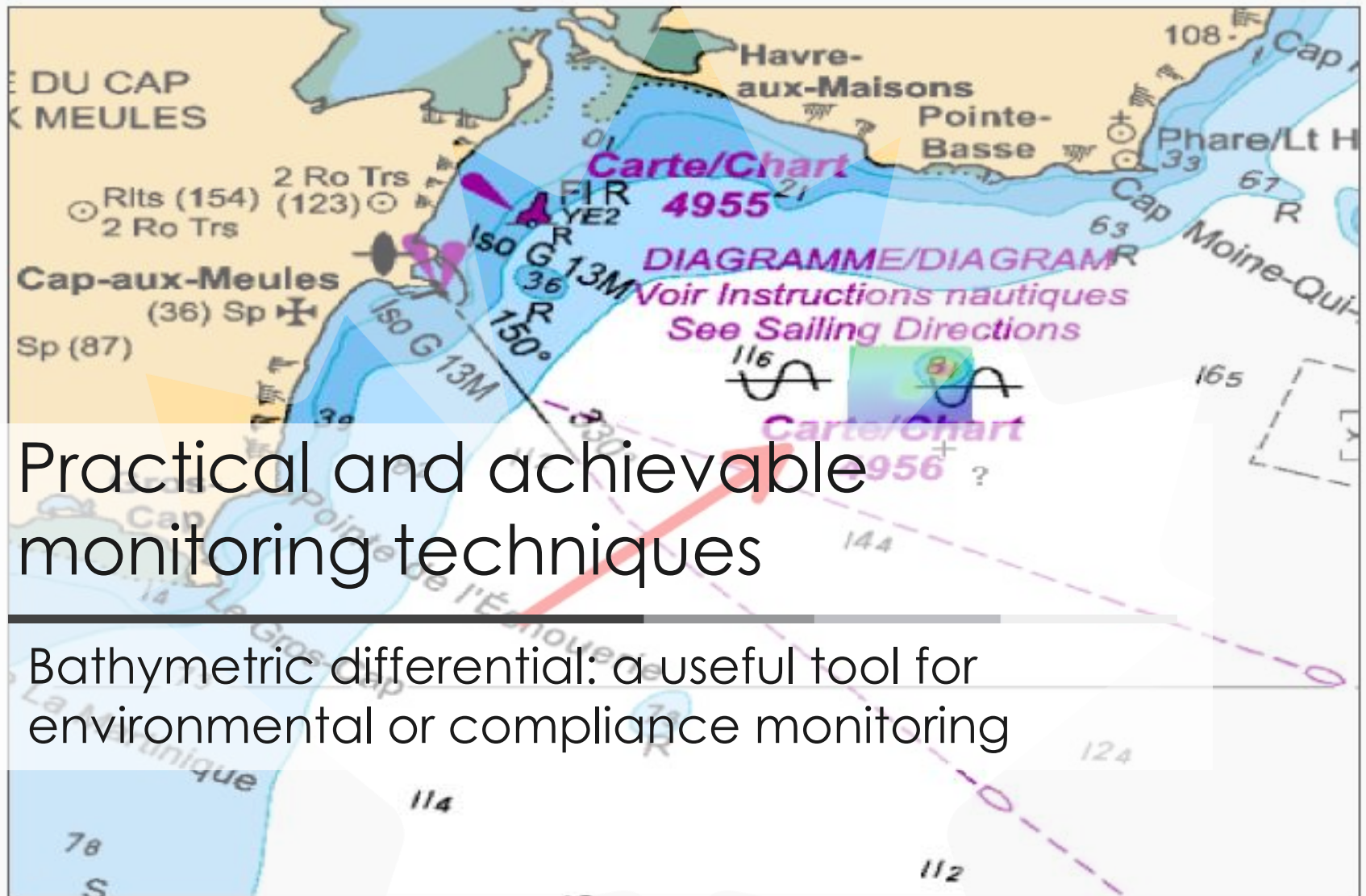
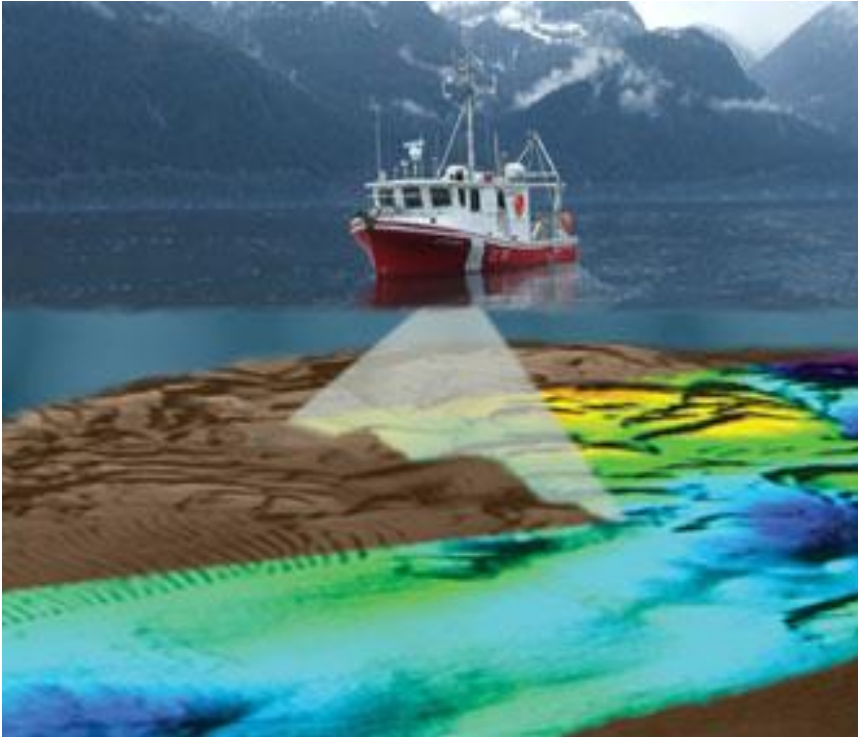




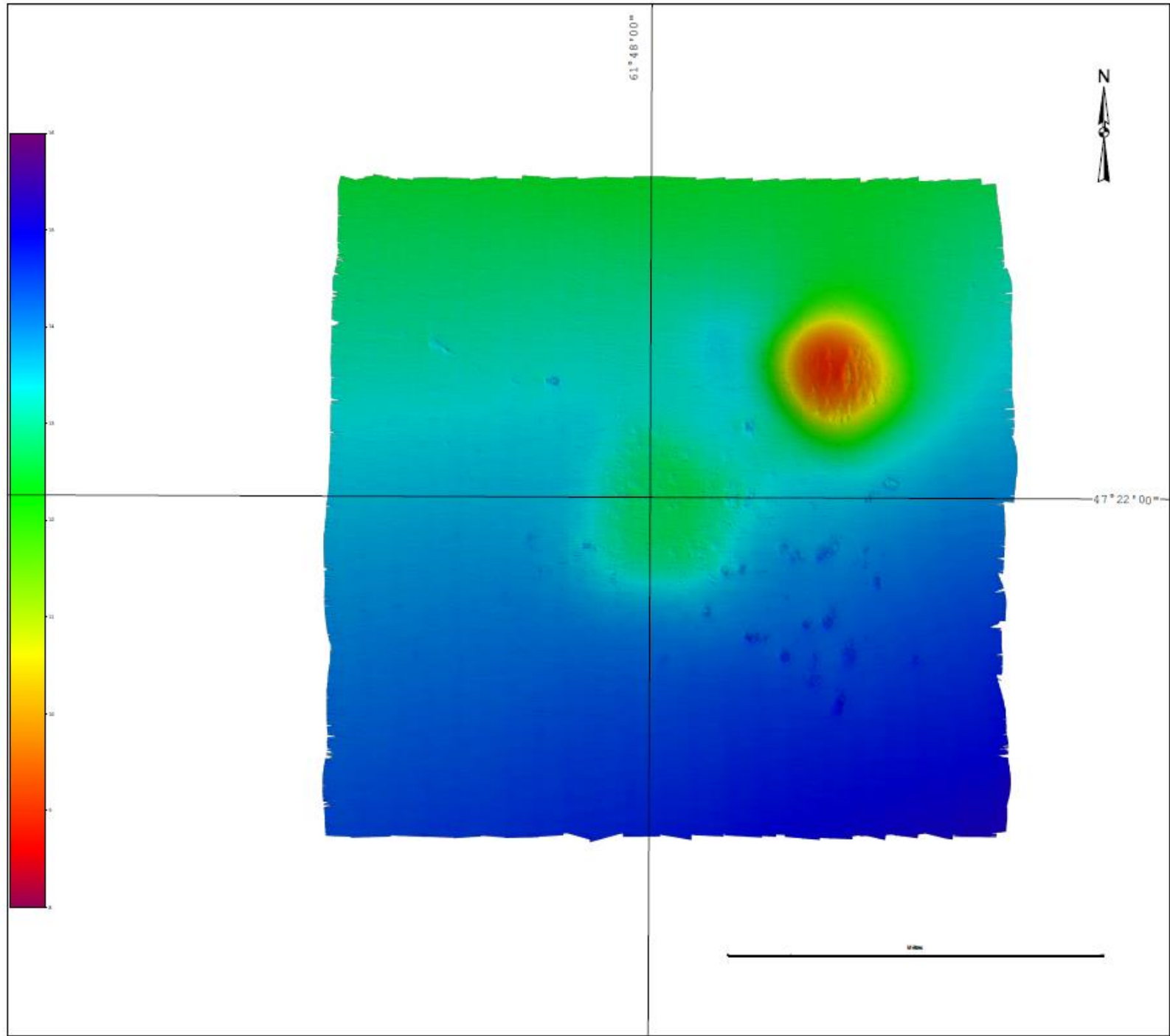
Practical and achievable monitoring techniques

Bathymetric differential: a useful tool for environmental or compliance monitoring

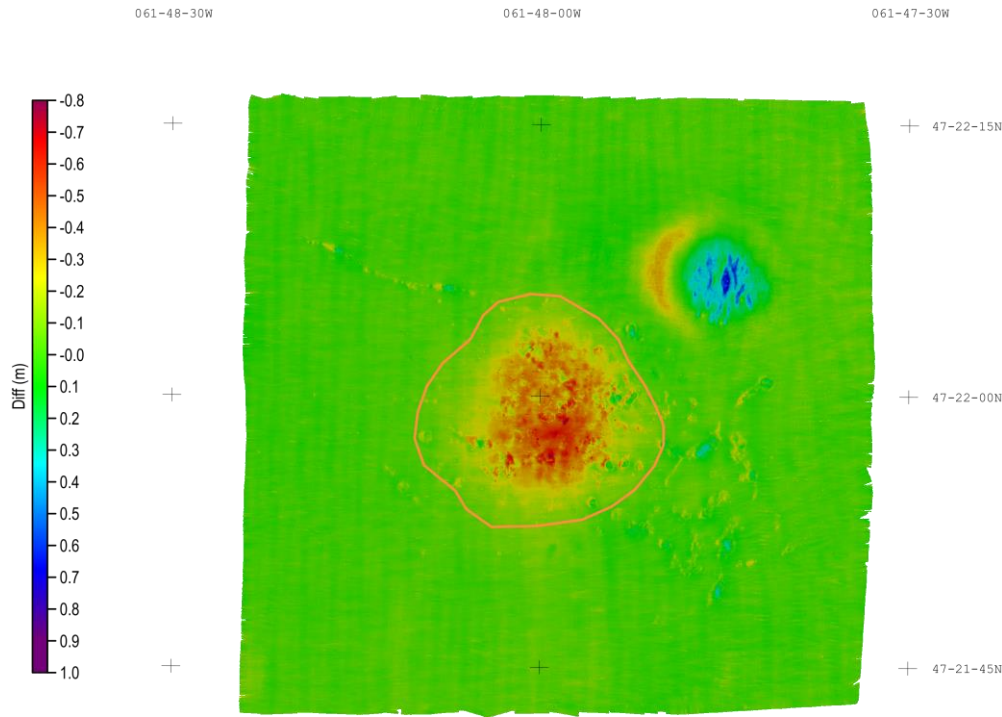
Hydrographic surveys



*Monitoring of
disposal at sea sites using
hydrographic surveys.*



Bathymetric differential



Bathymetric differential at each disposal at sea site:

- *to estimate volume of sediments*
- *to estimate impacted area*

Results

Survey

PP

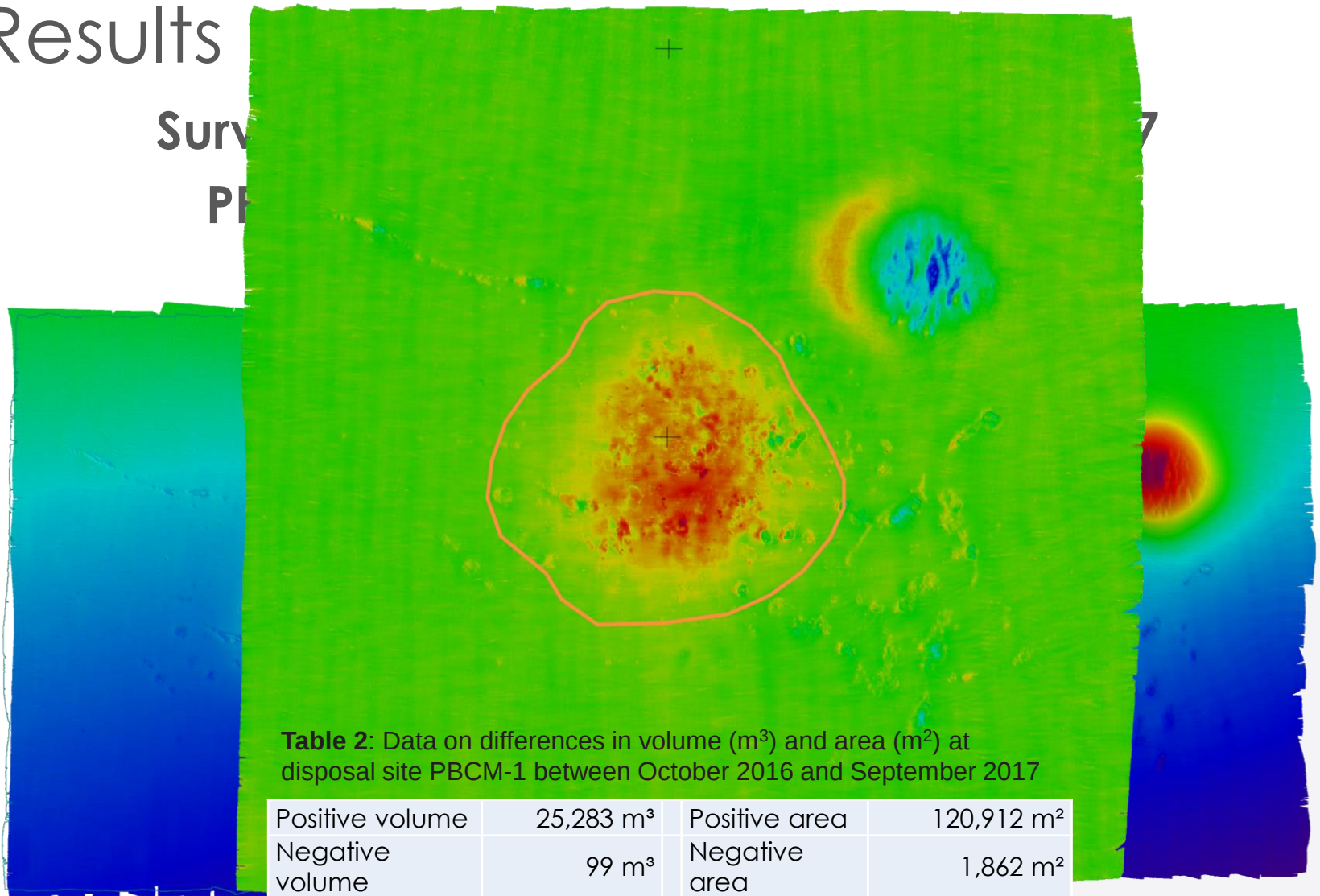


Table 2: Data on differences in volume (m^3) and area (m^2) at disposal site PBCM-1 between October 2016 and September 2017

Positive volume	25,283 m^3	Positive area	120,912 m^2
Negative volume	99 m^3	Negative area	1,862 m^2
Absolute total	25,184 m^3	Total area	122,774 m^2

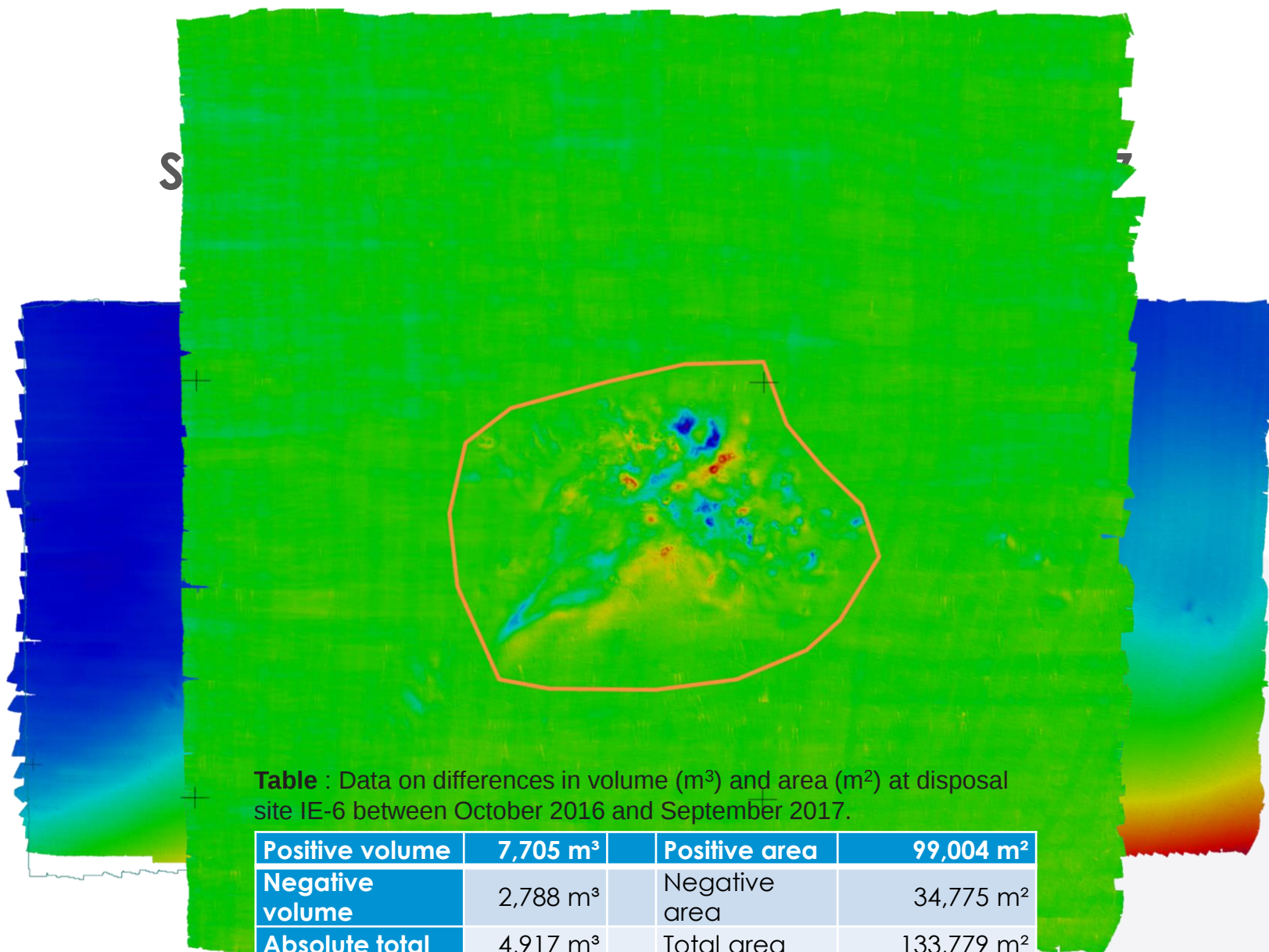
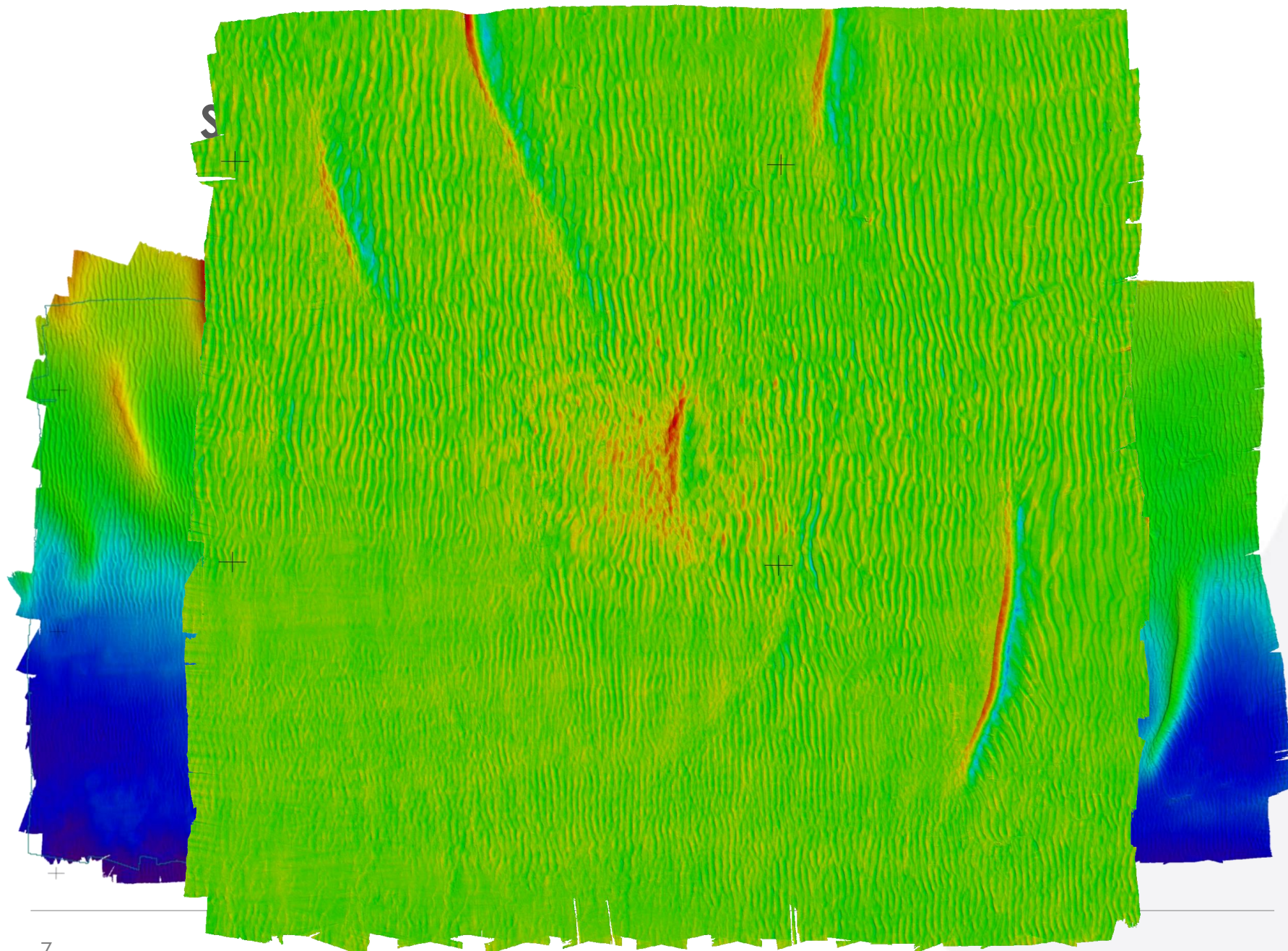
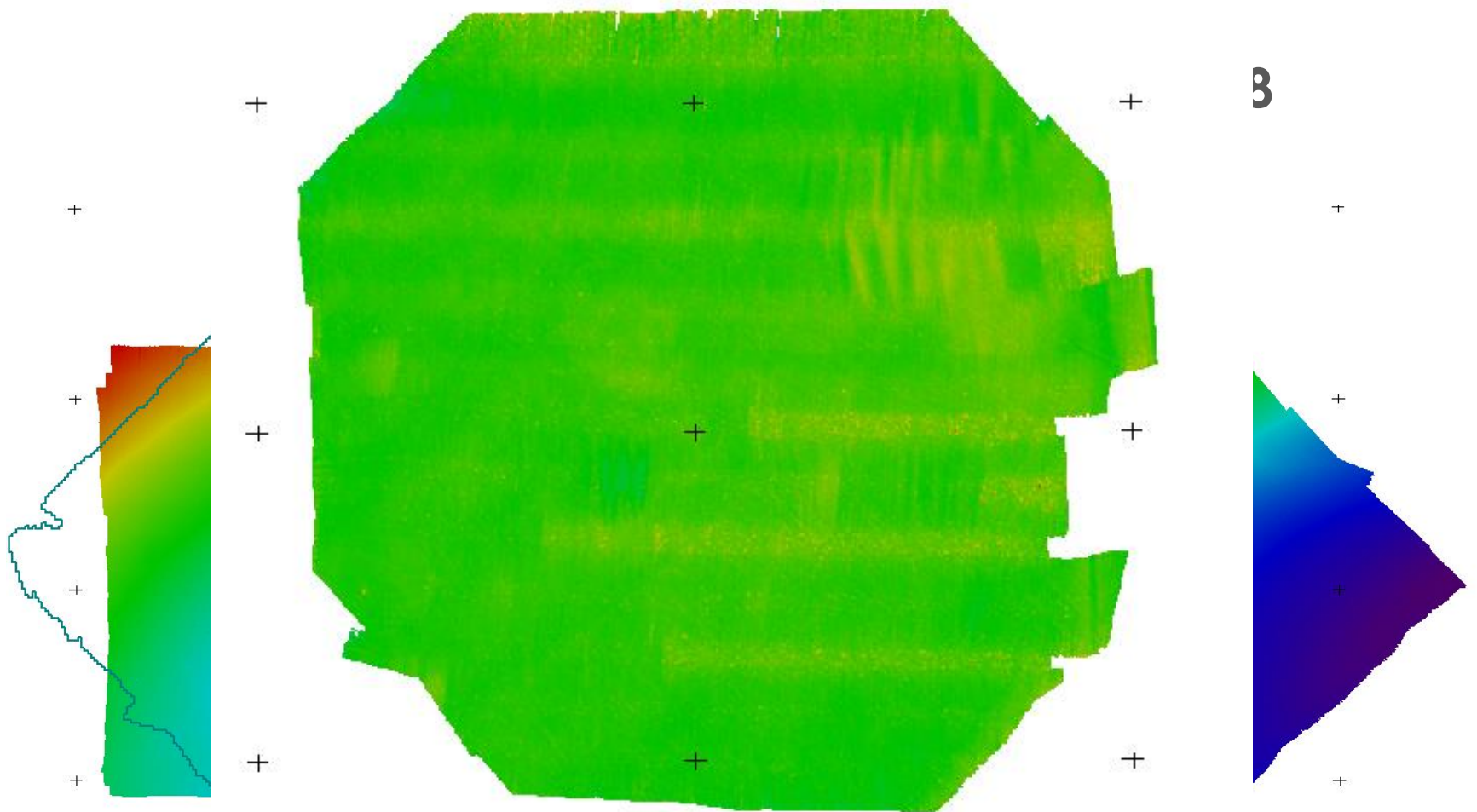


Table : Data on differences in volume (m³) and area (m²) at disposal site IE-6 between October 2016 and September 2017.

Positive volume	7,705 m ³	Positive area	99,004 m ²
Negative volume	2,788 m ³	Negative area	34,775 m ²
Absolute total	4,917 m ³	Total area	133,779 m ²

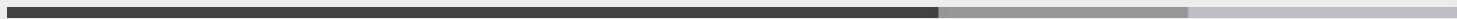




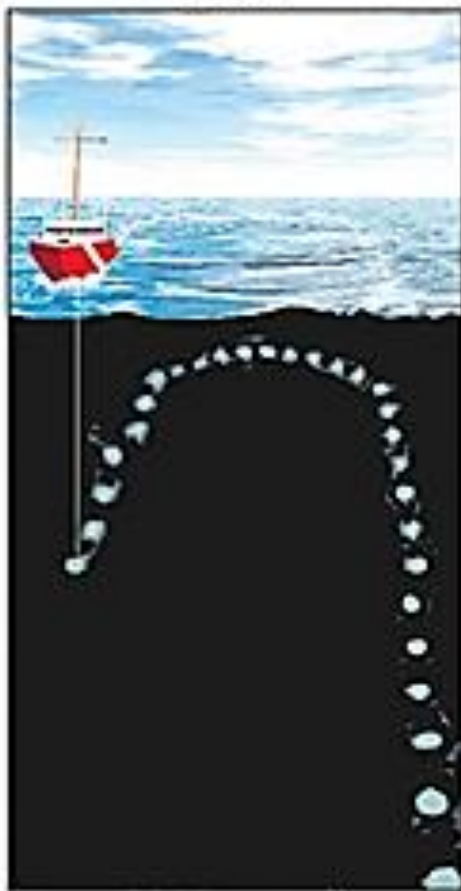
High-tech method

- Soundings done with a multibeam echosounder
- Area covered = 1 km²
- Area centered along coordinates of disposal at sea sites

Low-tech method can lead to similar results



Leadline



Up to 2000 soundings
per survey

Single beam



500,000 - 750,000
soundings per survey

Multi-beam



Gigabytes-to-terabytes
of soundings per survey
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Thank you