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WATER QUALITY

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Colored Dissolved Organic Mater (CDOM), Tam Giang Lagoon, Vietnam.

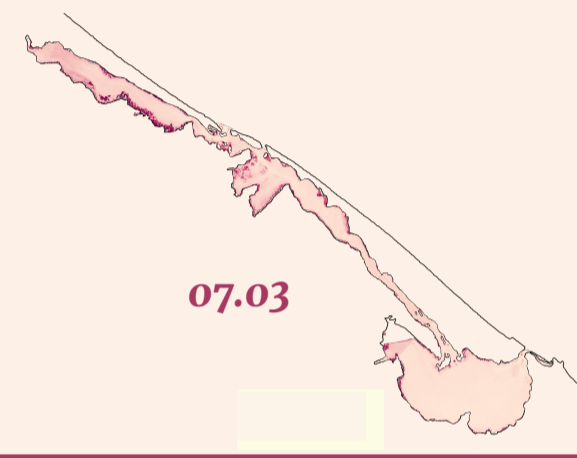
Tam Giang Coastal Lagoon is the largest lagoon in Southeast Asia covering an area of 216 km². It has a mean depth of 2 m and a maximum depth of 5–15 m in the inlets region.

CDOM is the portion of the dissolved natural organic matter in natural waters that absorbs visible light. The sources of CDOM in aquatic ecosystems include two parts: autochthonal (microbial and phytoplankton) and allochthonous sources (terrestrial and anthropogenic inputs).

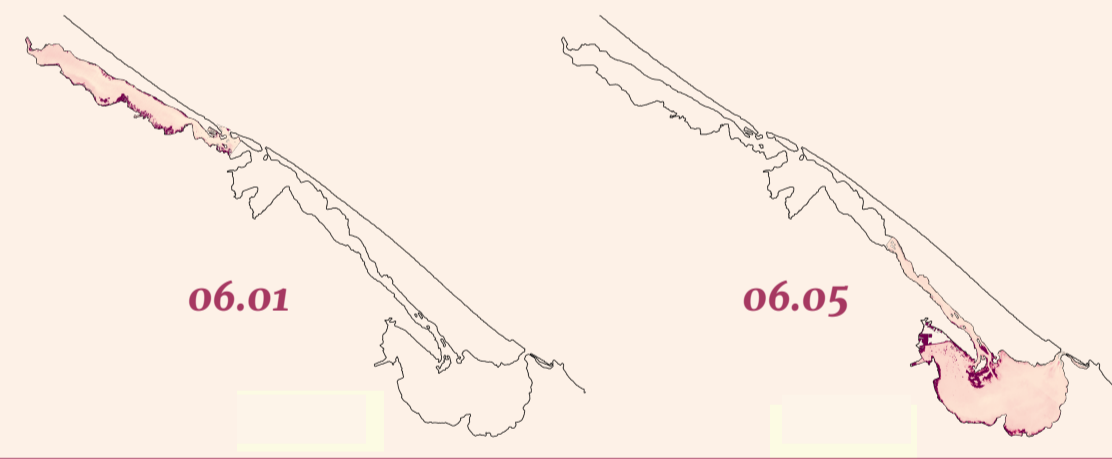
CDOM affects pH and alkalinity, forms chemical complexes with metals (with implications for their bioavailability and toxicity), and acts as a transport agent for metals and nonpolar organic contaminants.

The following map represents the CDOM content gathered with hyperspectral satellite images from 2021 to 2023. The small maps offer a detailed view, while the principal map summarizes the mean maximum and minimum of the CDOM parameter. The CDOM measurements gathered with the WASI model present a high accuracy.

2021



2022



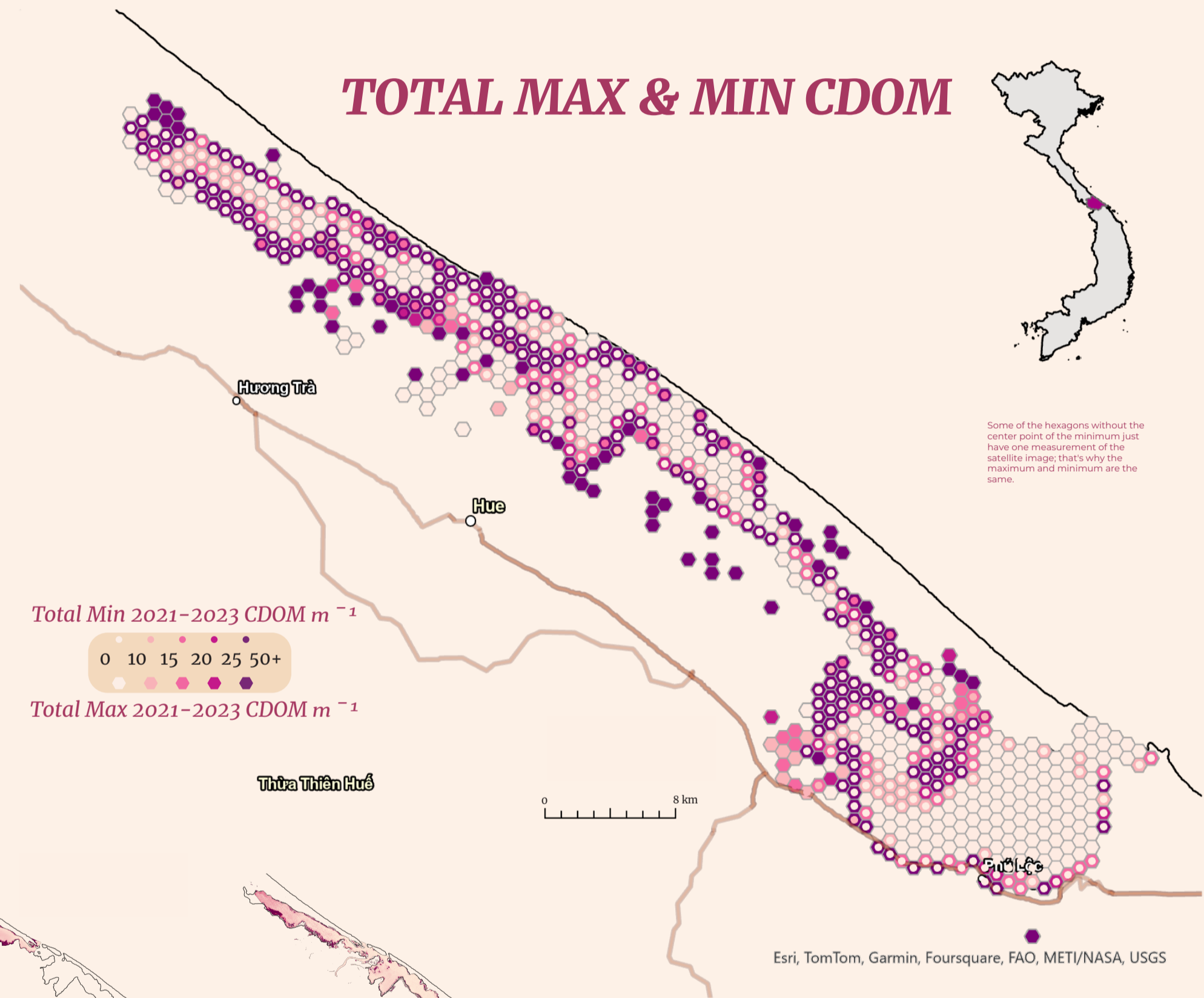
2023



CDOM Satellite m^{-1}
0 50+
MM.DD

0 8 km

TOTAL MAX & MIN CDOM



Total Min 2021-2023 CDOM m^{-1}
0 10 15 20 25 50+
Total Max 2021-2023 CDOM m^{-1}

Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS



Some of the hexagons without the center point of the minimum just have one measurement of the satellite image; that's why the maximum and minimum are the same.

Li, S., Zhang, J., Mu, G., Ju, H., Rui, W., Li, D., & Shabbir, A. (2016). Spatiotemporal Characterization of Chromophoric Dissolved Organic Matter (CDOM) and CDOM - DOC Relationships for Highly Polluted Rivers. *Water*, 8, 399. <https://doi.org/10.3390/w8090399>

Zheng, K., Shao, T., Ning, J., Zhuang, D., Liang, X., & Ding, X. (2023). Water quality, basin characteristics, and discharge greatly affect CDOM in highly turbid rivers in the Yellow River Basin, China. *Journal of Cleaner Production*, 404, 136995. <https://doi.org/10.1016/j.jclepro.2023.136995>

The author of the map: Emma Garcia Boadas, the map is done in collaboration with the University of Salzburg and Palacký University Olomouc, data used: FloodAdaptVN Project, Esri EnMAP images, the map is for educational purposes.

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WATER QUALITY

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Total Suspended Solids (TSS), Tam Giang Lagoon, Vietnam.

Tam Giang Coastal Lagoon is the largest lagoon in Southeast Asia covering an area of 216 km². It has a mean depth of 2 m and a maximum depth of 5–15 m in the inlets region.

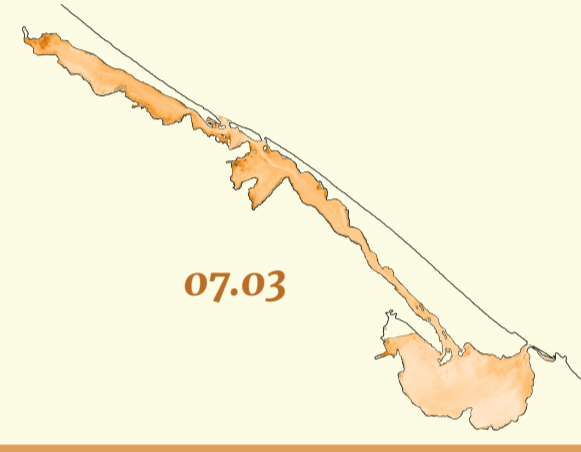
TSS refers to organic and mineral solids suspended in the water column, this can come from surface runoff, catchment areas, rivers ore coast, or be resuspended form the bottom of the water body.

The TSS parameter is closely linked with water transparency /turbidity and Secchi disk depth.

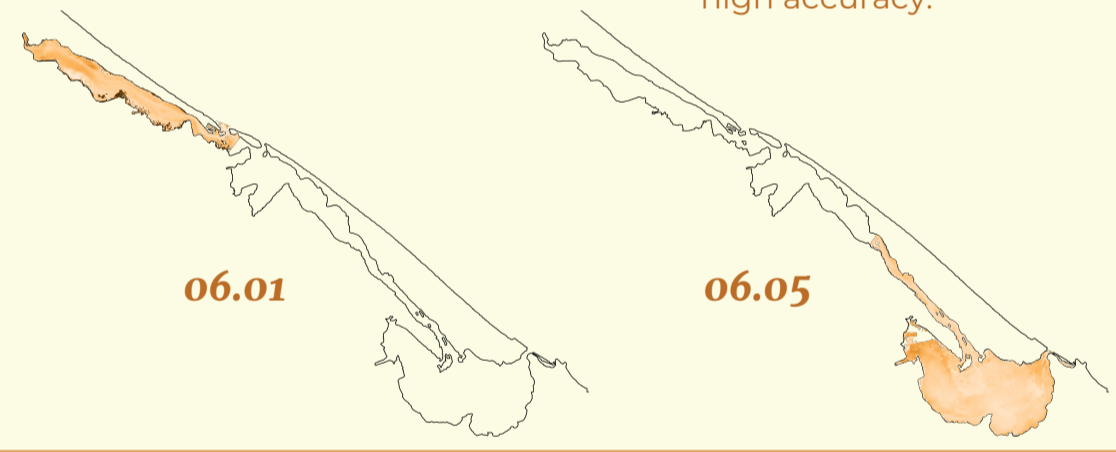
Turbidity events can contain several substances, which is important for water bodies' management. For example, a high turbidity of 20 TSS mg/l in drinking water can harbor microbial pathogens and reduce the efficacy of disinfection. In Vietnam, there is the water quality Circular No. 43/2011/TT-BTNMT regulating the concentration.

The following map represents the TSS content gathered with hyperspectral satellite images from 2021 to 2023. The small maps offer a detailed view, while the principal map summarizes the mean maximum and minimum of the TSS parameter. The CDOM measurements gathered with the WASI model present a high accuracy.

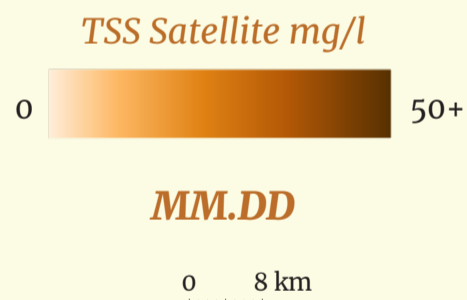
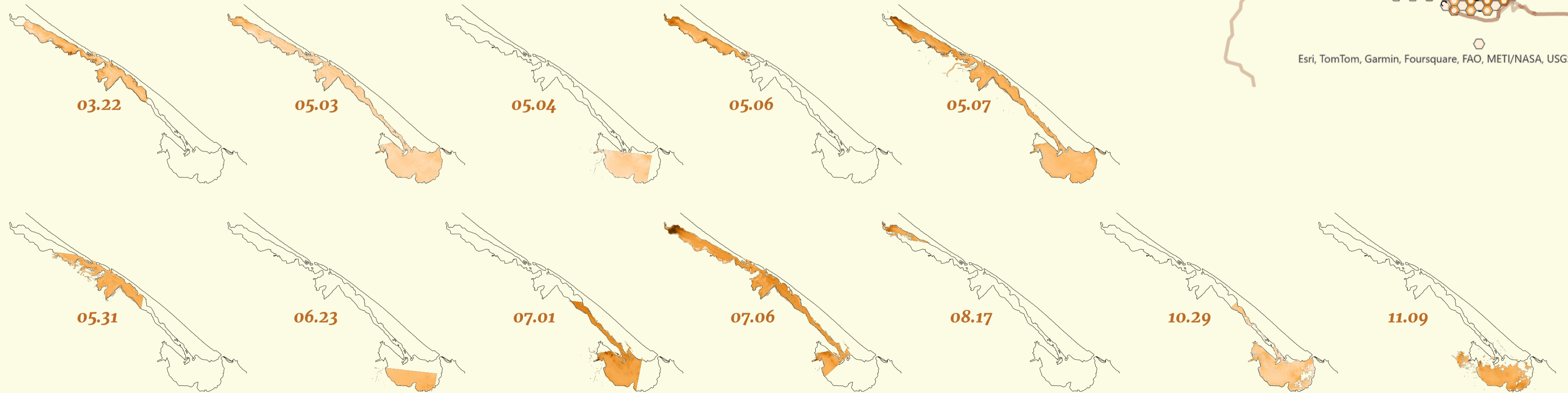
2021



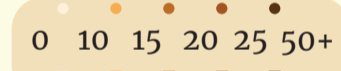
2022



2023

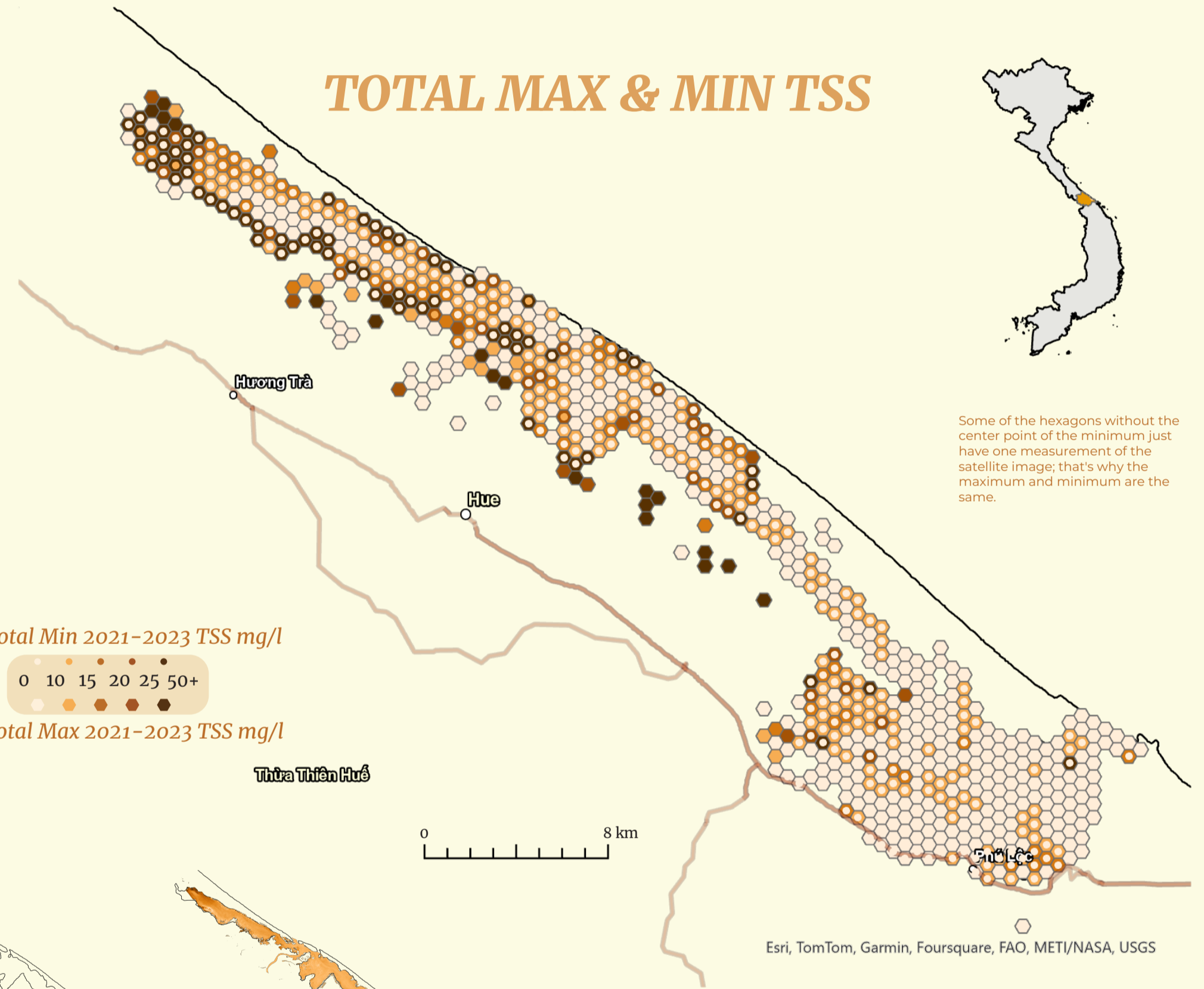


Total Min 2021-2023 TSS mg/l



Total Max 2021-2023 TSS mg/l

TOTAL MAX & MIN TSS



Some of the hexagons without the center point of the minimum just have one measurement of the satellite image; that's why the maximum and minimum are the same.

Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS

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WATER QUALITY

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Green Algae, Tam Giang Lagoon, Vietnam.

Tam Giang Coastal Lagoon is the largest lagoon in Southeast Asia covering an area of 216 km². It has a mean depth of 2 m and a maximum depth of 5–15 m in the inlets region.

Green algae refers to a specific heterogeneous assemblage of algae organisms (Chlorophyta and Streptophyta). These contain chlorophyll-a and chlorophyll-b, which are sensitive to the satellite.

Green algae is closely related to the contribution of nutrients in the lagoon (P and N). If the concentration rises, the algae has more nutrients available to grow. High concentrations of chlorophyll-a (typically at concentrations greater than 0.45 µg/l) can indicate increased nutrient availability supporting the growth of algal blooms.

The following map clearly represents the green algae content gathered with hyperspectral satellite images from 2021 to 2023. The small maps offer a detailed view, while the principal map summarizes the mean maximum and minimum of the green algae parameter, making the data easily accessible and understandable. The green algae measurements gathered with the WASI model present a low accuracy.

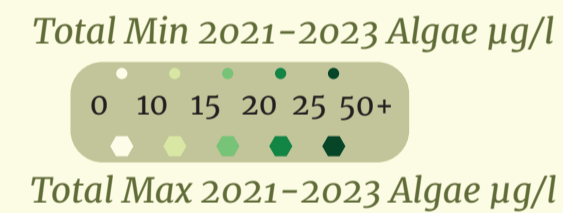
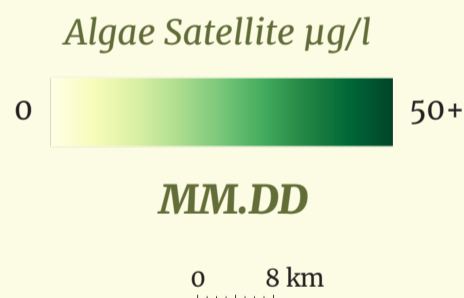
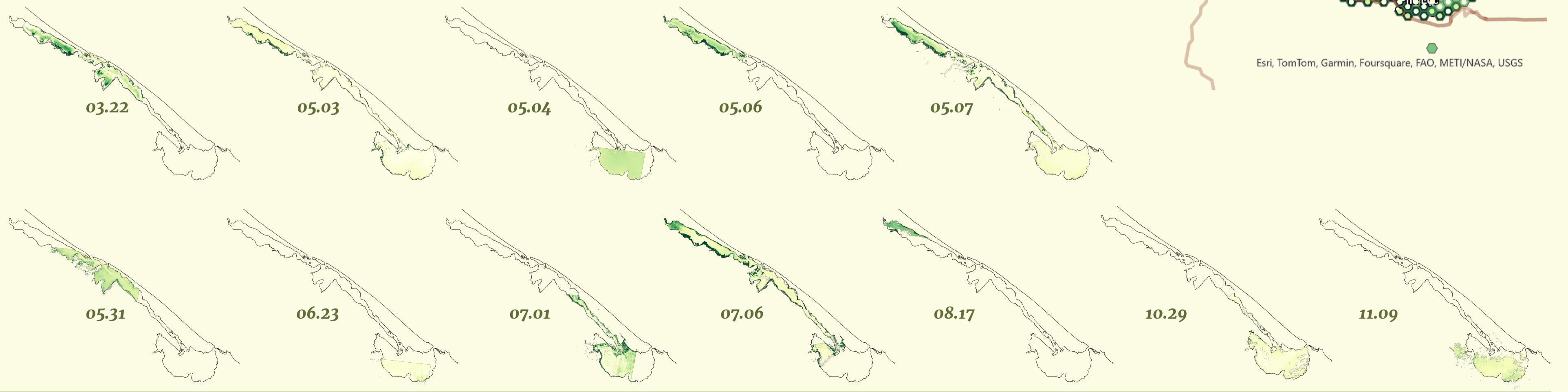
2021



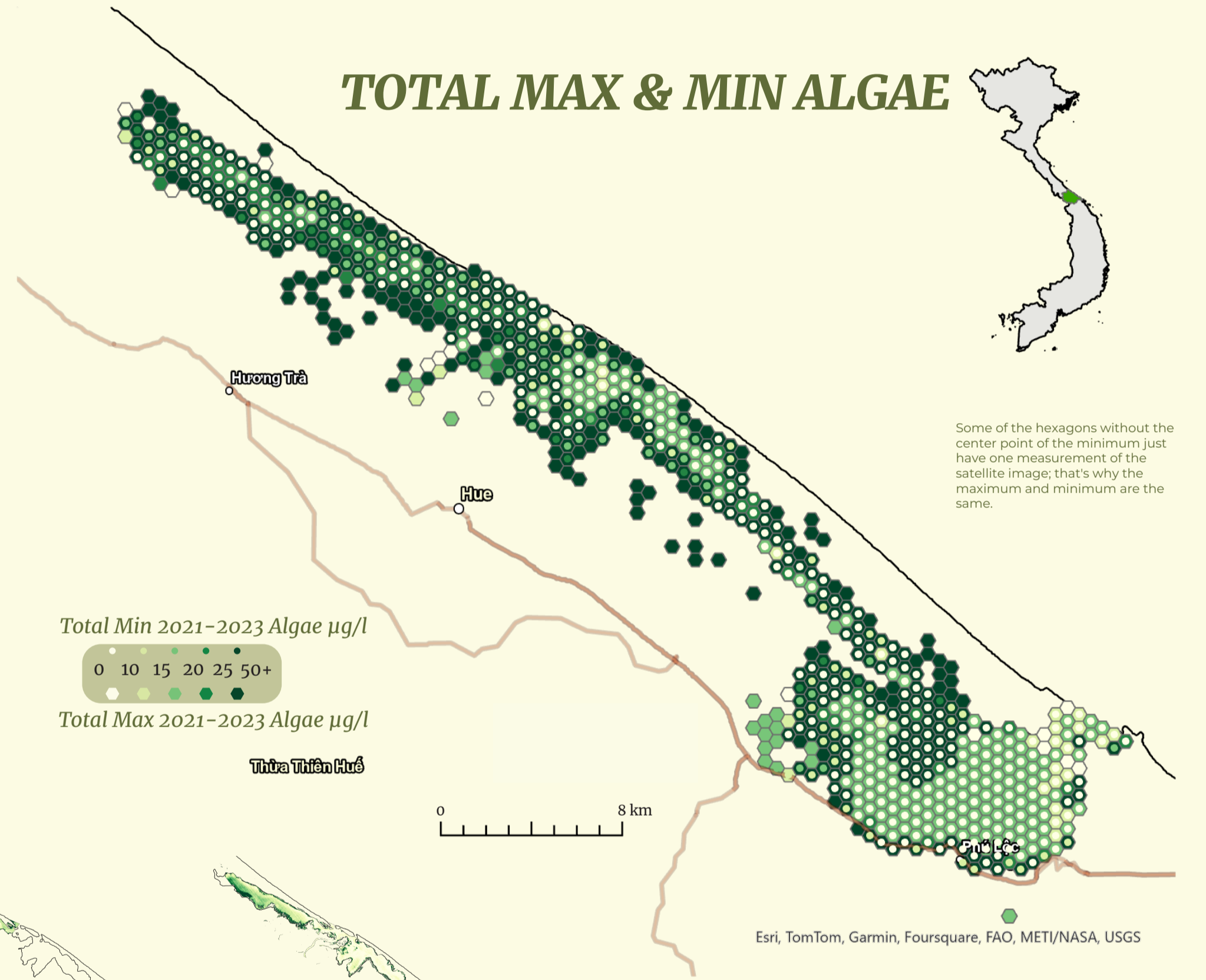
2022



2023



TOTAL MAX & MIN ALGAE



Some of the hexagons without the center point of the minimum just have one measurement of the satellite image; that's why the maximum and minimum are the same.

Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS

Total Suspended Solids (TSS) and Colored Dissolved Organic Mater (CDOM), Tam Giang Lagoon, Vietnam 2021-2023.

Tam Giang Coastal Lagoon is the largest lagoon in Southeast Asia covering an area of 216 km². It has a mean depth of 2 m and a maximum depth of 5-15 m in the inlets region.

TSS refers to organic and mineral solids suspended in the water column. These can come from surface runoff, catchment areas, rivers, or the coast or be resuspended from the bottom of the water body.

The TSS parameter is closely linked with water transparency/turbidity and Secchi disk depth. Turbidity events can contain several substances important for water bodies' management. For example, a high turbidity of 20 TSS mg/l in drinking water can harbor microbial pathogens and reduce the efficacy of disinfection. In Vietnam, the water quality Circular No. 43/2011/TT-BTNMT regulates the concentration.

CDOM is the portion of dissolved organic matter in natural waters that absorbs visible light. The sources of CDOM in aquatic ecosystems include two parts: autochthonal (microbial and phytoplankton) and allochthonous sources (terrestrial and anthropogenic inputs).

CDOM affects pH and alkalinity, forms chemical complexes with metals (with implications for their bioavailability and toxicity), and acts as a transport agent for metals and nonpolar organic contaminants.

The following map represents the TSS and CDOM content gathered with hyperspectral satellite images from 2021 to 2023. The small maps offer a detailed view of the two contents simultaneously, while the bar charts indicate the distribution of values of the satellite images in hexagons. The TSS and CDOM measurements gathered with the WASI model present a high accuracy.

