WIND AND WAVE ENERGY

(Sainte Marie – MADAGASCAR)

Rhino RAJAONARIVONY

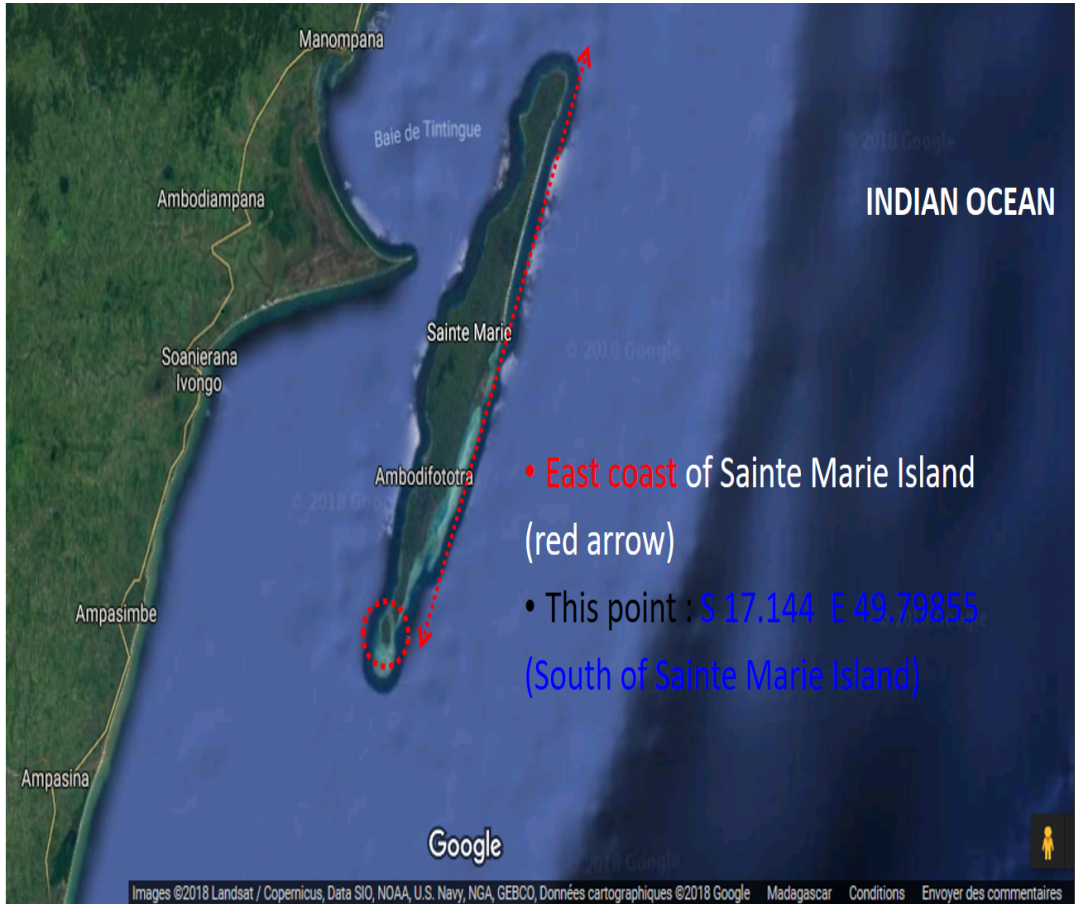
DIRECTION GENERALE DE LA METEOROLOGIE

11th and 12th February 2020, Antananarivo, Madagascar

OBJECTIVE

We make use wind and wave databases provide by The C-RISe project, to evaluate the monthly variability of wind and wave power around Sainte Marie island.

WHY ANALYSIS IS USEFUL?



In the East coast of Madagascar, Sainte Marie is one of the most beautiful island in the Indian Ocean.

This island is located in an area subject to the Alize regime, has a wind and wave potential energy deserving to be valued.

Then, the Evaluation of Wind and Wave Energy Resources around this island is an imperative necessity.

WHY ANALYSIS IS USEFUL?

Ile aux Nattes, a small island, one of **the most populated locality but no electricity** at Sainte Marie island.

DATA

- Problem: Absence/Rarity of measurements in situ

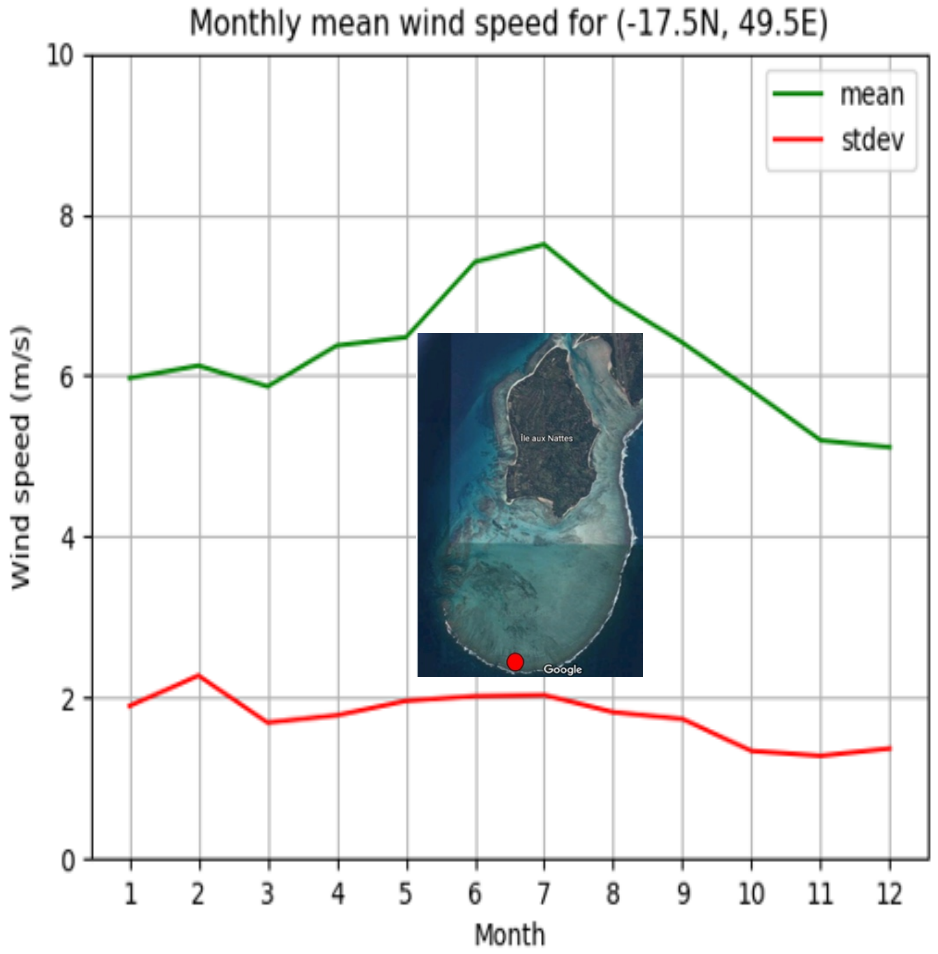
- Essential > SATELLITE DATA

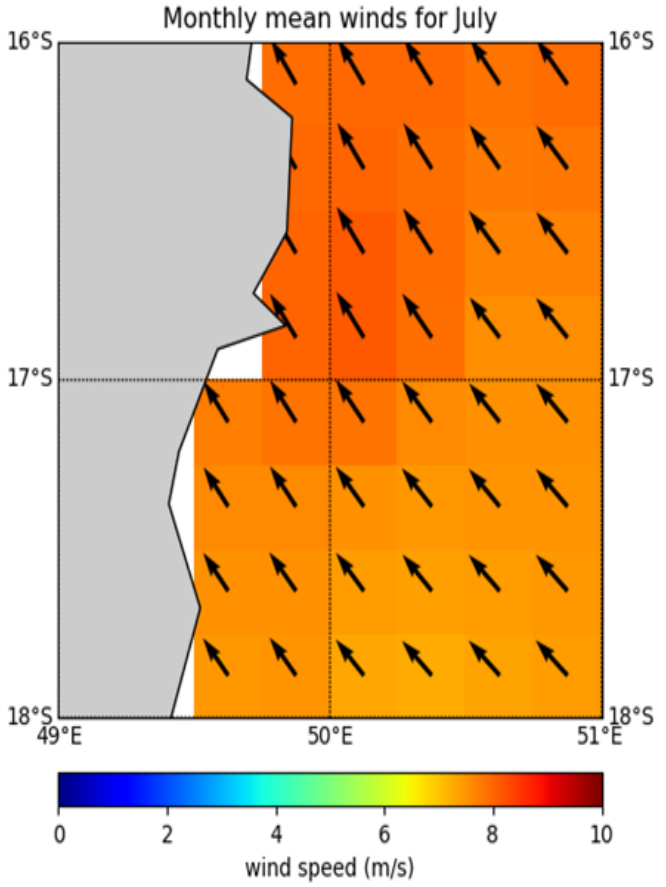
DATA

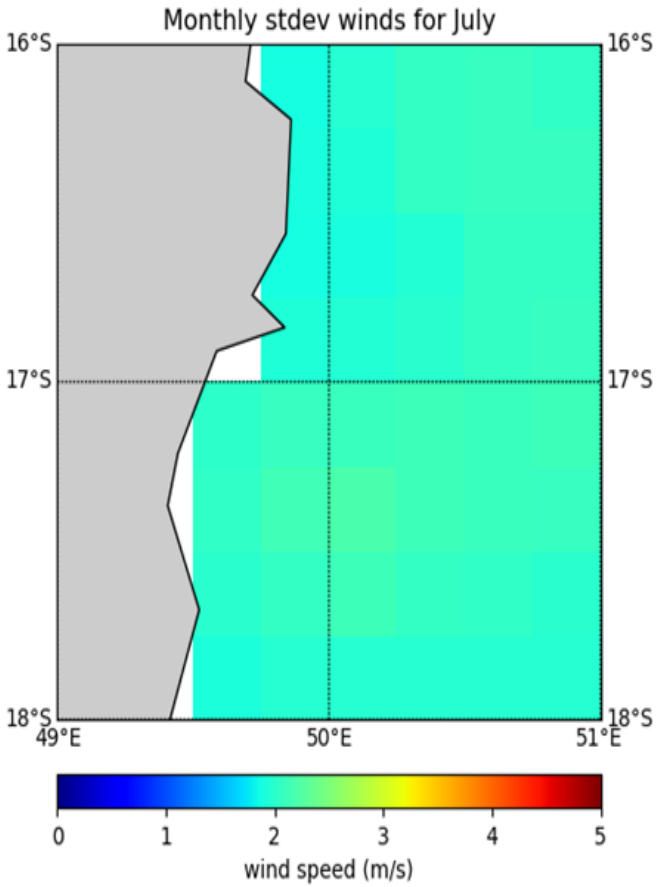
The case study use C-RISE data:

- Winds data, period: May 2007 to Jan 2017
- Waves data, period: Jan 1991 to Dec 2013
- SAR : Jan 2002 to Dec 2012

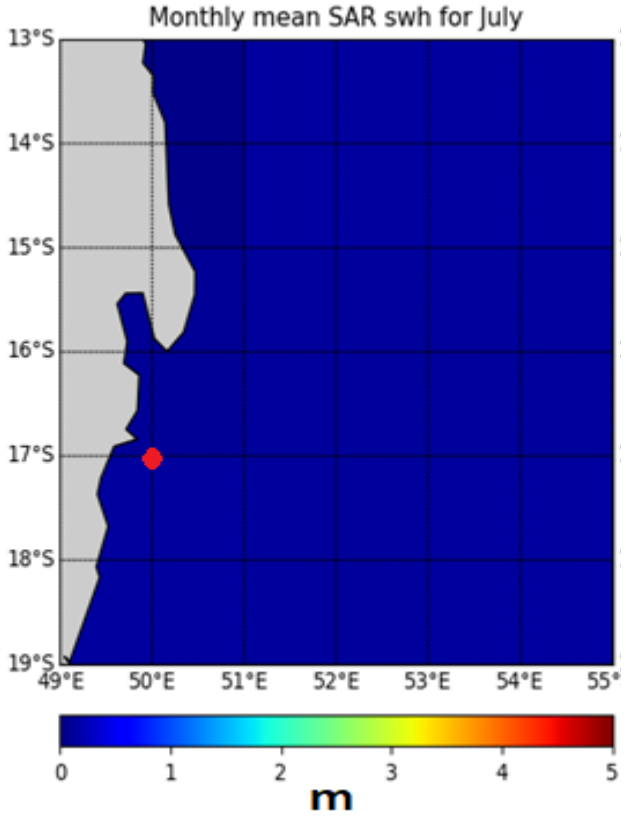
Results - Monthly Variability of winds

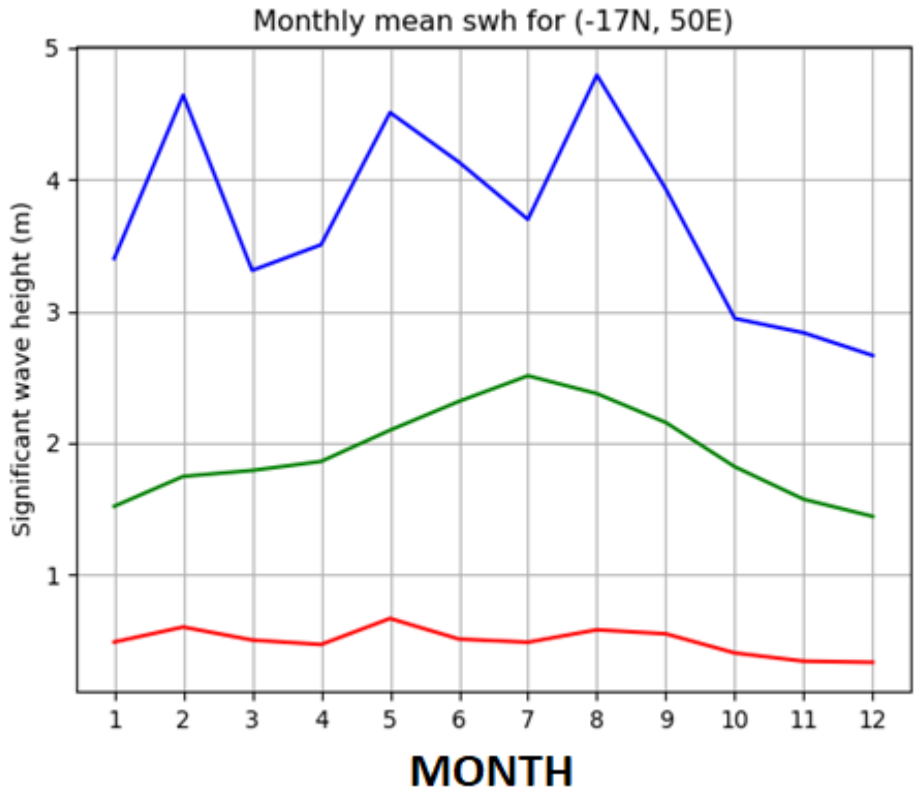






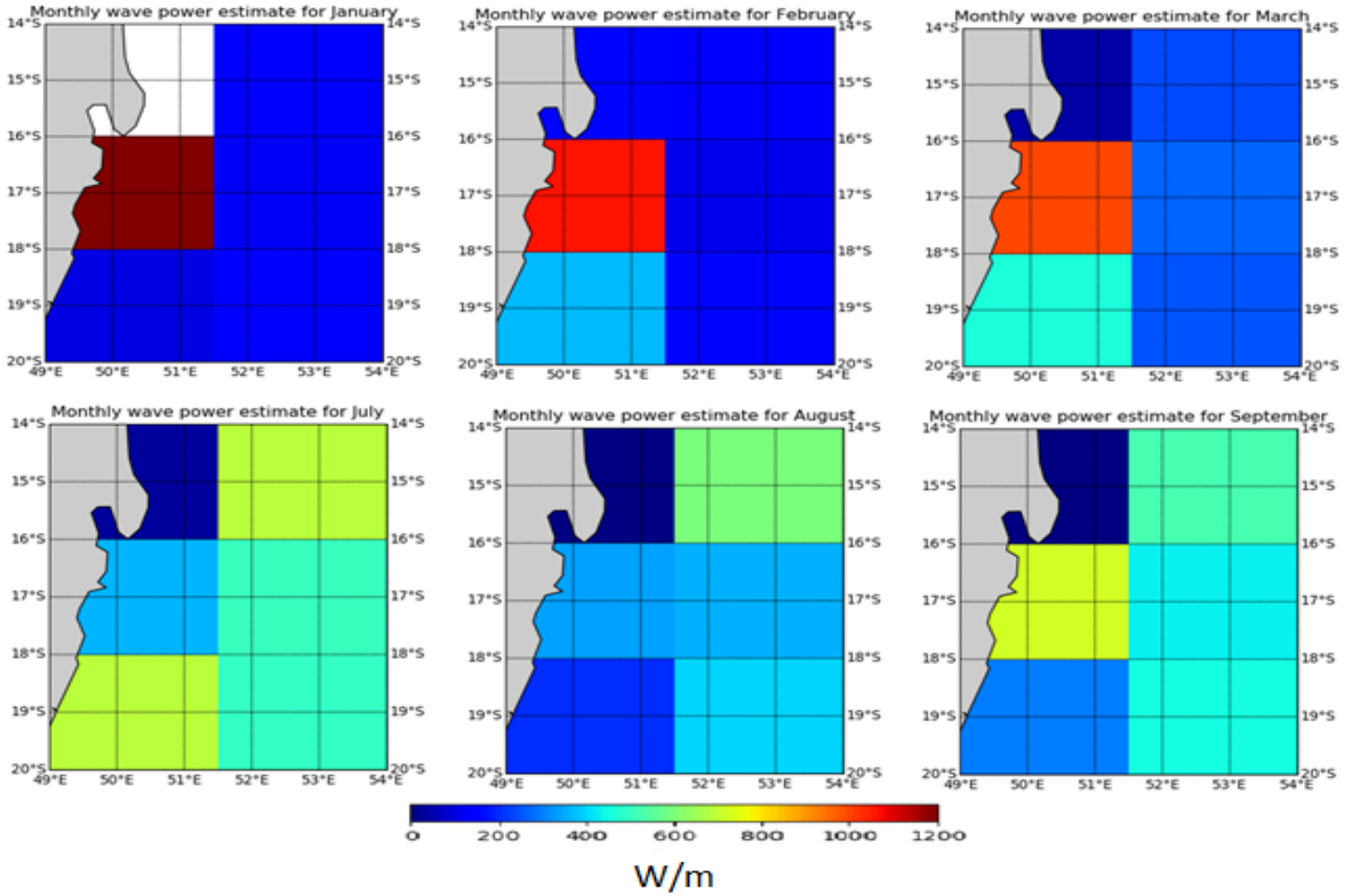
Results - Monthly Variability of Significant Wave Height (SWH)





This graph Represent the **Monthly mean** significant wave height for this point : -17N, 50E (green line). Also shown are the **standard deviation** (red line) and **maximum sampled wave height** (blue line). The high values at this point are suspicious and the data here should be checked in further work.

Results - Monthly wave power estimate



CONCLUSIONS & RECOMMENDATIONS

- The wind and waves looks good
- The general trend of higher values offshore for June to September looks good
- The SAR data show a low spatial resolution for this use case

THEN WE NEED:

- Data : more high temporal and spatial resolution
- This Use case shall be repeated (East Coast)
- More training
- Buoys installations

C-RISe
COASTAL RISK
INFORMATION SERVICE

THANK YOU

SATOC Satellite Oceanographic Consultants
WWF
Universidade Eduardo Mondlane
INAM
INAHINA República de Moçambique
IHSM Université de Toliara
Bilko
METEO Madagascar
Conservation International
CNRO
CSTR
National Oceanography Centre Natural Environment Research Council