A CLASSIFICATION METHOD FOR THE PRESENCE OF TIDAL SAND WAVES AND MAINTENANCE DREDGING DESIGN

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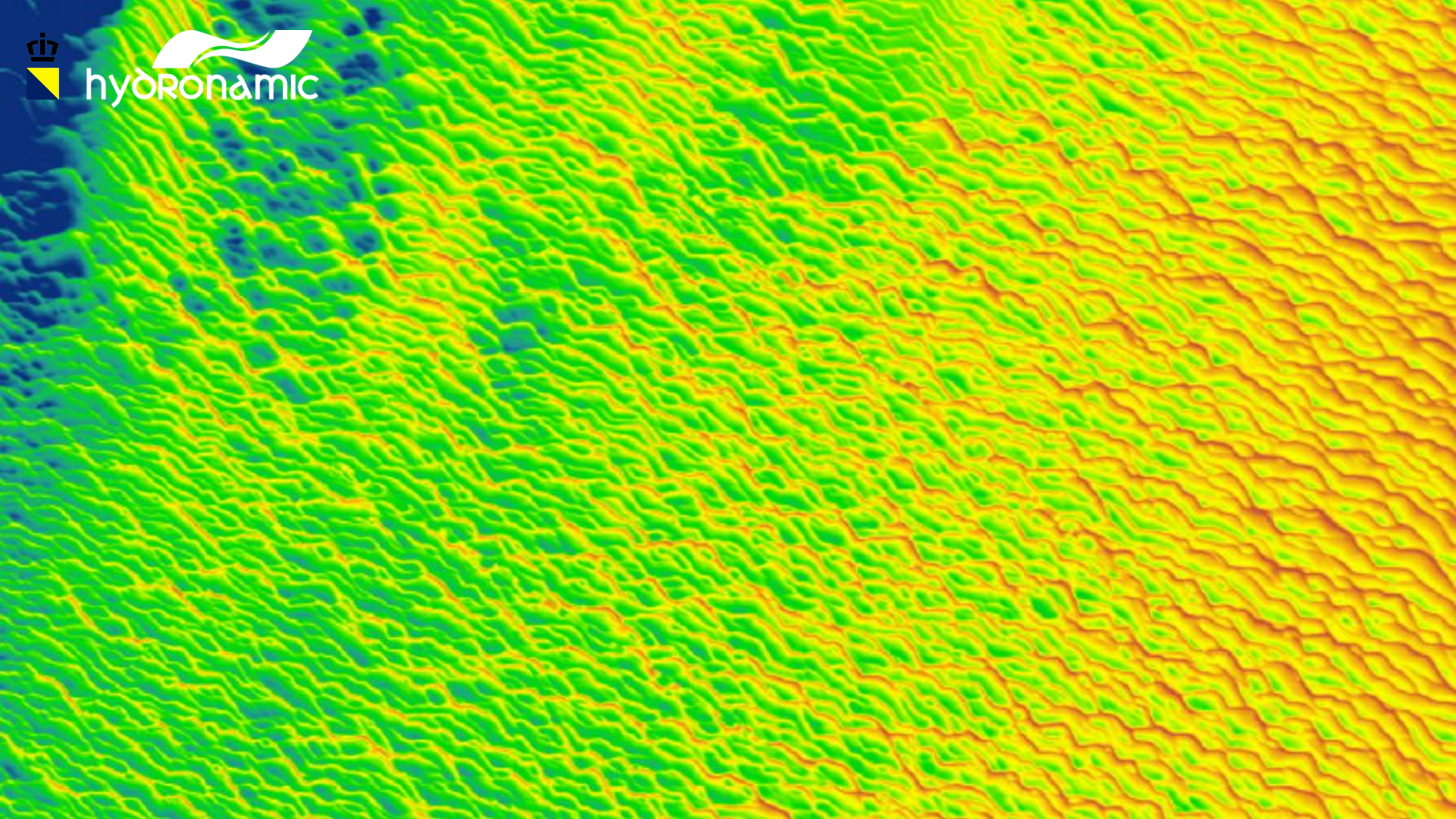
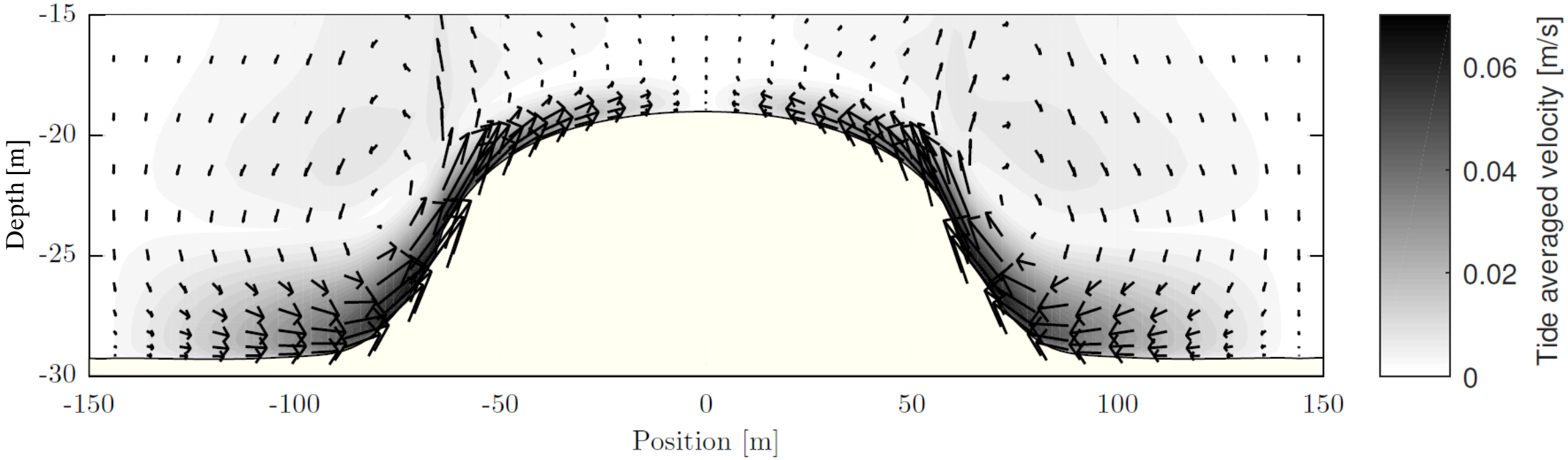

hydronamic



Van Gerwen, 2016

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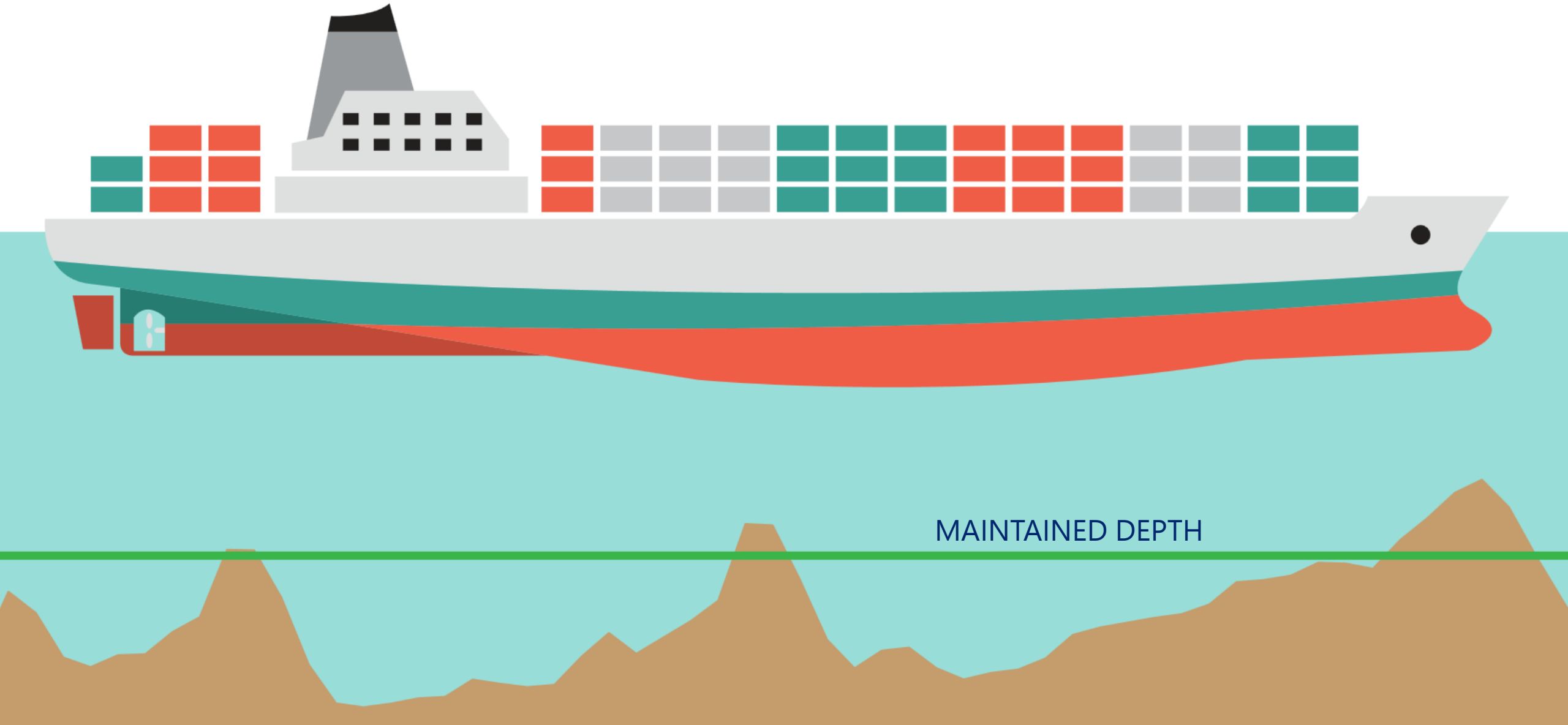
Herald Sun
QUEEN OF THE NETHERLANDS


MAINTAINED DEPTH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MELBOURNE
PORT PHILLIP BAY


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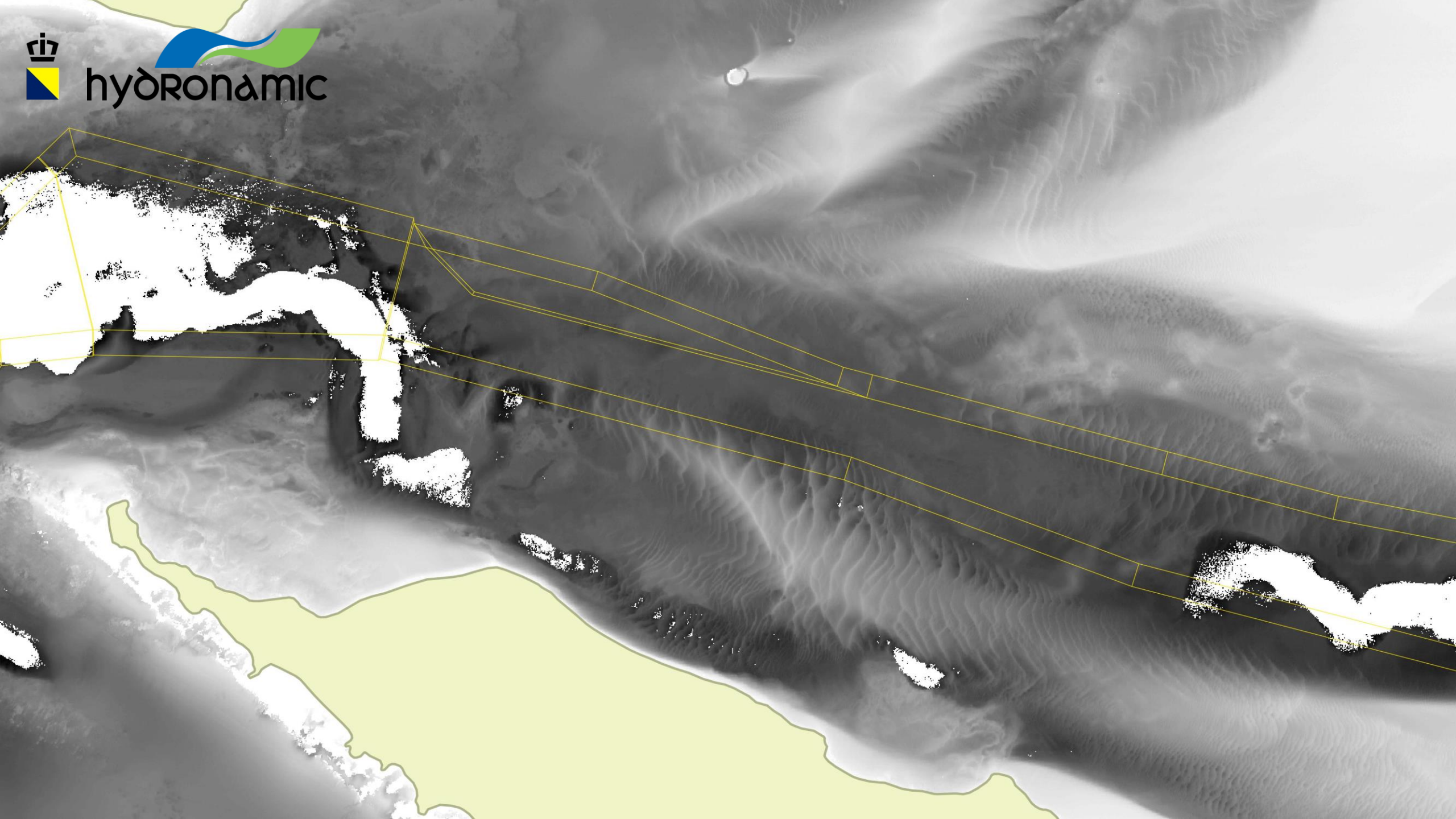
PORT PHILLIP BAY
SOUTH CHANNEL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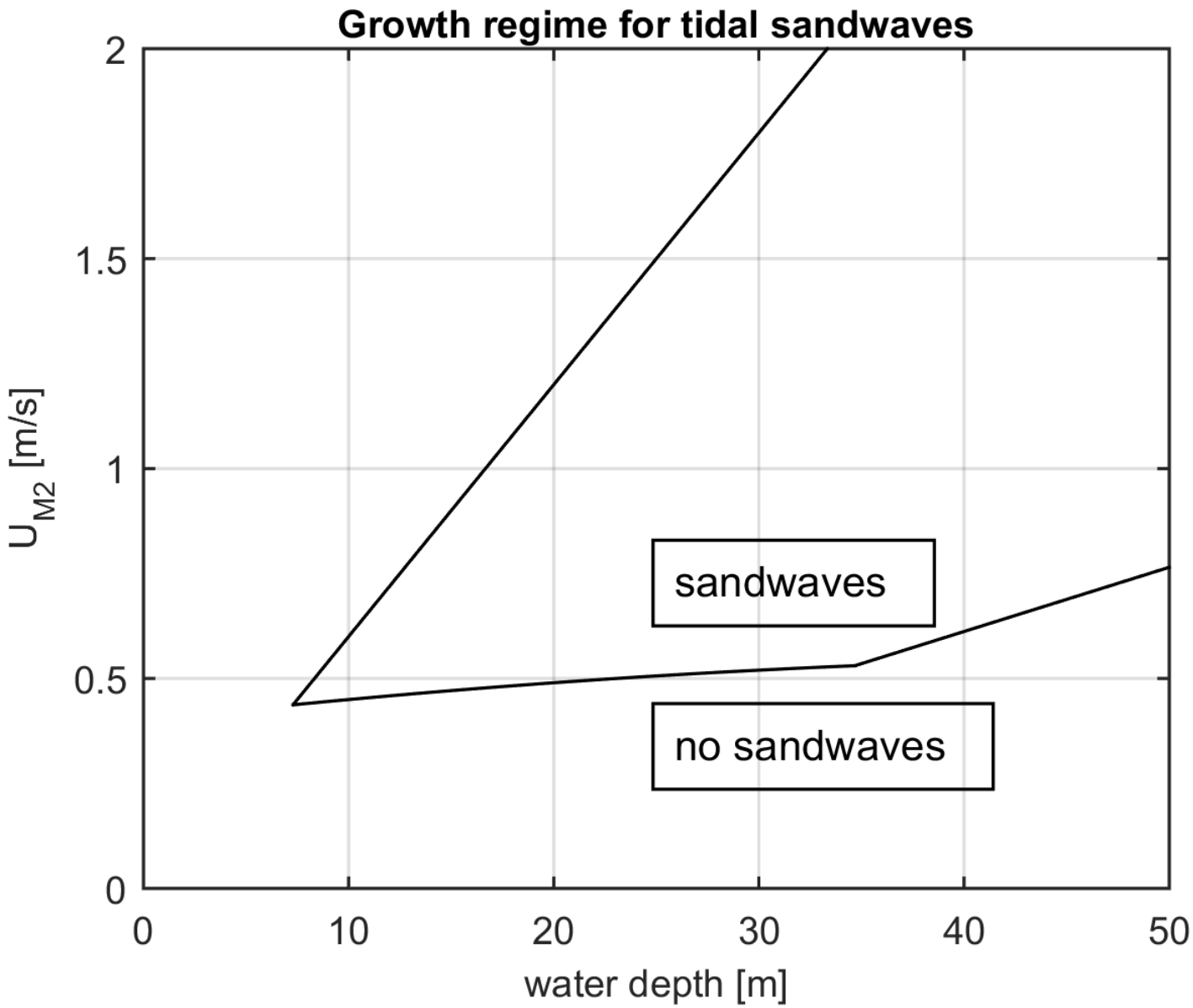
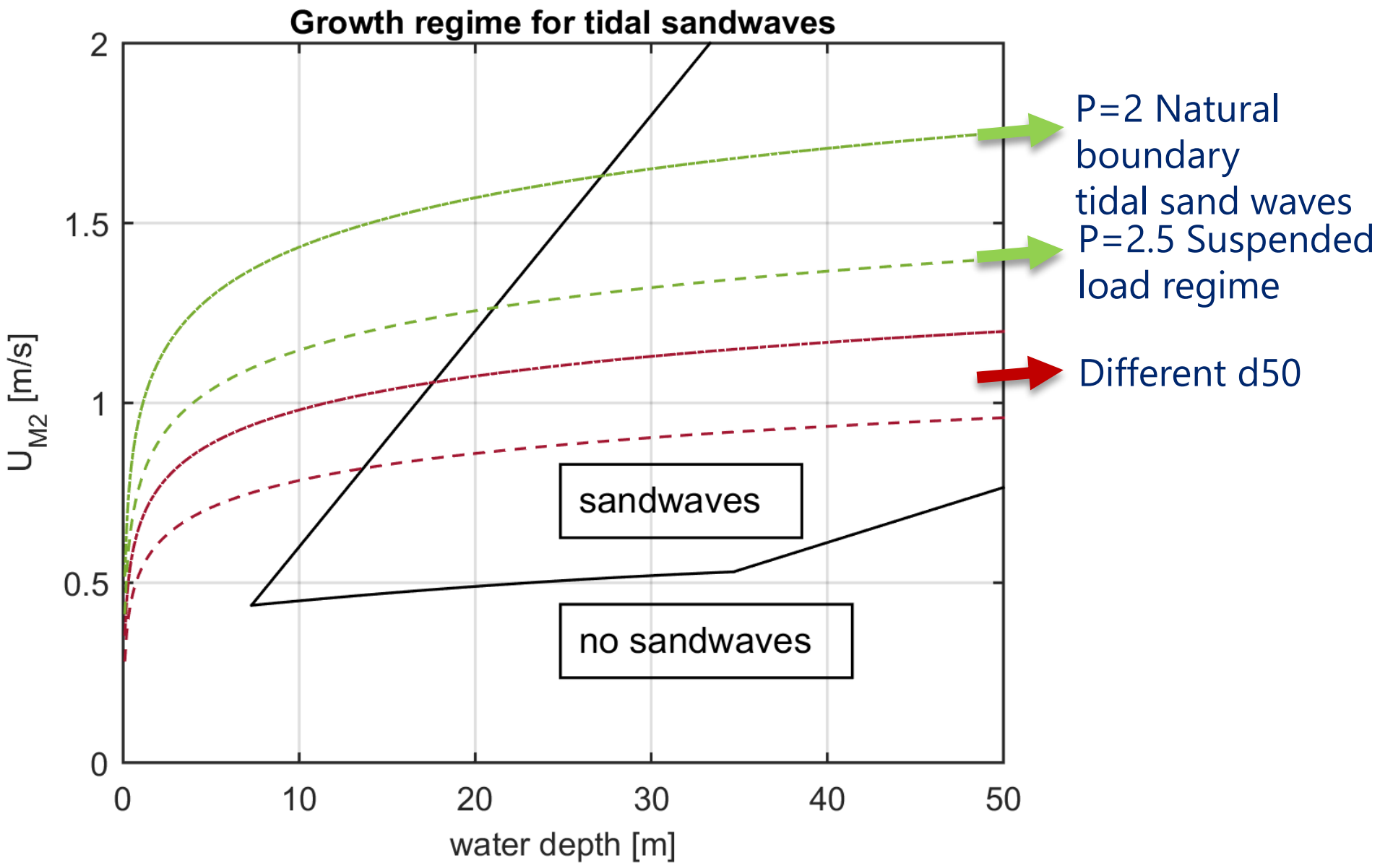
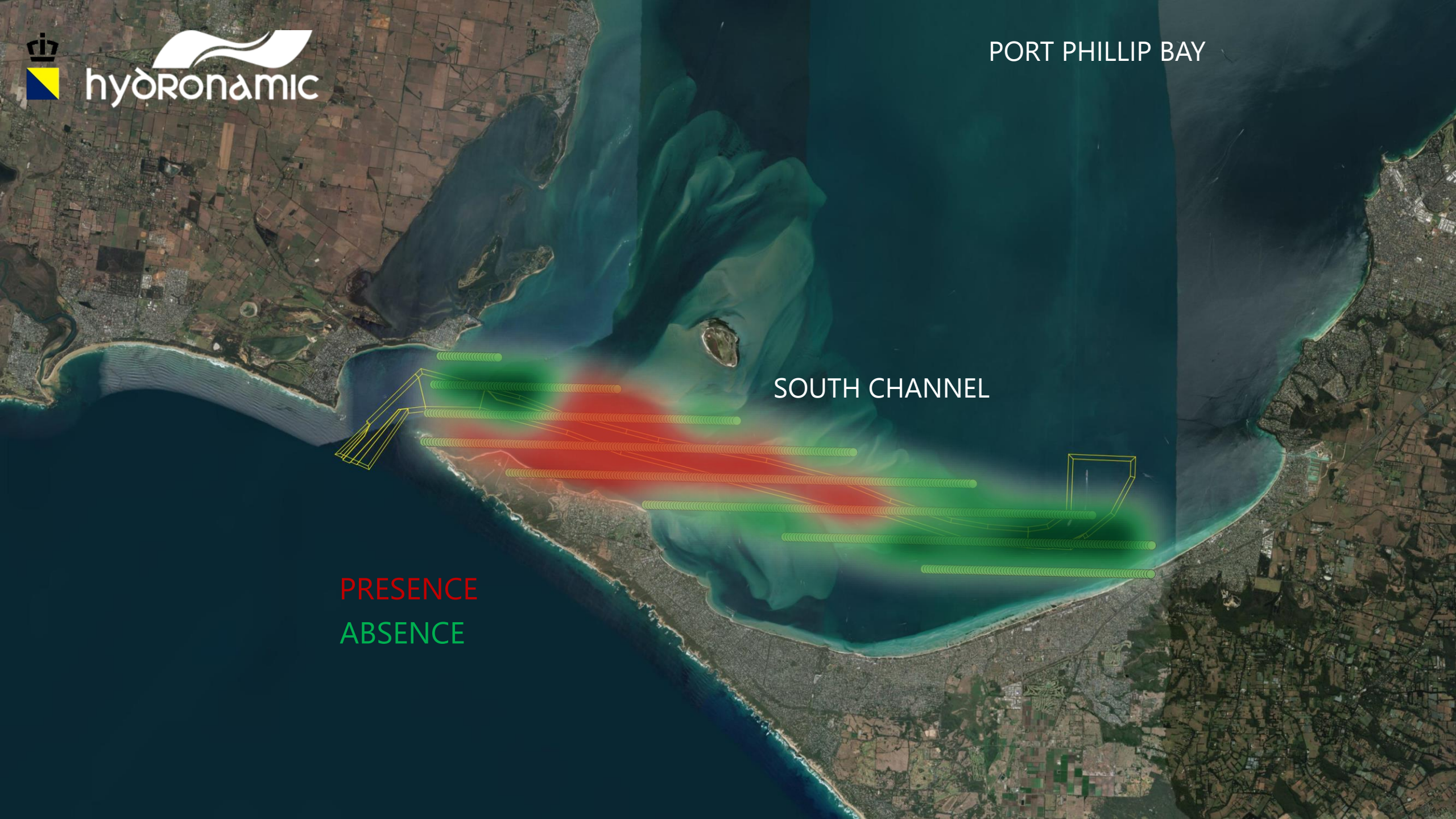

Growth regime for tidal sandwaves
2
1.5
1
0.5
0
U_{M2} [m/s]
0
10
20
30
40
50
water depth [m]
sandwaves
no sandwaves

Borsje (2009)



Borsje (2009), Borsje (2014)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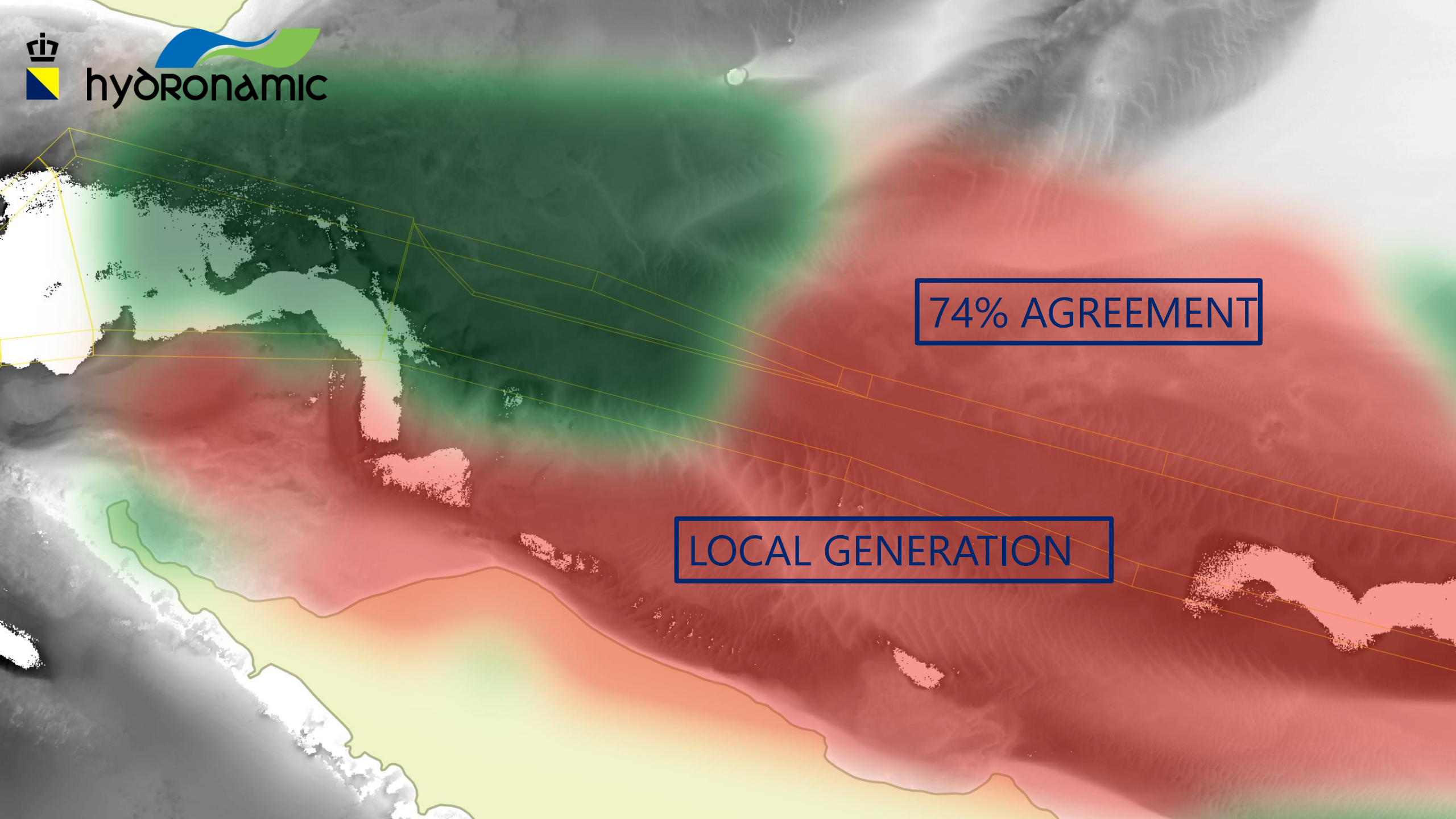
PORT PHILLIP BAY
SOUTH CHANNEL
PRESENCE
ABSENCE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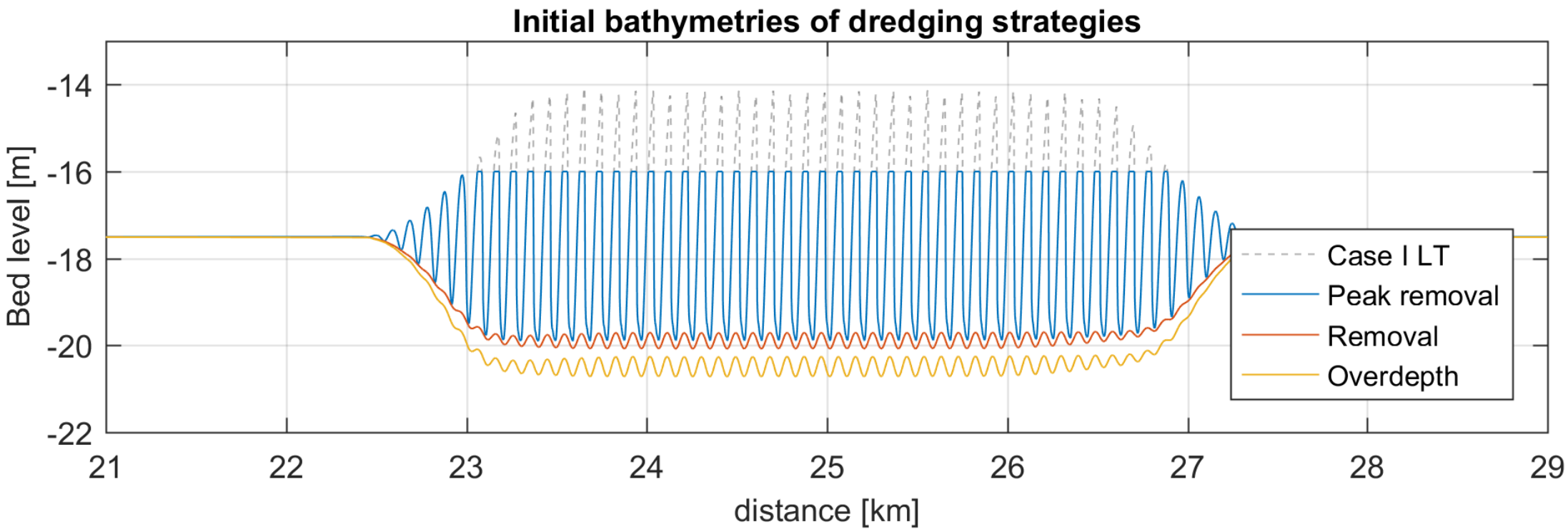
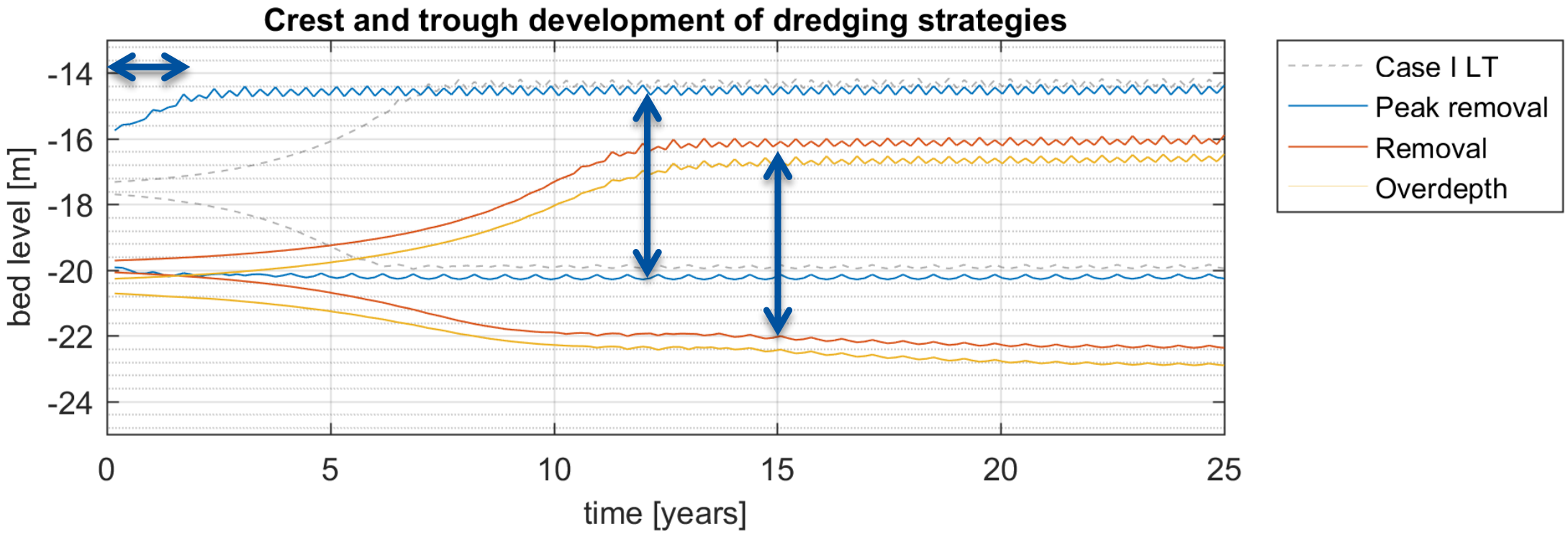
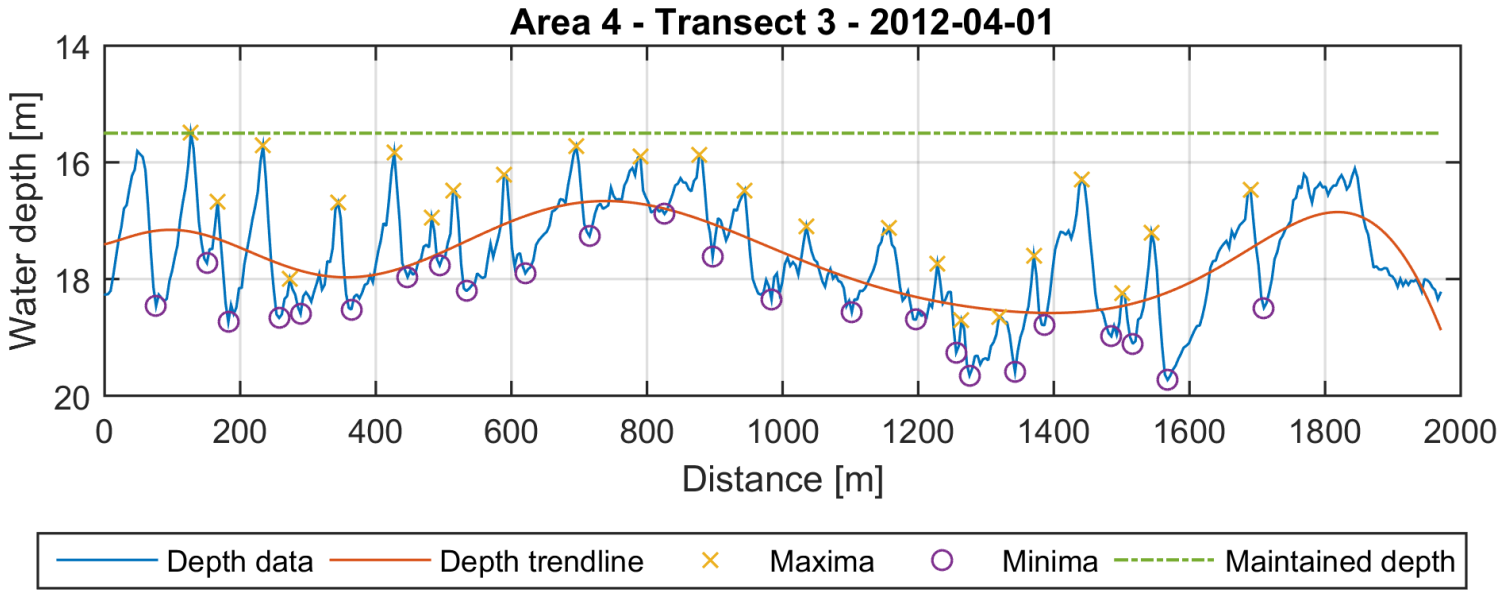
74% AGREEMENT
LOCAL GENERATION

MITIGATION VS PREVENTION

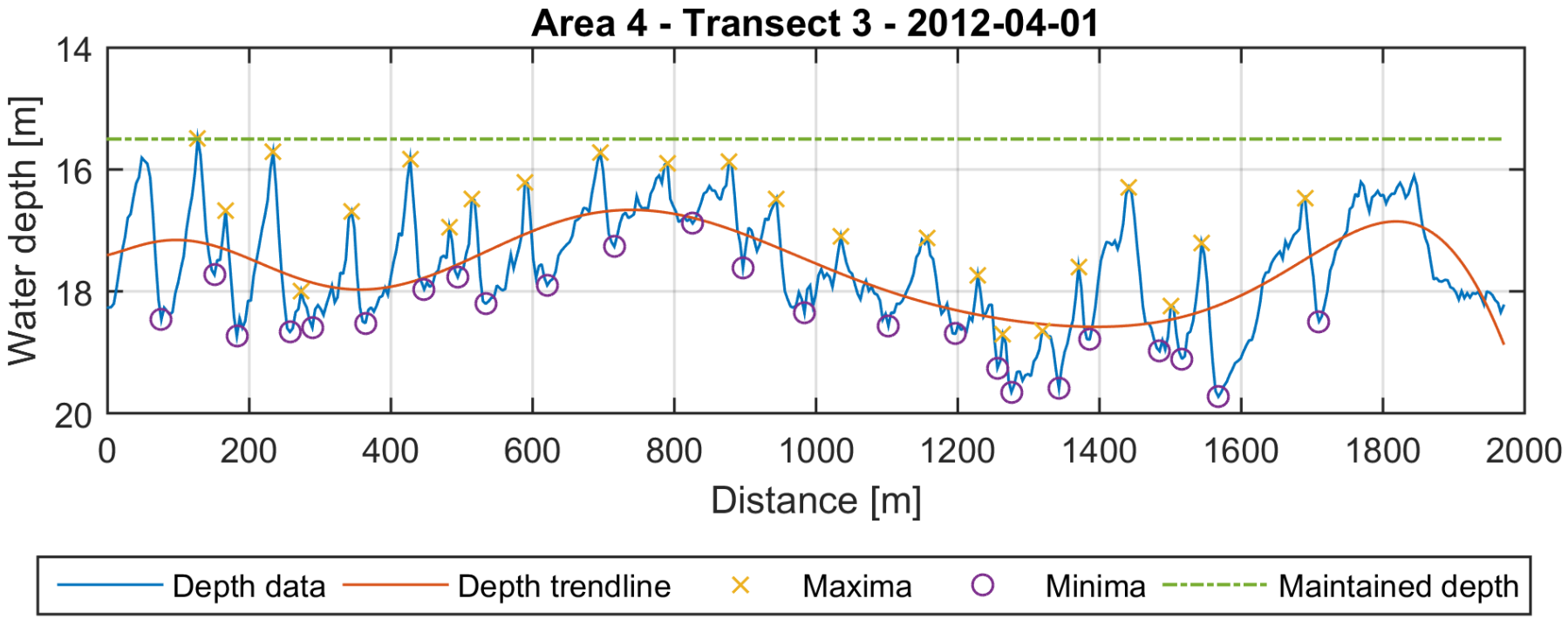

Initial bathymetries of dredging strategies
Bed level [m]
-14
-16
-18
-20
-22
21
22
23
24
25
26
27
28
29
distance [km]
Case I LT
Peak removal
Removal
Overdepth


Crest and trough development of dredging strategies
bed level [m]
-14
-16
-18
-20
-22
-24
0
5
10
15
20
25
time [years]
Case I LT
Peak removal
Removal
Overdepth



WAVEHEIGHT IN MODEL ≠ WAVEHEIGHT IN CHANNEL

NO INSIGHT IN BREACHING OF MAINTAINED DEPTH

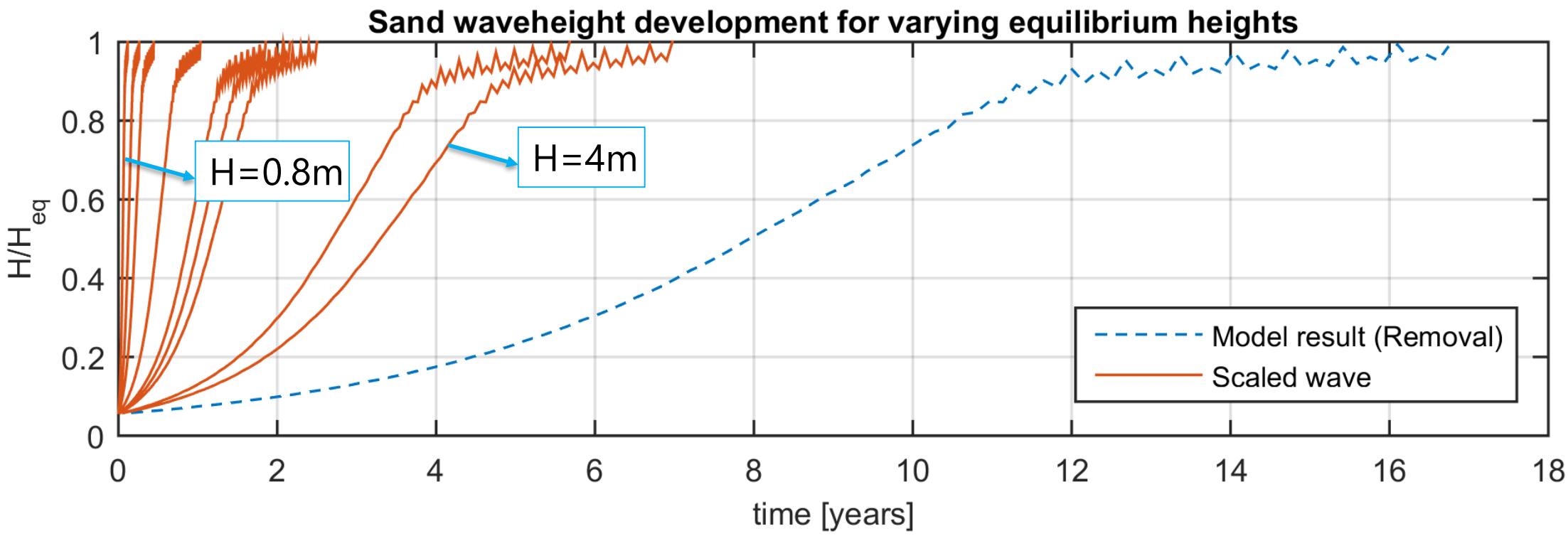


R

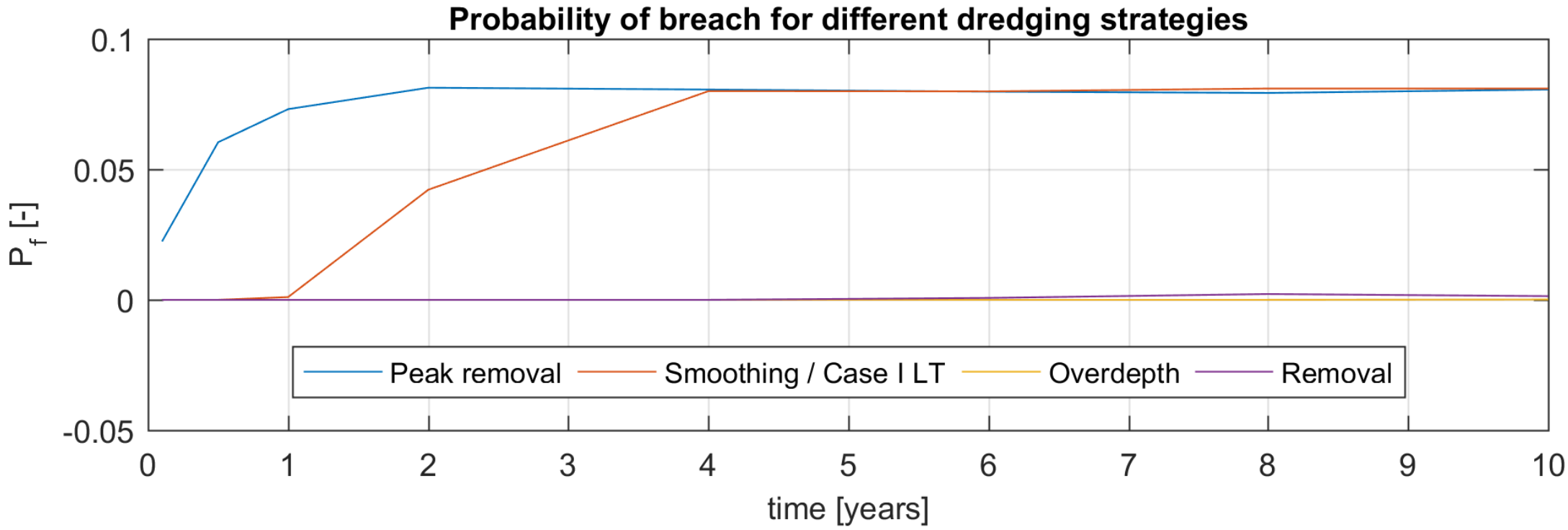
(μ,σ)

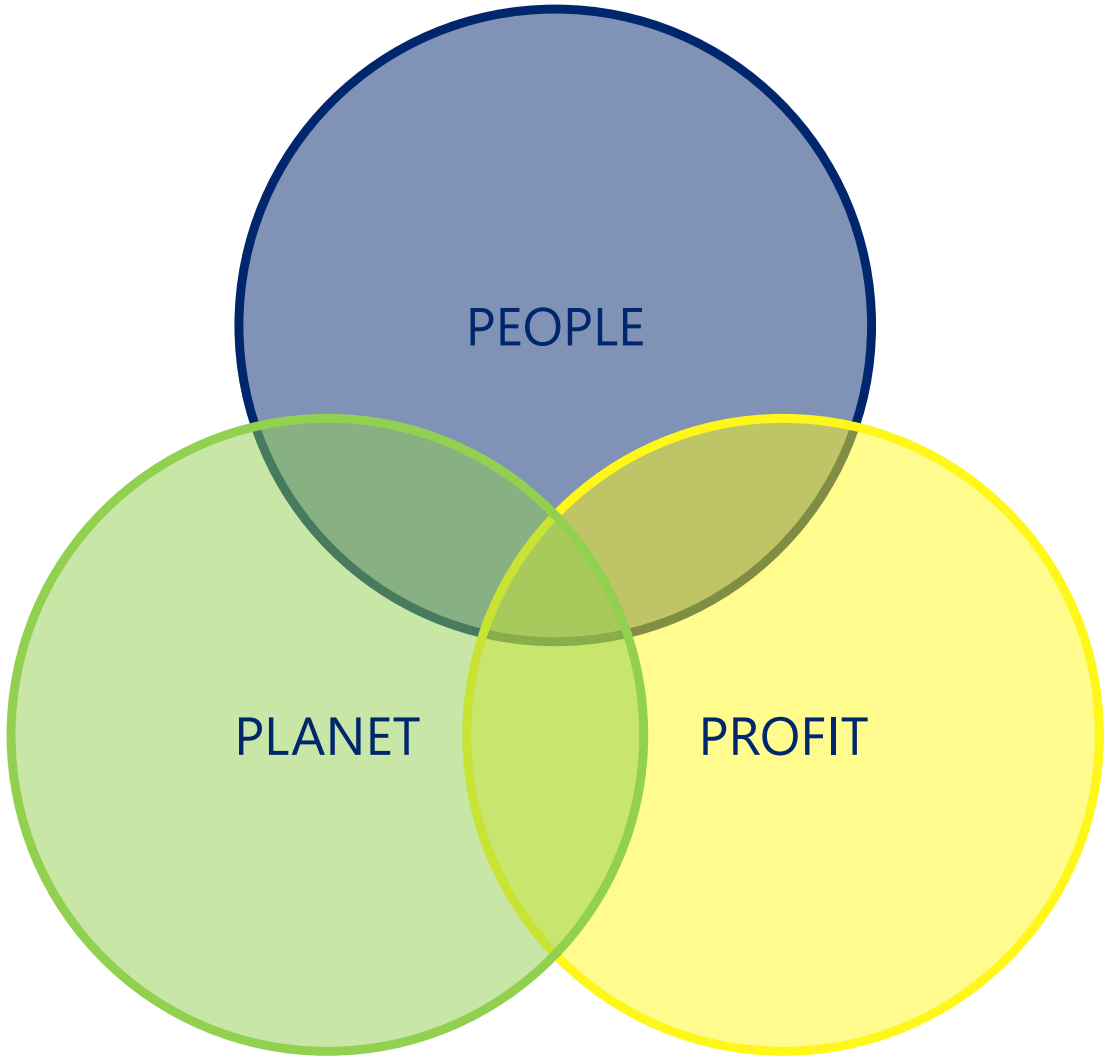
(μ,σ)

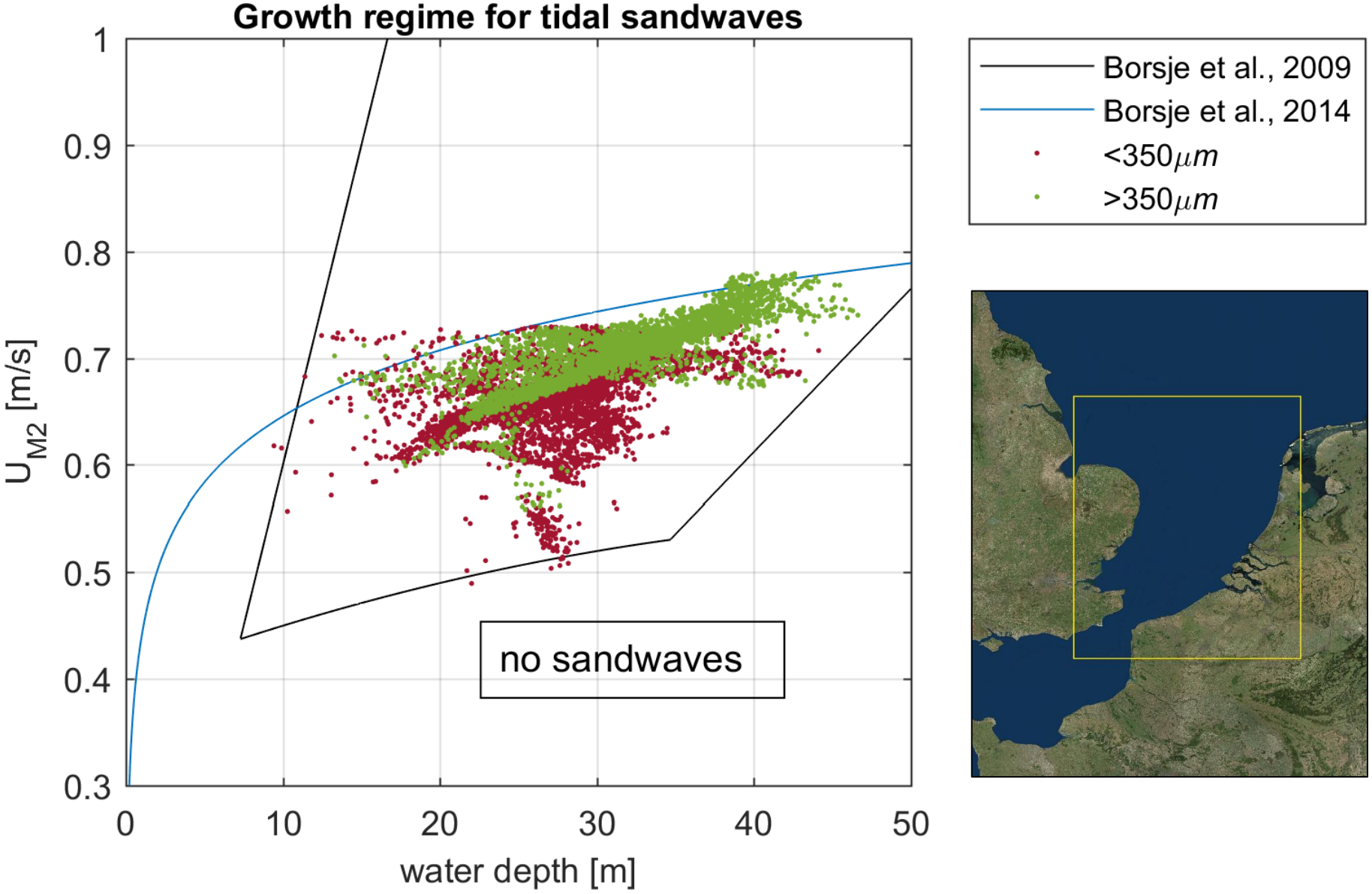
Z = MAINTAINED DEPTH – (MEAN BED + SAND WAVE AMPLITUDE)


Sand waveheight development for varying equilibrium heights
H/H_eq
time [years]
H=0.8m
H=4m
Model result (Removal)
Scaled wave
0
0.2
0.4
0.6
0.8
1
0
2
4
6
8
10
12
14
16
18

CURRENT PROBABILITY OF BREACHING = 7%

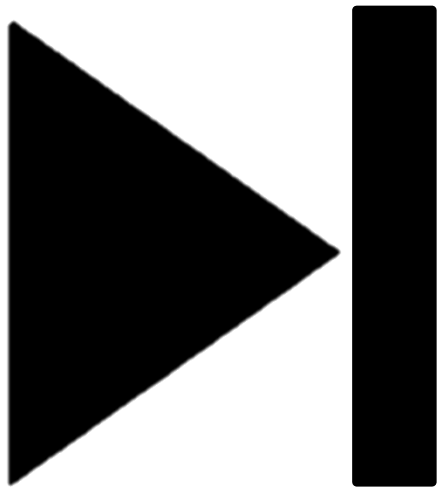



PEOPLE
PLANET
PROFIT



Borsje (2009), Borsje (2014)

hydronamic

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