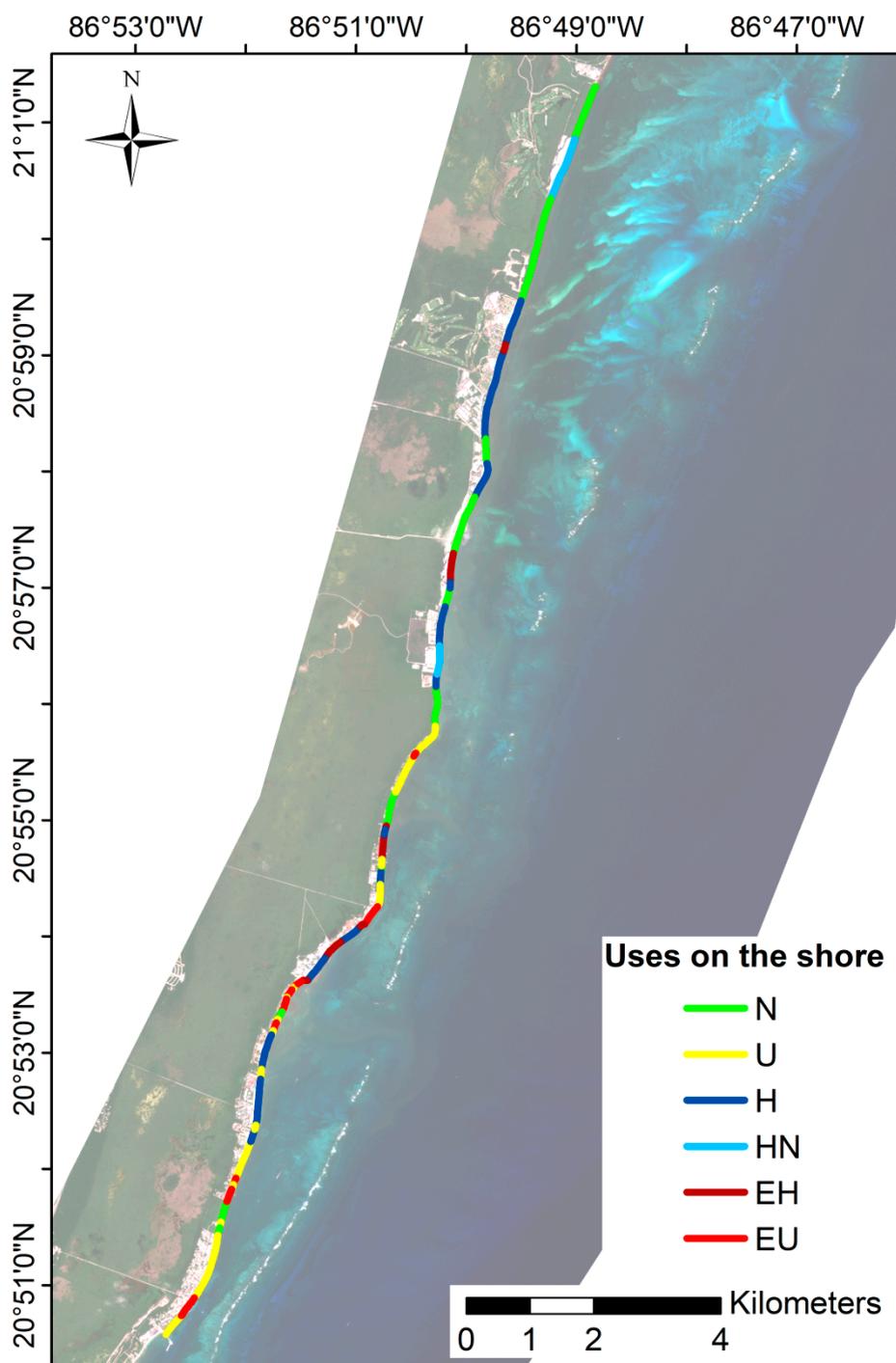


## Supplementary Material

### 1.1 Supplementary Figures

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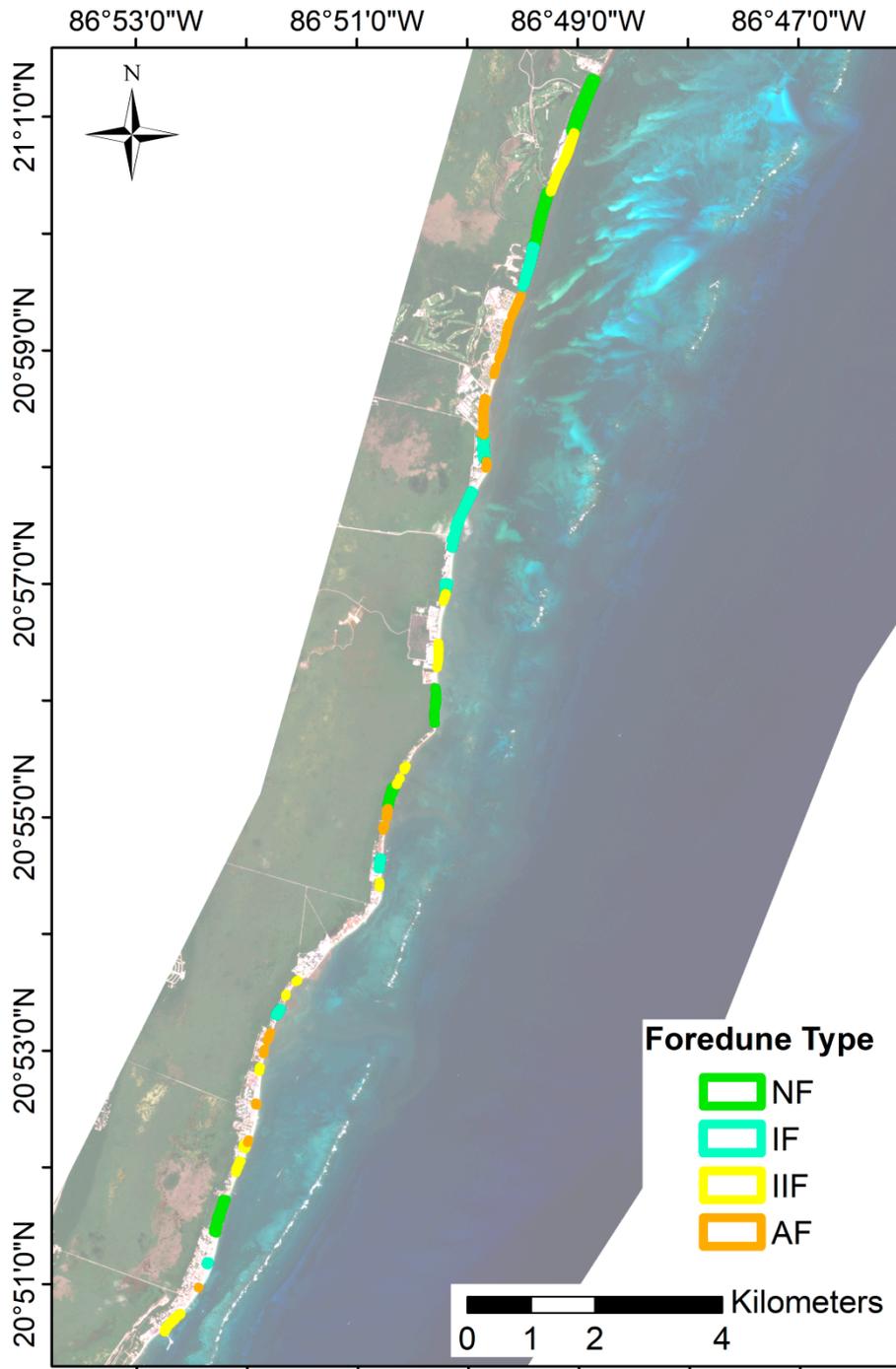
**Figure S1.** Land use on PNAPM shore (December 2022): N = Natural; U = Urban; H = Hotel; HN = Hotel New; EH = Erosion Hotel; EU = Erosion Urban.

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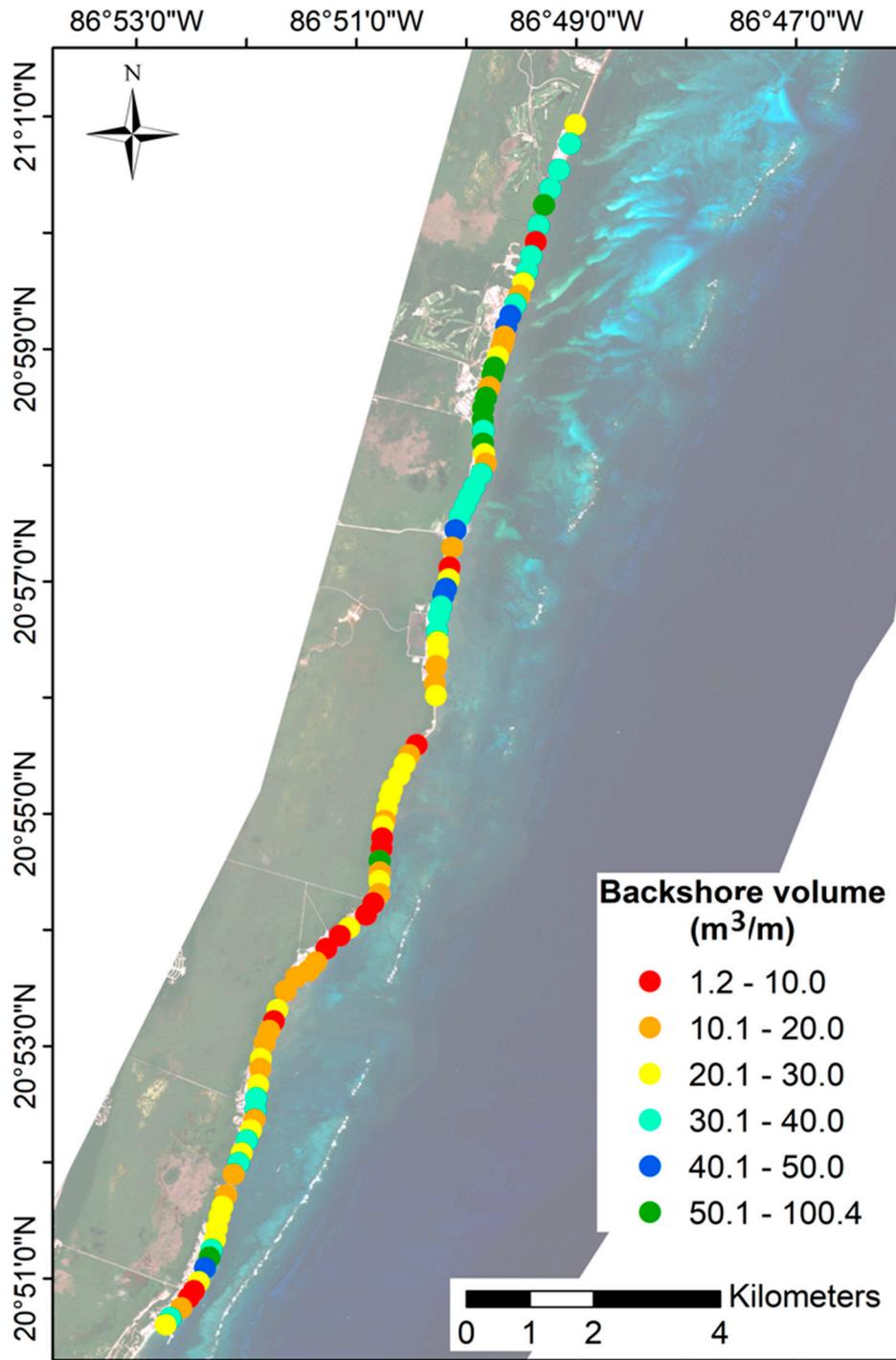
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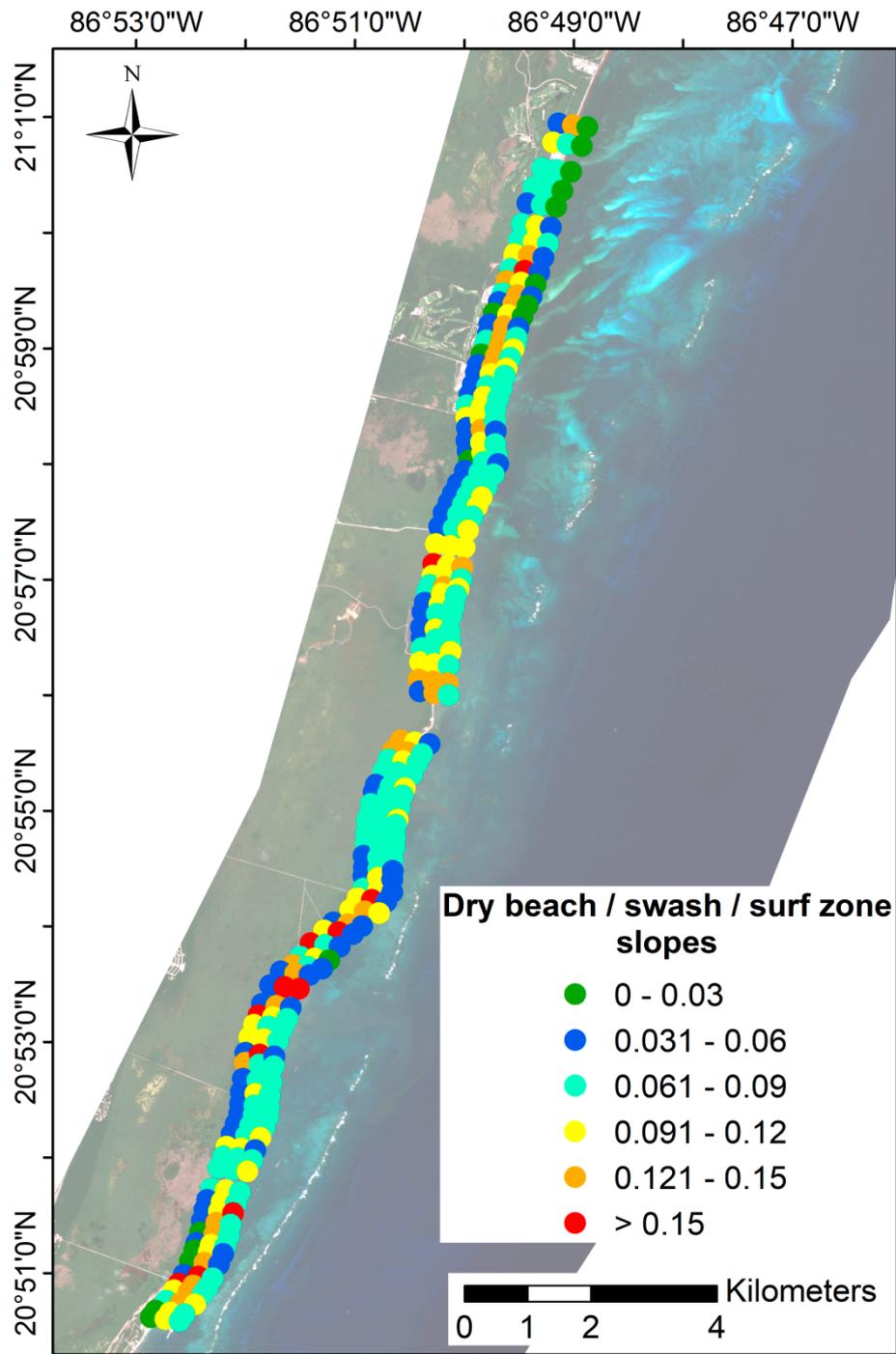


**Figure S2.** Locations of the foredune areas in PNAPM, January 2023: AF= artificial; NF=natural; IF= interrupted; IIF= interrupted and impacted.

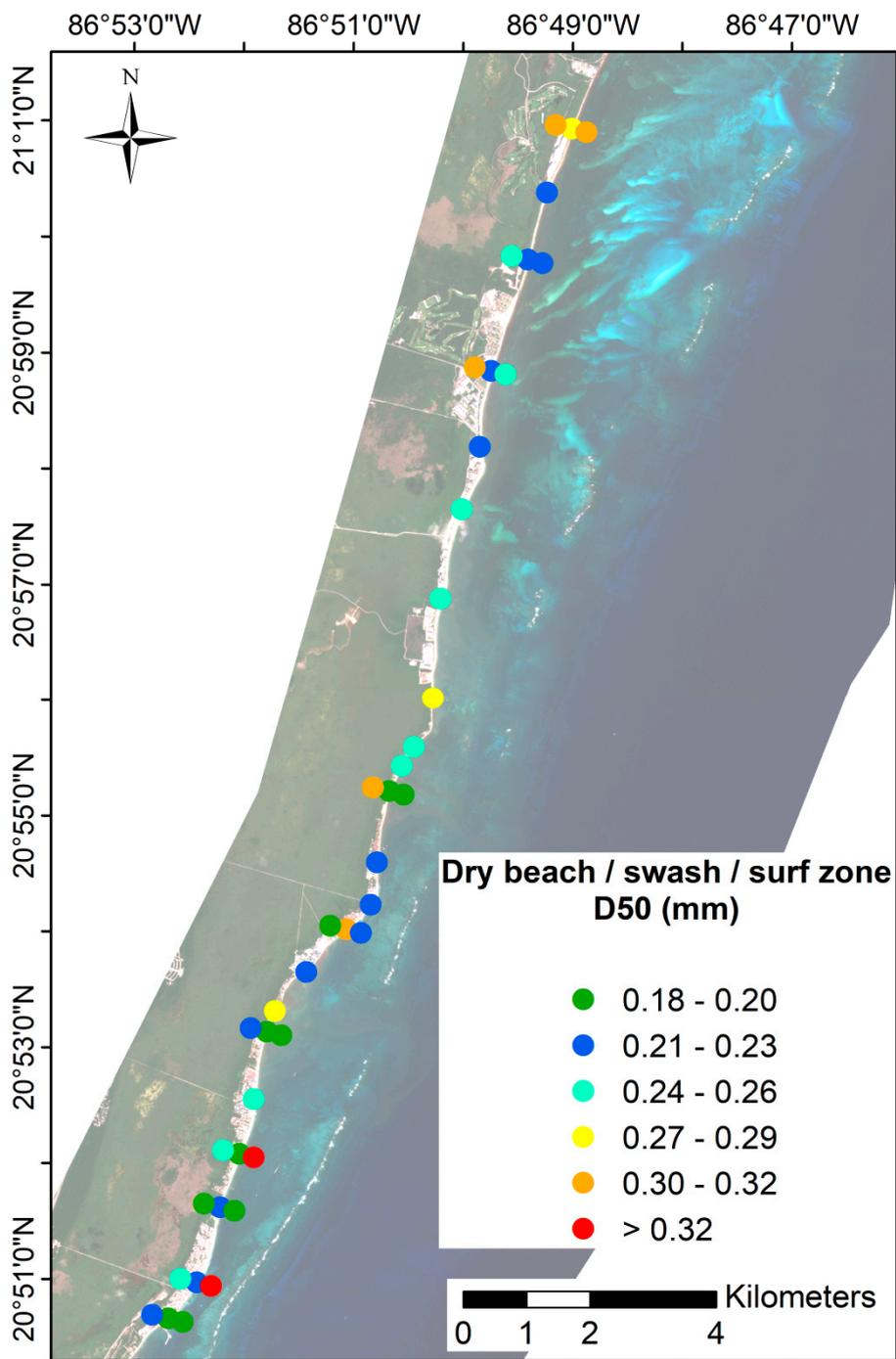
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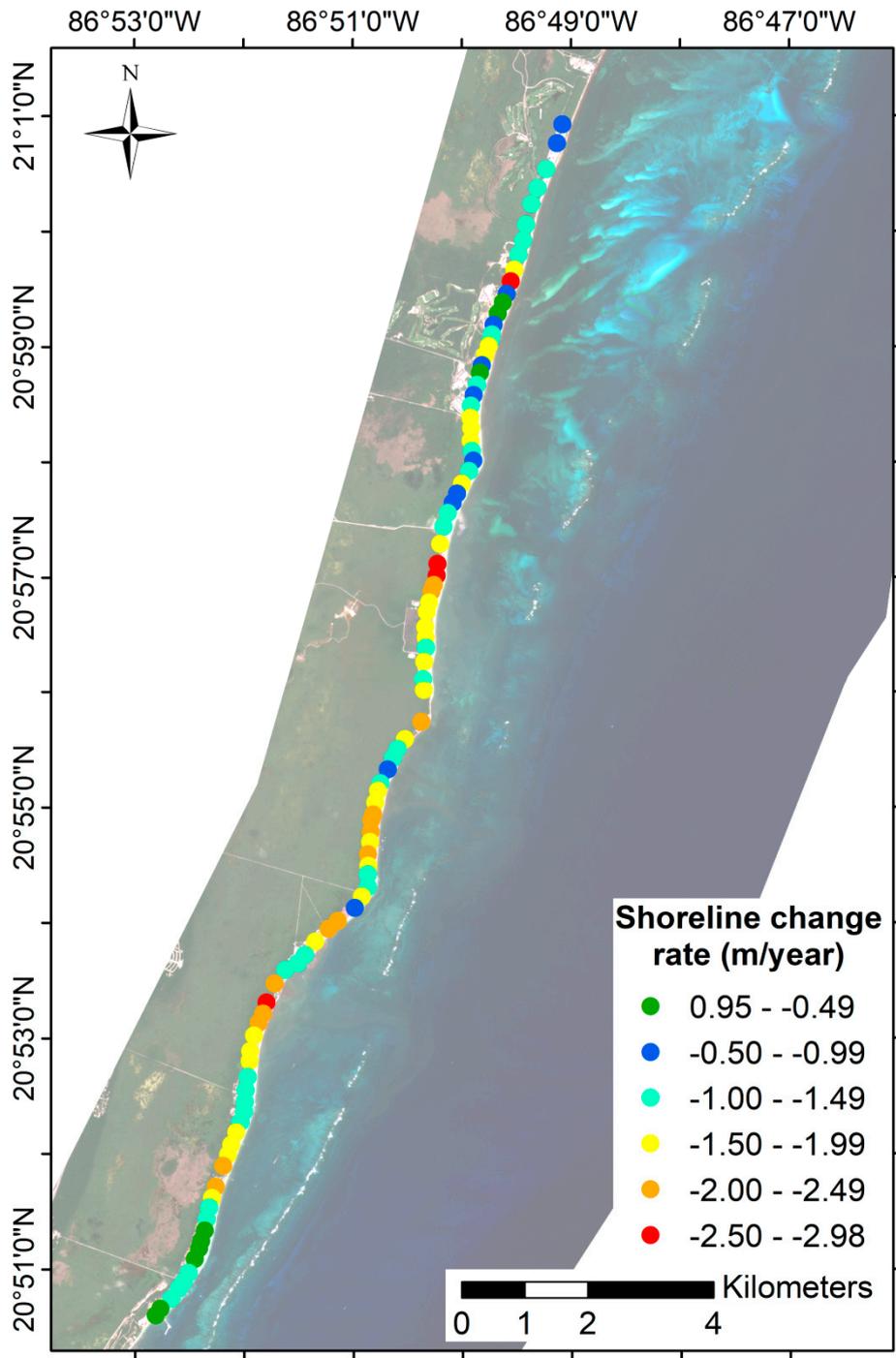
**Figure S3.** Spatial variation of backshore volume (m<sup>3</sup>/m) calculated from beach profile data in PNAPM, winter 2022/2023.



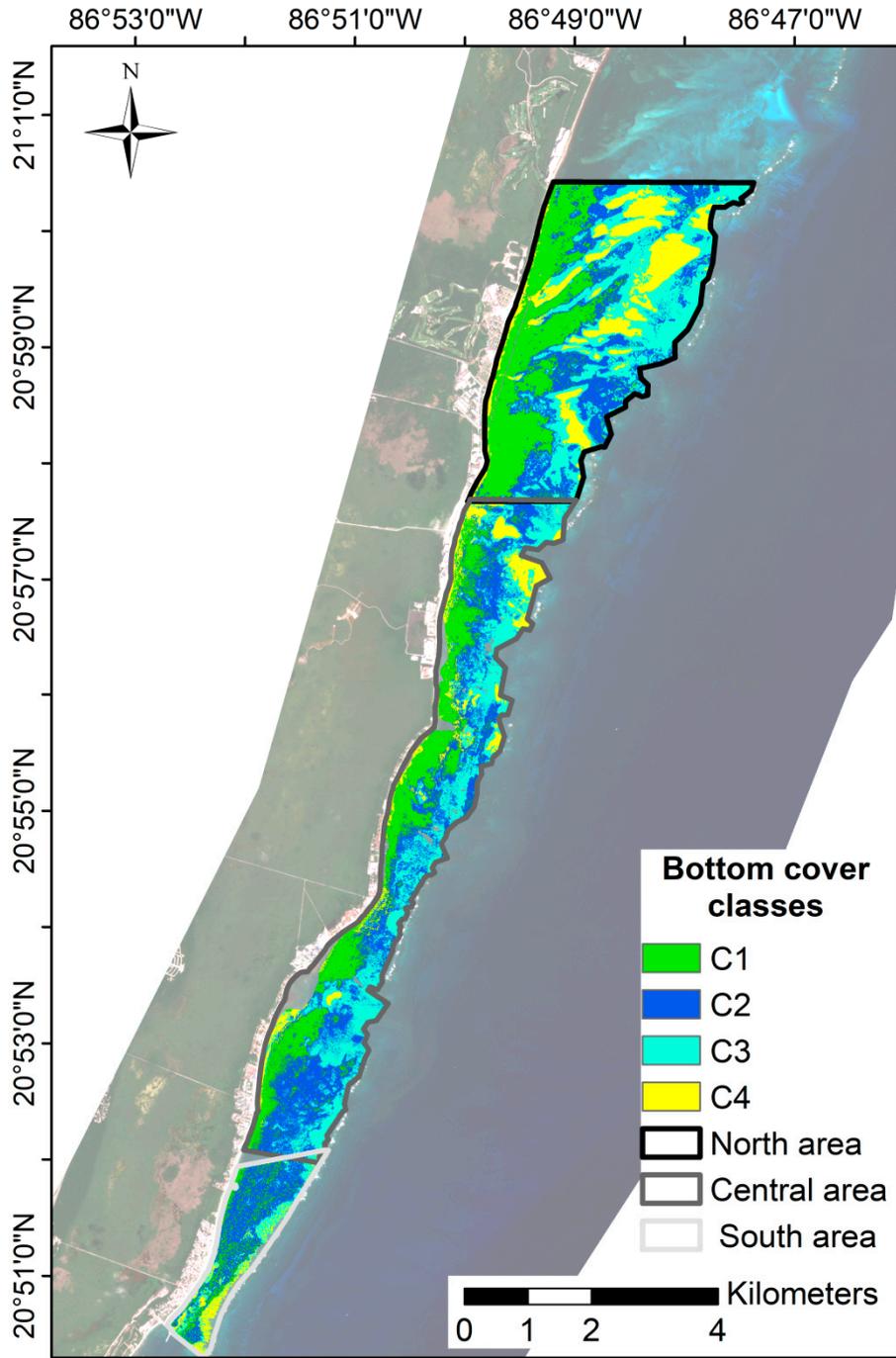
**Figure S4.** Spatial variation of slope of each beach profile zone obtained in PNAPM, winter 2022/2023: dry beach, swash zone and surf zone (Dry beach and surf zone data points are offset for better visualization).



**Figure S5.** Grain size variation (D50) on PNAPM shore, winter 2022/2023, for dry beach, swash and surf zone. Locations with only 1 point refer to swash zone samples.



**Figure S6.** Shoreline change rate (m/year, between 2011-2022) for each location analyzed along the PNAPM shore.



**Figure S7.** Map of bottom cover classes (vegetation/sediment) of the PNAPM reef lagoon, 2020/2021: C1 (dense vegetation), C2 (medium dense vegetation), C3 (Low dense vegetation), C4 (sediment). The bottom cover map of south area is an adaptation of [51].

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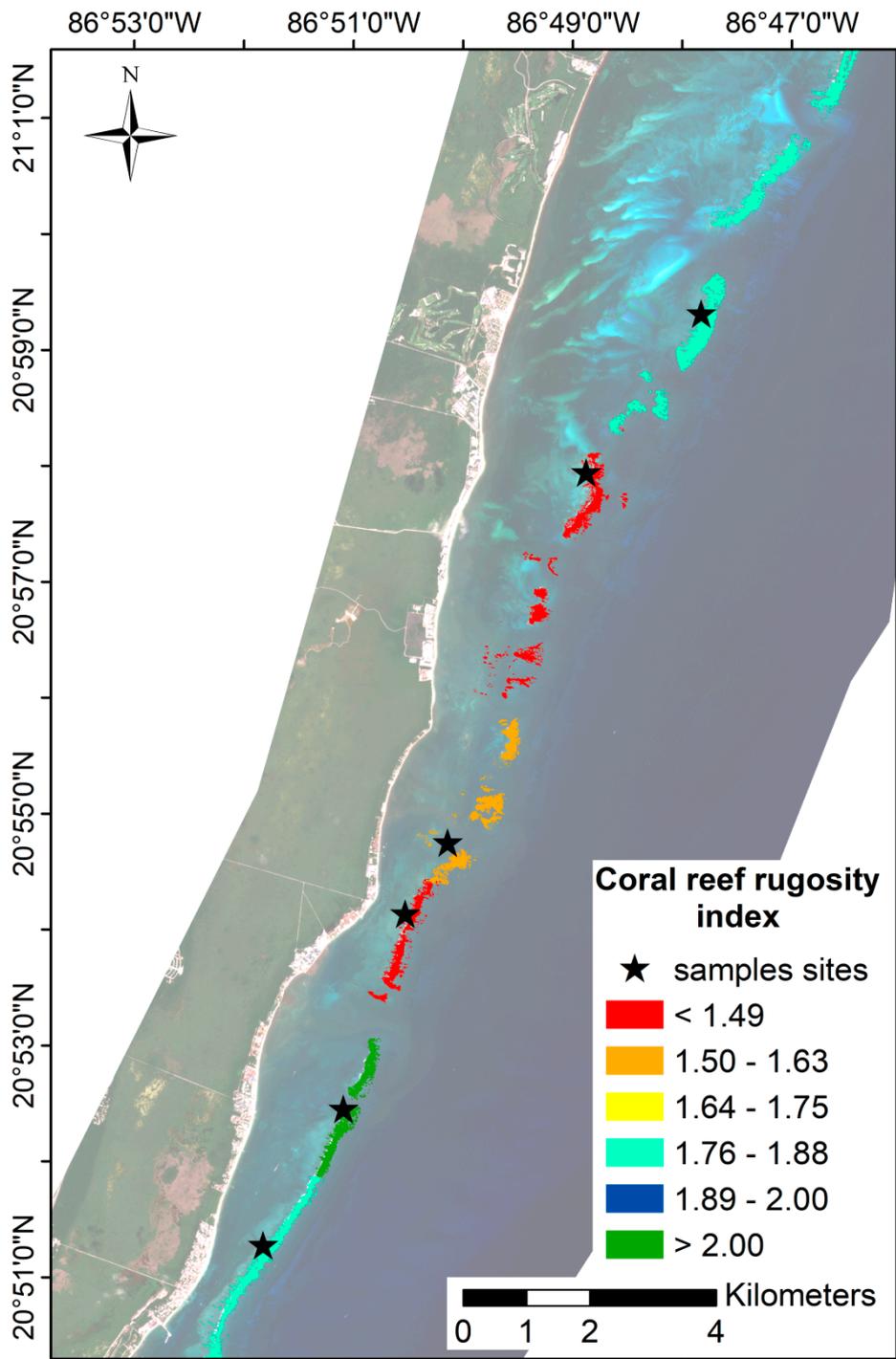


Figure S8. Map of coral reef rugosity index (sites data from [30] and backreef cover from [57]).

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