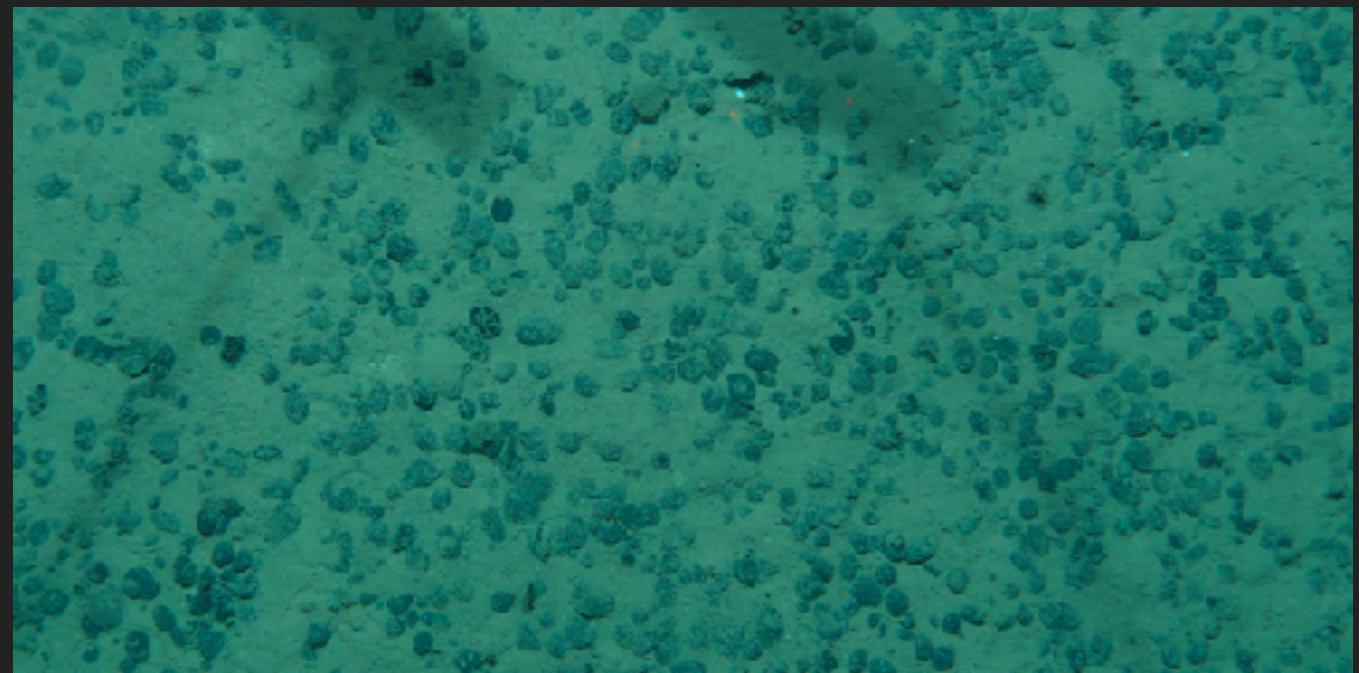
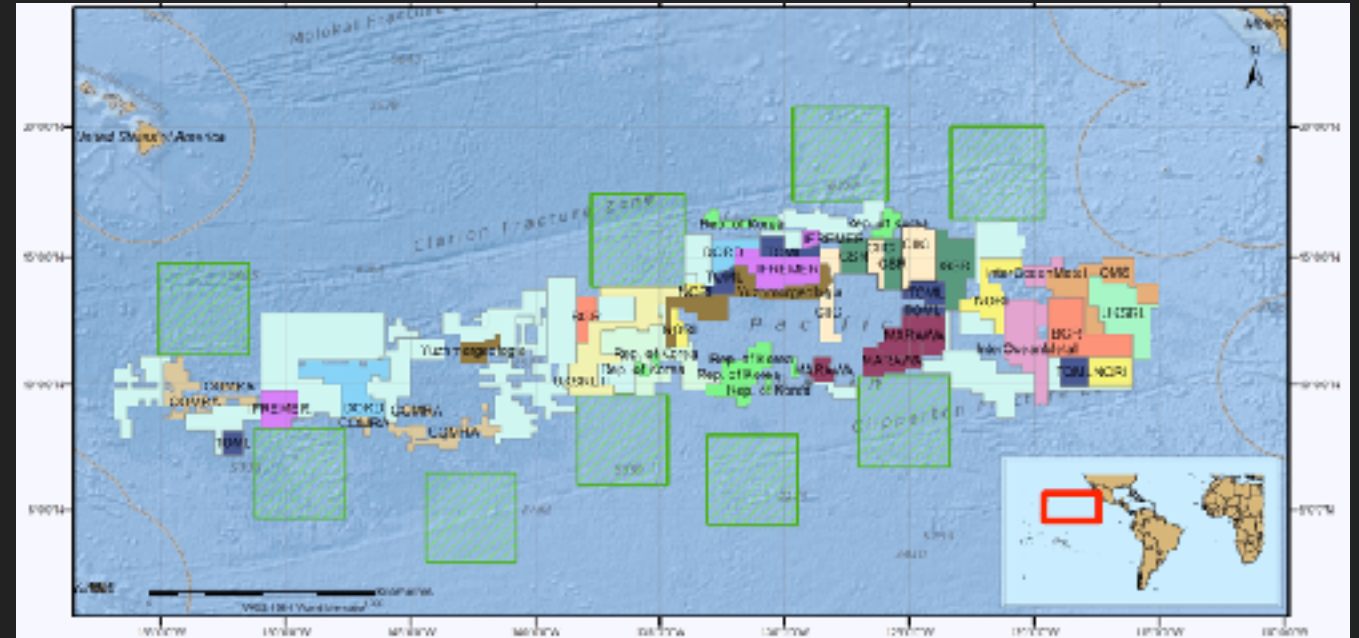


Timm Schoening

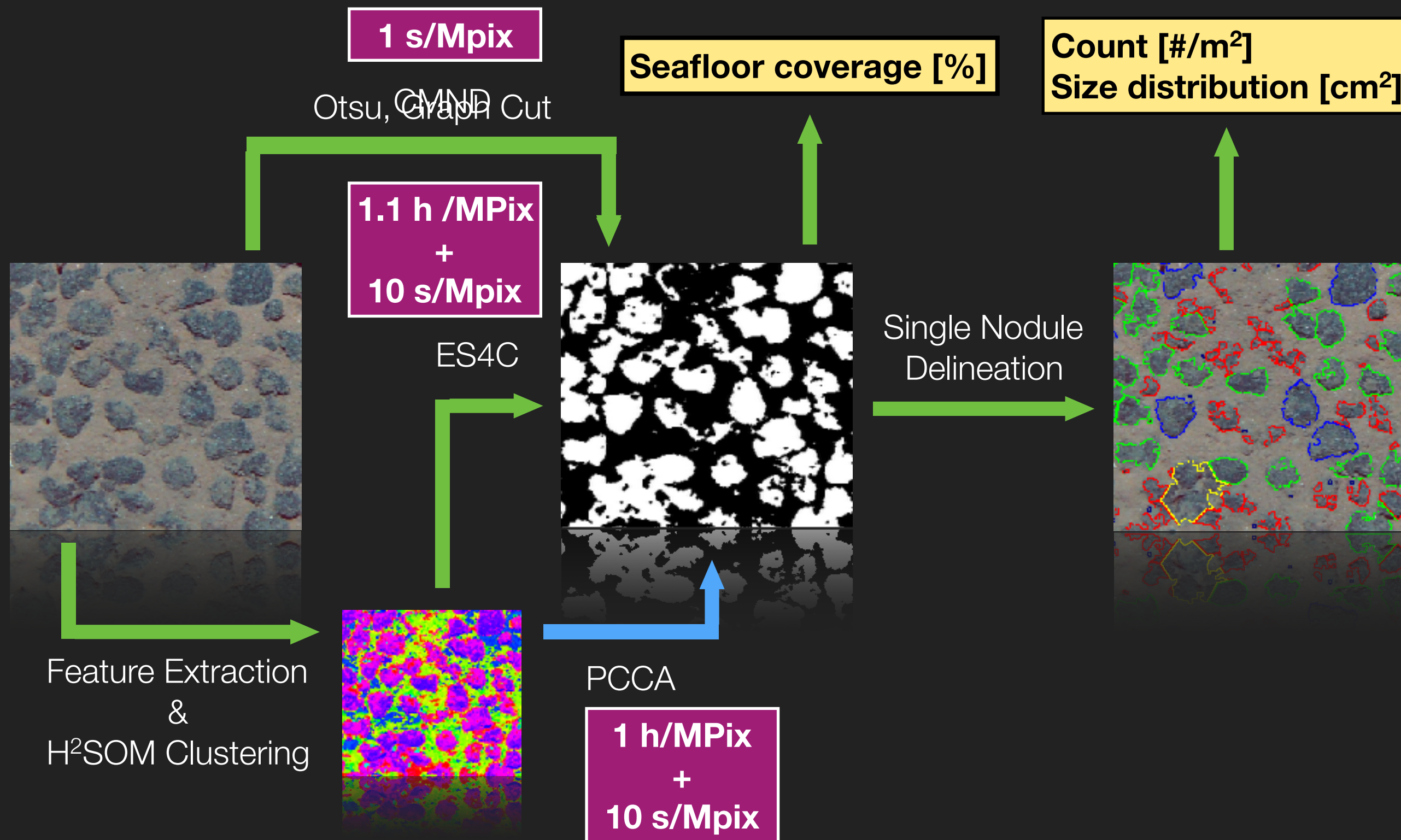
Comparison of automated nodule detection strategies

Marine mineral resource



Abundance assessment:

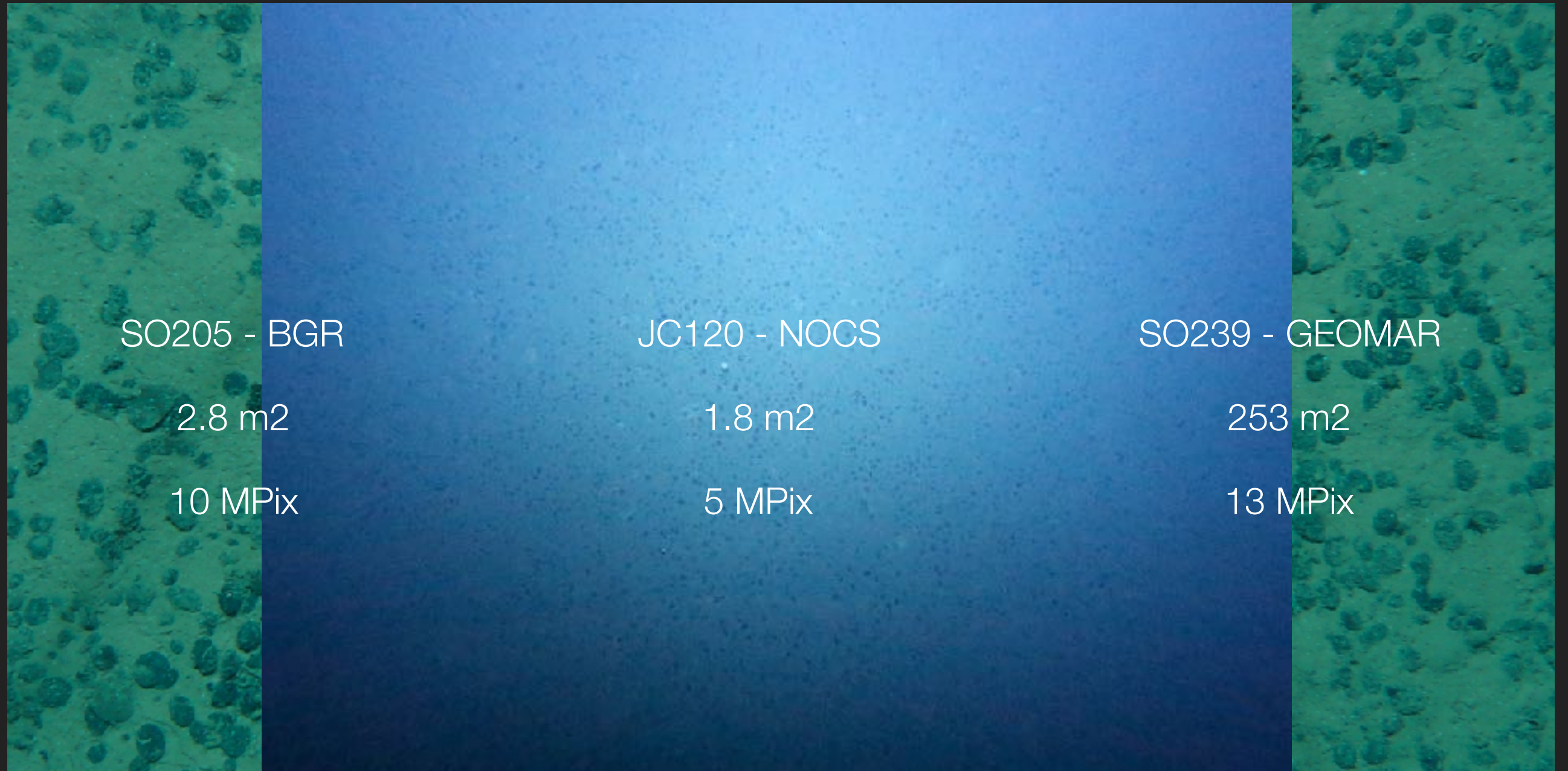
Seafloor coverage [%], Count [#/ m^2], Size distribution [cm^2]



PCCA

ES4C

CMND



SO205 - BGR

2.8 m²

10 MPix

JC120 - NOCS

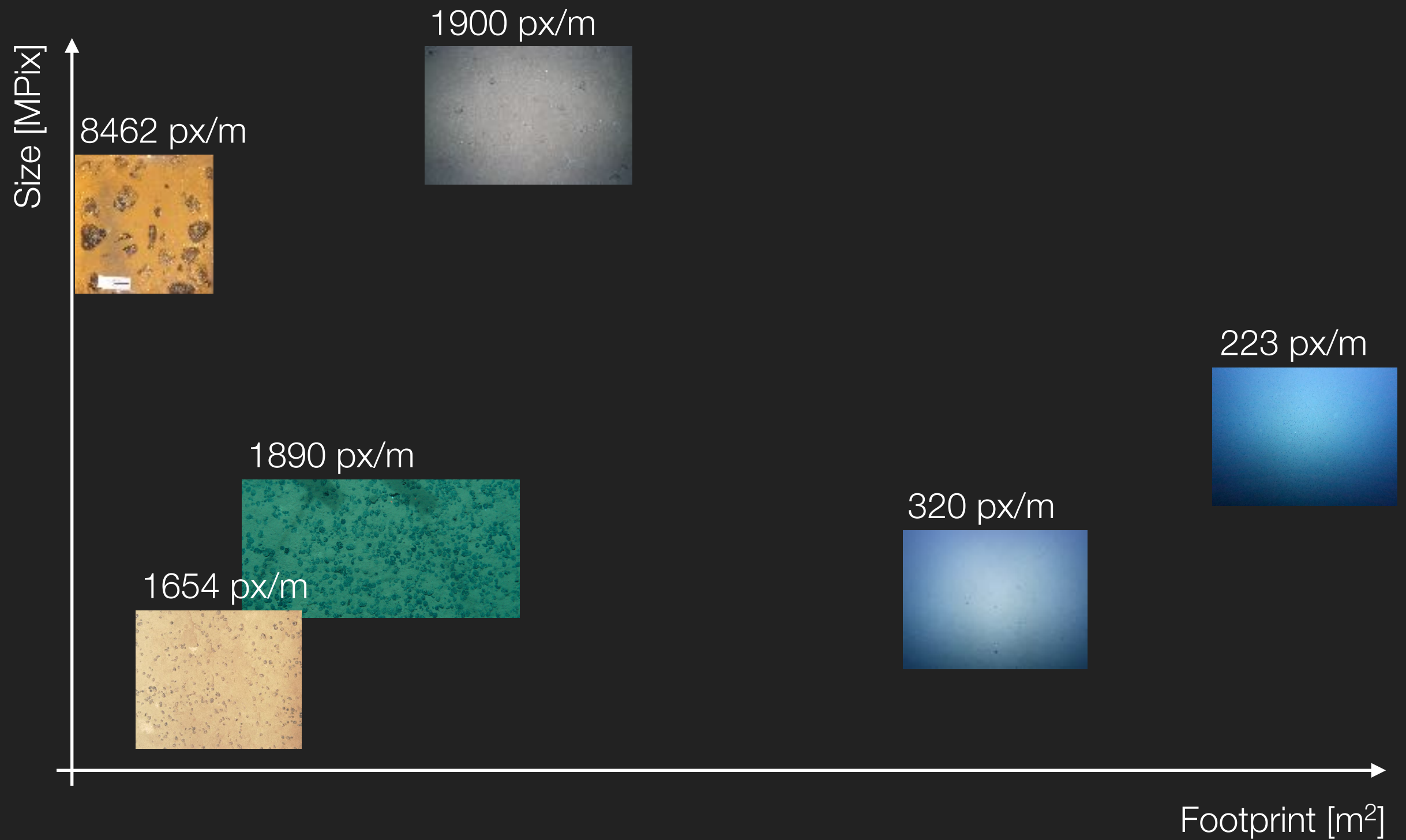
1.8 m²

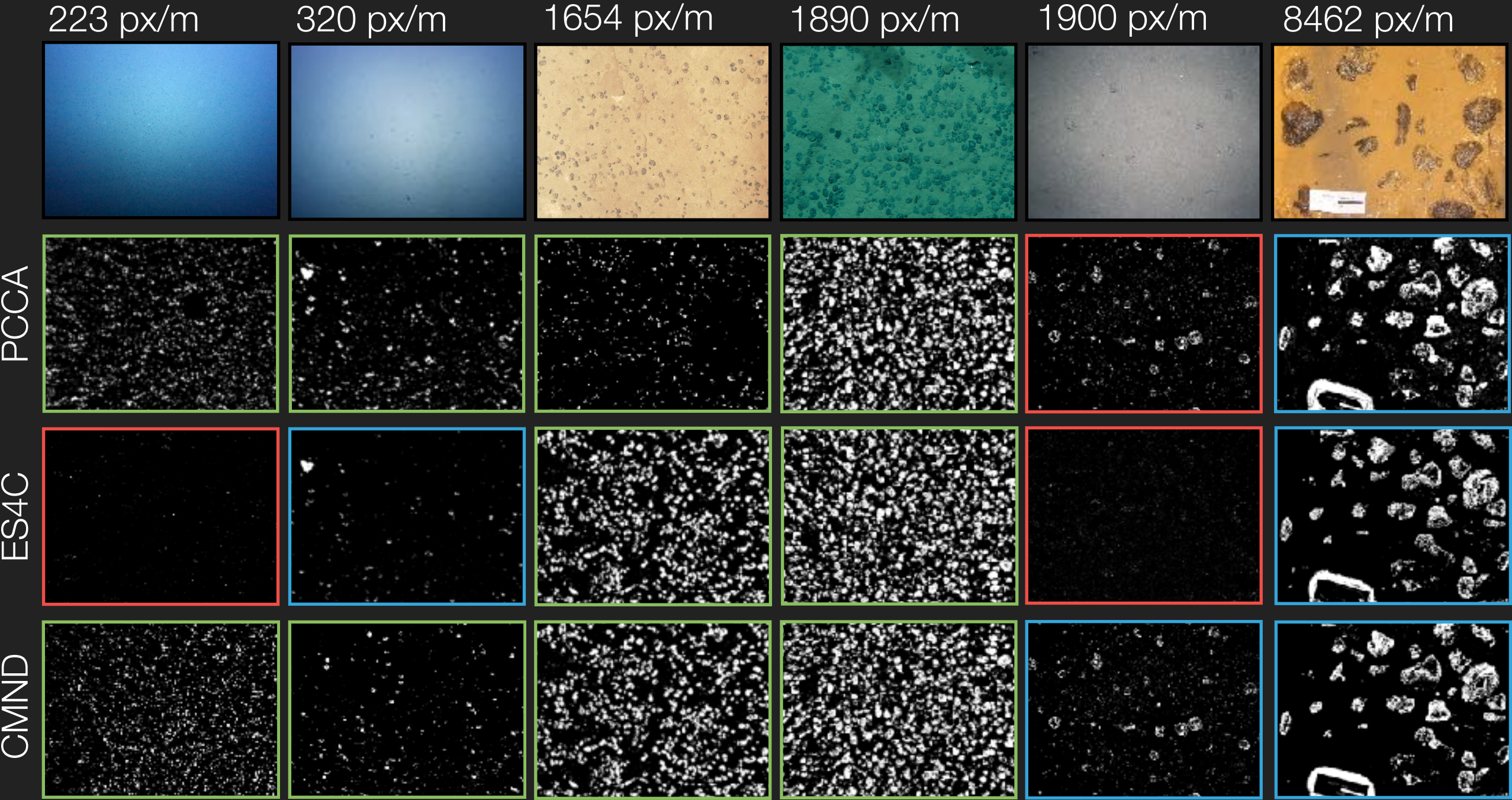
5 MPix

SO239 - GEOMAR

253 m²

13 MPix







H2SOM fails to find meaningful clustering -> PCCA & ES4C fail as well



CMND shows some success but has large gaps

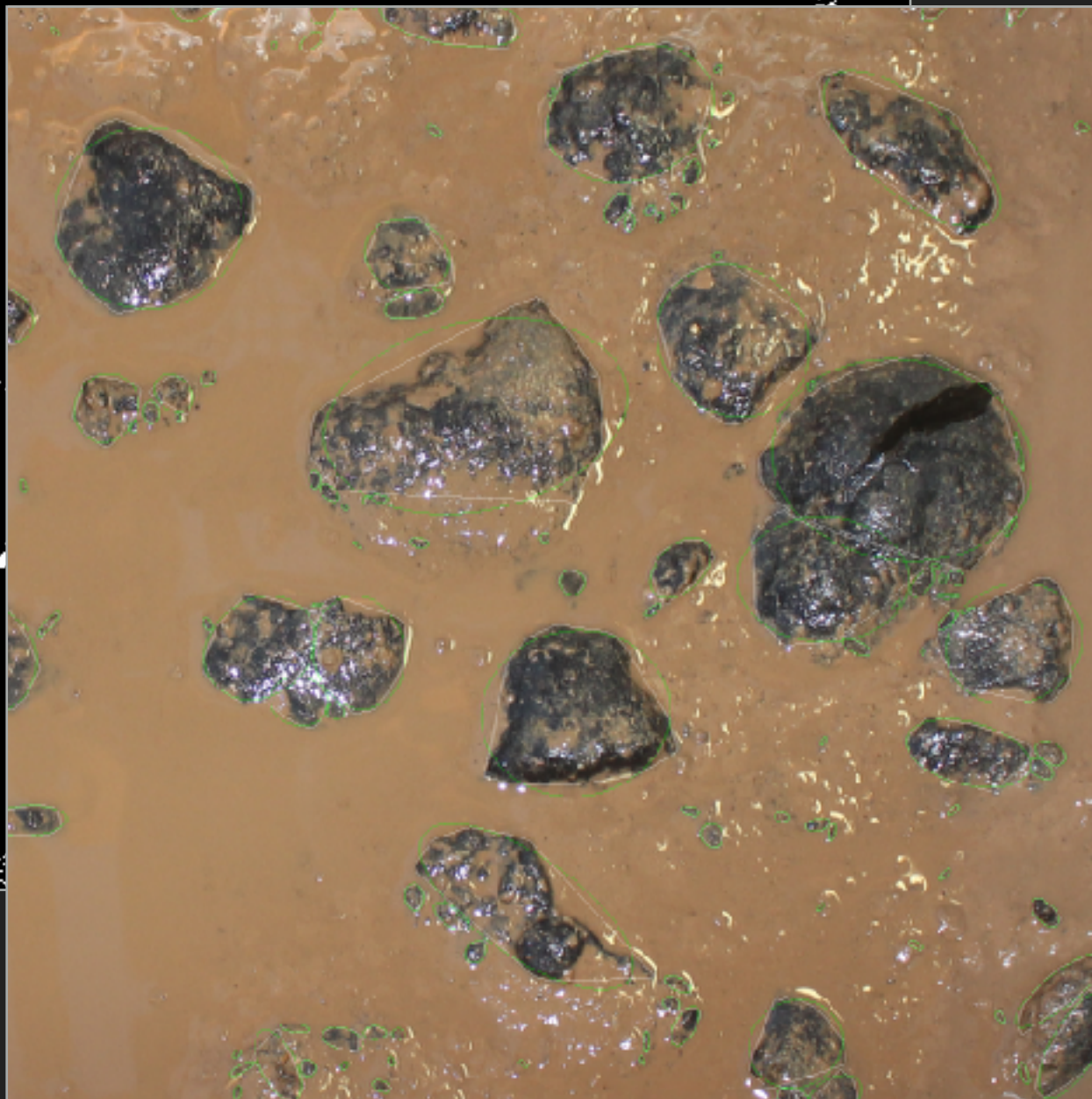


Single Nodule Delineation after CMND fails to capture true nodule extents

ES4C fails to separate nodules and background

ES4C selects clusters that represent shadows below nodules rather than nodules themselves

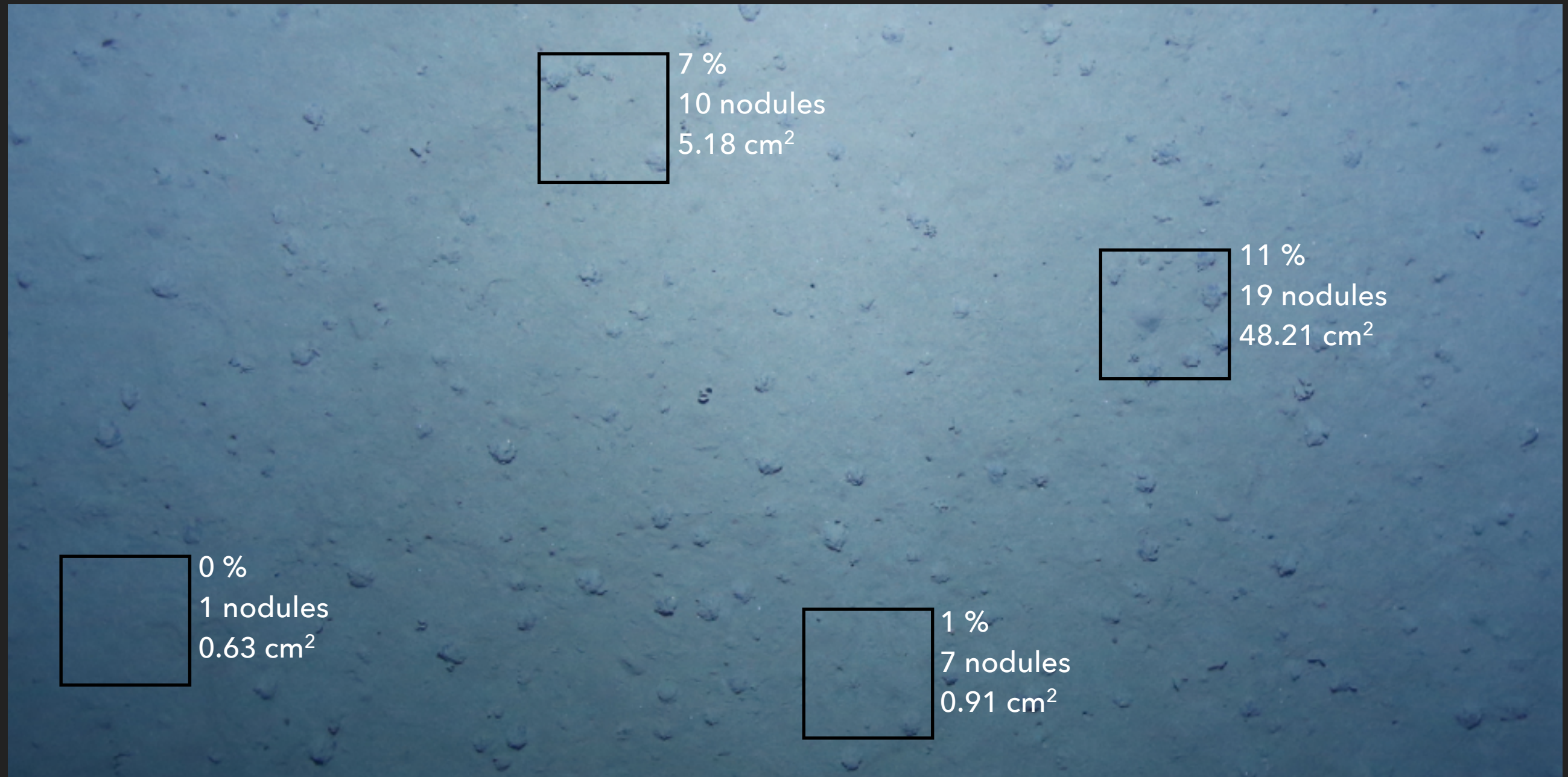
Single Nodule Delineation after PCCA / ES4C / CMND fails to capture true nodule extents

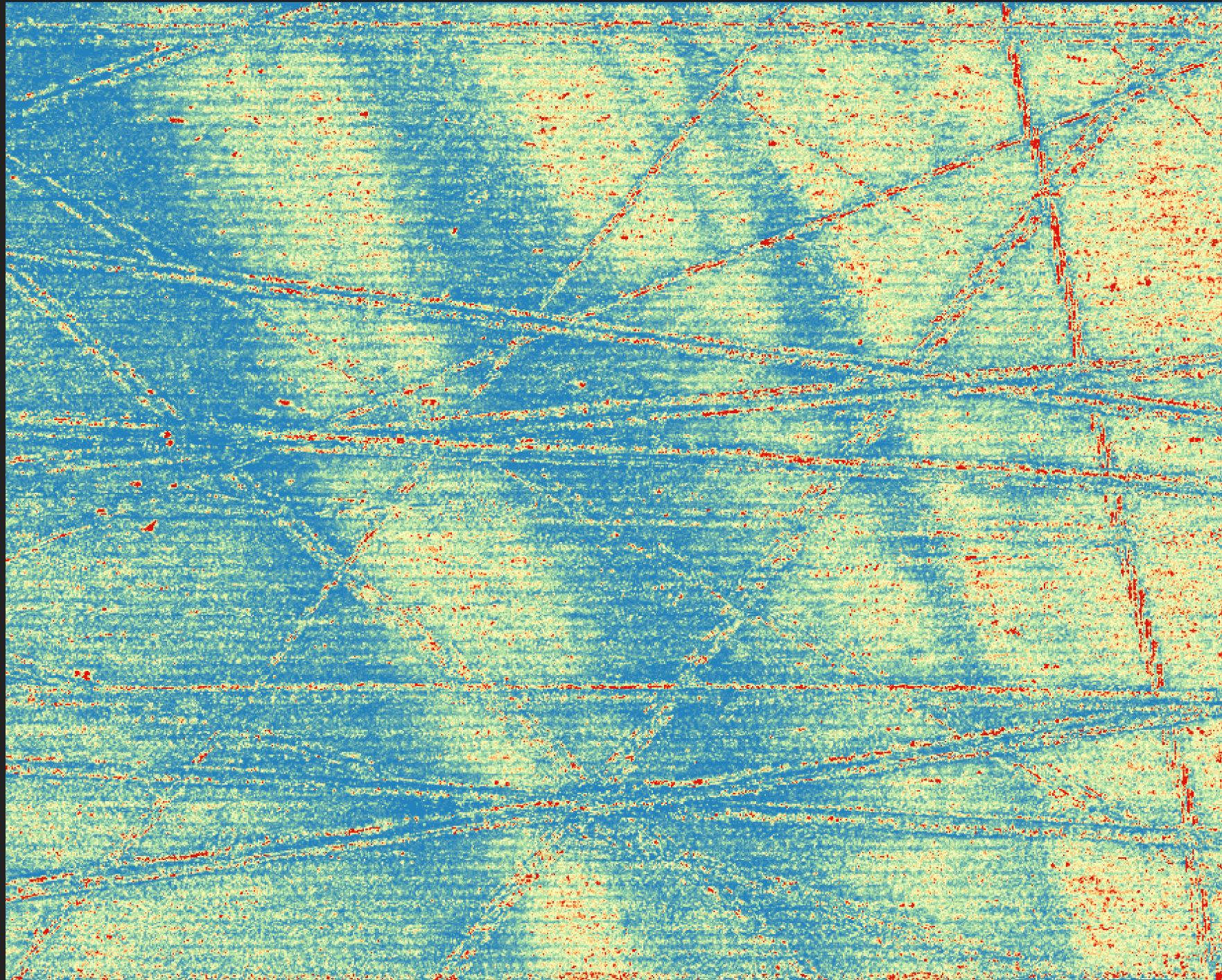


“No one wants to
annotate the *****
nodules”

Anonymous, yet present

Name	Type	Resolution	Size	Images
BC239	Sample	8492	0.2	23
OO242	Transect	1901	5.5	847
OO205	Transect	1890	5.4	838
AUV120	Transect	1654	1.3	2000
AUV242	Mosaic	320	18.1	10727
AUV239	Mosaic	223	84.8	9548

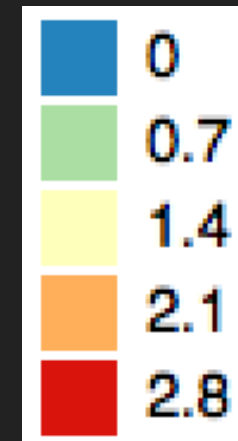




Area:
520x400 m

Resolution:
0.25x0.25 m

Nodule Coverage [%]





1. The discussed nodule detection algorithms operate on diverse image data sets
2. We should assemble baseline data sets to enable quantitative assessment of the algorithms
3. Baseline data derived from seafloor sampling may not be comparable