



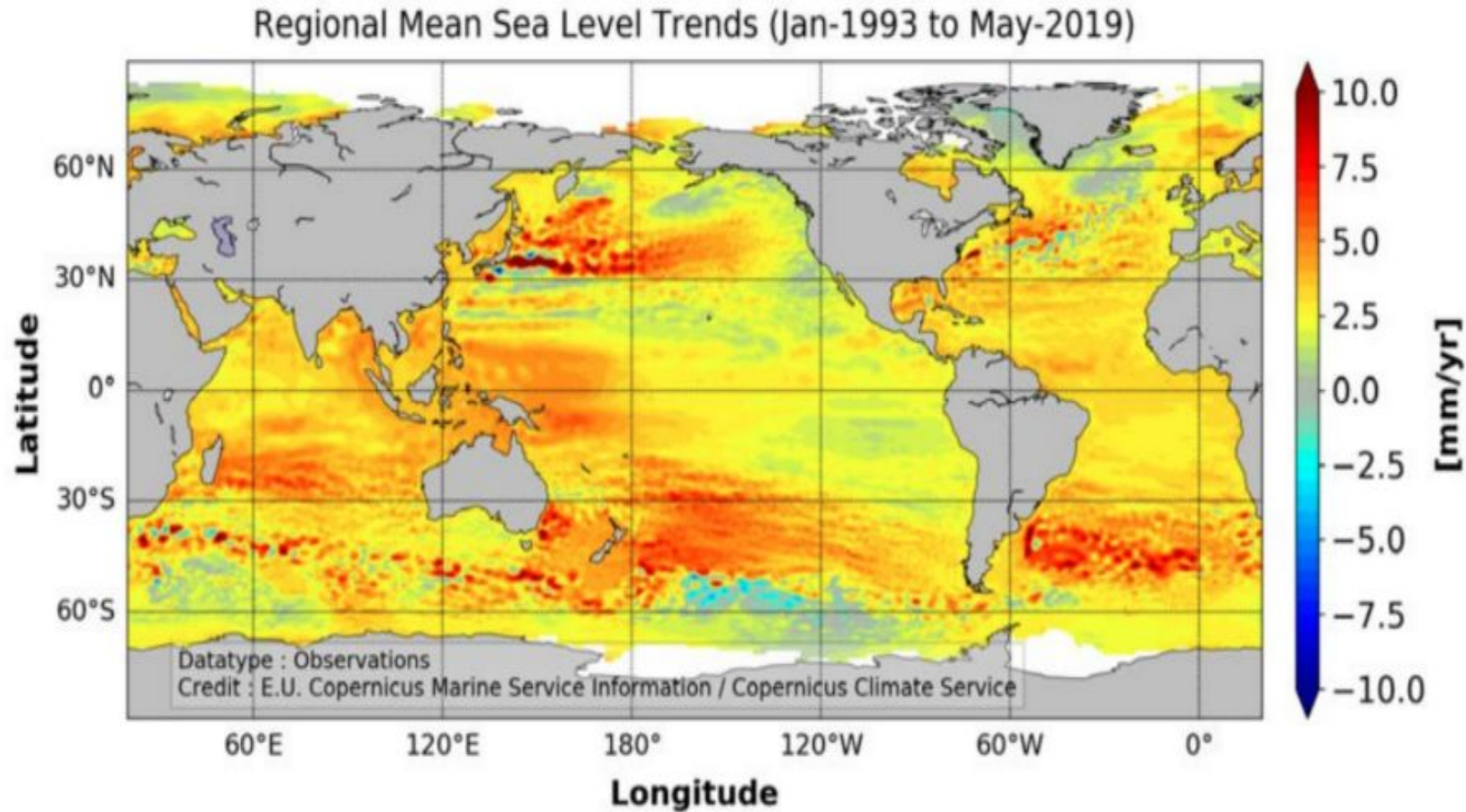
Earth Observations in support of Coastal Adaptation Action

Emily Smail, Ph.D.,
Executive Director, GEO Blue Planet Initiative
Satellite Oceanography and Climatology Division
National Environmental Satellite, Data Information Service
National Oceanic and Atmospheric Administration (NOAA)

@geoblueplanet
www.geoblueplanet.org
info@geoblueplanet.org

Earth Observations in Support of Coastal Adaptation and NAPs

- Earth Observations can support the sustainability of coasts by:
- Providing data on rates of Sea Level Rise
- Assessing intensity of coastal storms
- Tracking the trajectory of tsunamis
- Assessing signs and rates of coastal erosion
- Assisting coastal communities in making informed decisions.



GEO Blue Planet Activities in Support of NAPs in The Philippines



NAP Issue	GEO BLUE PLANET Theme	Ocean Observation information
Food Security	Sustainable Fisheries and Aquaculture	Identify presence of toxic algae; track illegal fishing activity; monitor environments that support fisheries stock species; monitor environmental pressures on culture such as SST, pollution and habitat degradation
Water Sufficiency	Marine Pollution	Ground-based (in situ) observations and satellite observations can be used together to monitor and forecast water quality (e.g. sewage discharge, oil spills, industrial waste, agricultural runoff, storm water runoff, and sediment runoff)

NAPs will only be sustainable at the local level:

(1) robust community ownership for climate action which means data at resolutions relevant to community-scale

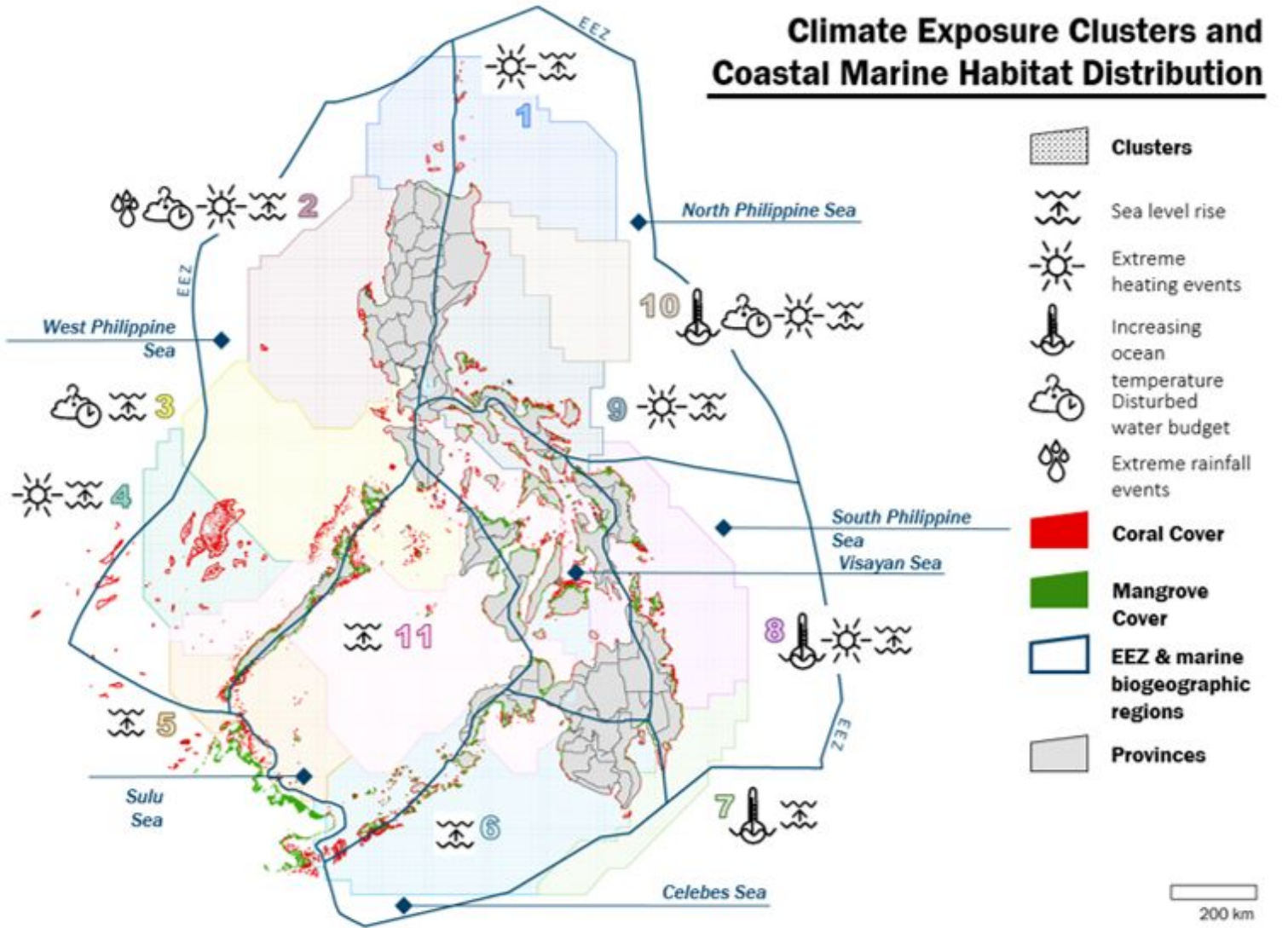


LTDavid et al.,



Parameter	Method of Calculation
Trends	
Temperature	slope (from AVHRR: http://apdro.soest.hawaii.edu)
SSH	slope (from Topex Poseidon/JASON: http://www.aviso.oceanobs.com/)
Anomalies	
Temperature	intensity of positive anomaly ² (from AVHRR)
Precipitation	intensity and frequency of positive anomaly ² (from TRMM http://trmm.gsfc.nasa.gov)
Model Scenarios	
Precipitation	changed from current normal based on PAGASA scenarios for 2050 – the HadCM3Q0 AIB and the ECHAM4 A2

Climate Hazard Clusters and Coastal Marine Habitat Distribution



NAPs will only be sustainable at the local level:

(2) leverage opportunities based on their own comparative advantages (e.g. nature-based solutions)

- Areas with significant coastal resources fared better e.g., coastal communities with thick mangrove forests.
- In Palompon, a mangrove plantation, located on an island a few hundred meters from the shoreline buffered the full impact of the **3.6 meter storm surge**.



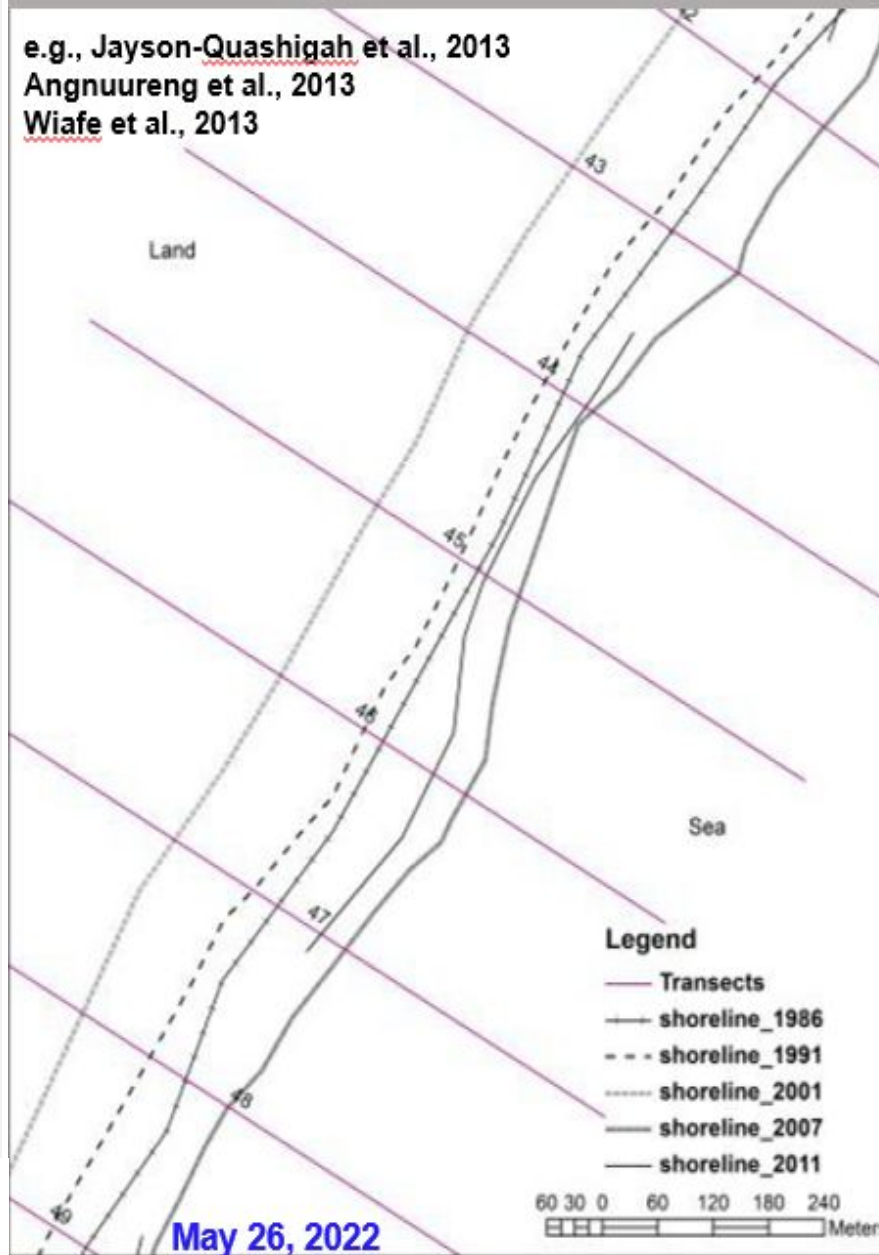
Coastal Erosion in Ghana

- Coastal erosion and flooding are phenomena that occur naturally in Ghana
- Human activities and infrastructures have a strong influence on these phenomena
- There is shortage of sediment caused by:
 - ✓ erosion
 - ✓ sand mining
 - ✓ Fine sand: 50 % of suspended sediment in Ghana are of grain sizes less than 63 μm (Ayibotele & Tuffour-Darko, 1979)
 - ✓ dam construction
 - ✓ construction of large port complexes destabilized this sedimentary drift, etc.,



Beach changes are mostly assessed from satellites

e.g., Jayson-Quashigah et al., 2013
 Angnuureng et al., 2013
 Wiafe et al., 2013

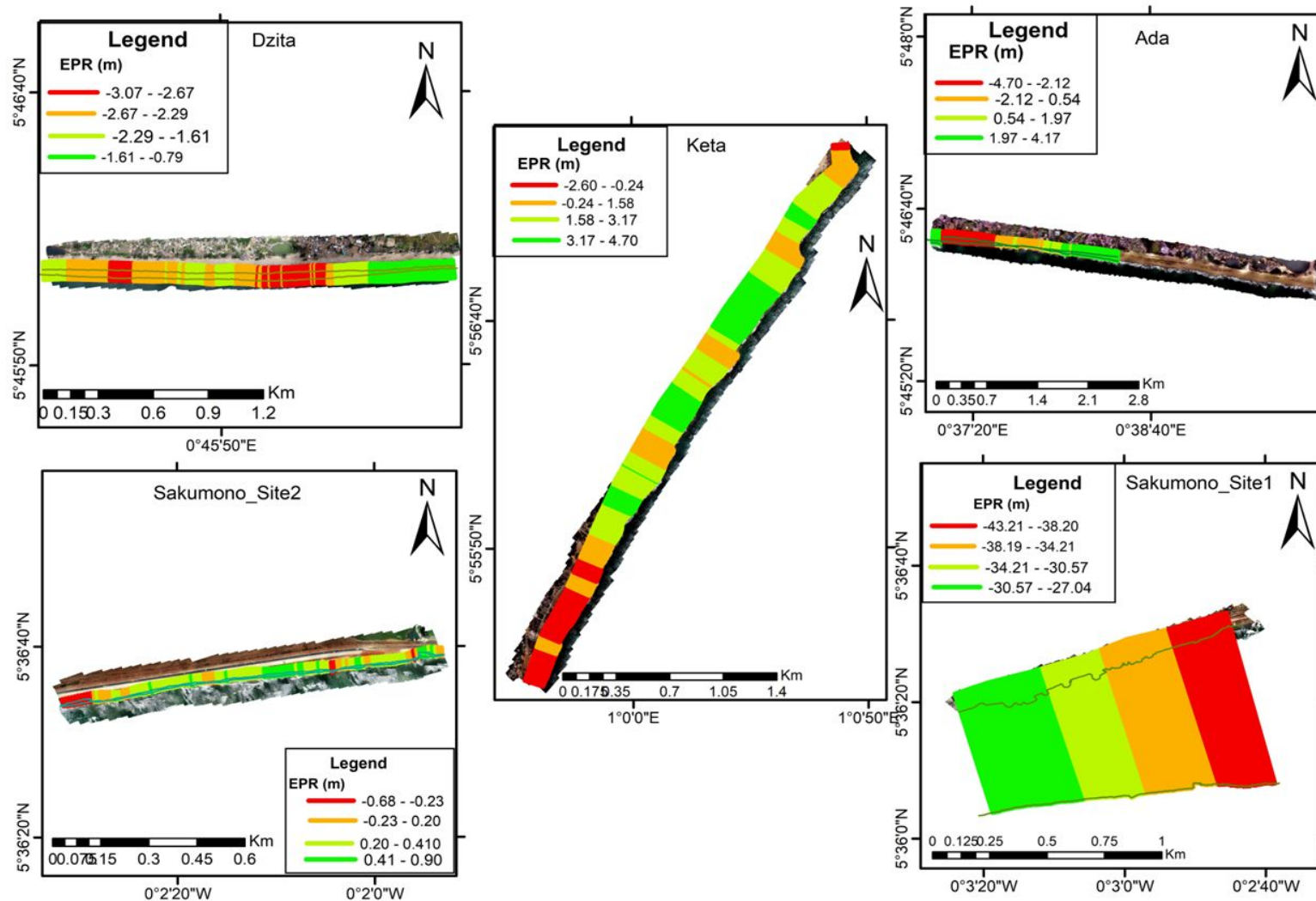


Beach Changes on the Eastern Coast of Ghana

Shoreline changes between 2005 and 2021 for selected sites in the east

- Ghana's coast can be placed in 3 geographical sections: east, central and west.
- Selected sites are Keta, Dzita, Ada and Sakumono

- Erosion rates in the East vary between 2 and 17 m per year on average depending the spatial scale



Additional GEO Blue Planet Activities in Support of NAPs

GEO Blue Planet Coastline Changes Working Group

Objectives:

- Work with stakeholders at local and regional scales to identify data information gaps.
- Provide networking and coordination support to connect the marine hazard community
- Identify best practices related to monitoring and management to inform policy recommendations and to measure the impact of mitigation strategies.
- Provide support for technology transfer, training and information exchange on coastal hazards monitoring and management.

Additional GEO Blue Planet Activities in Support of NAPs

GEO Blue Planet Climate Adaptation Working Group

Objectives:

- Work with stakeholders at global, regional and local scales to identify data and information gaps.
- Provide networking and coordination support to connect climate adaptation and blue carbon mapping community.
- **Identify best practices and guidance documents for developing National Adaption Plans related to Ocean and Coastal Observations to inform policy recommendations.**
- Support the development and technology transfer of Earth Observations-based blue carbon mapping products.

Thank You!



Emily Smail
GEO Blue Planet
NOAA/NESDIS/STAR
Emily.Smail@noaa.gov
esmail@geoblueplanet.org

Collaborate and communicate with GEO

