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"MARLOG 13"

Towards Smart Green Blue Infrastructure

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Medicanes and its metrological effects in the Mediterranean Sea

Case study of Medicane Ianos

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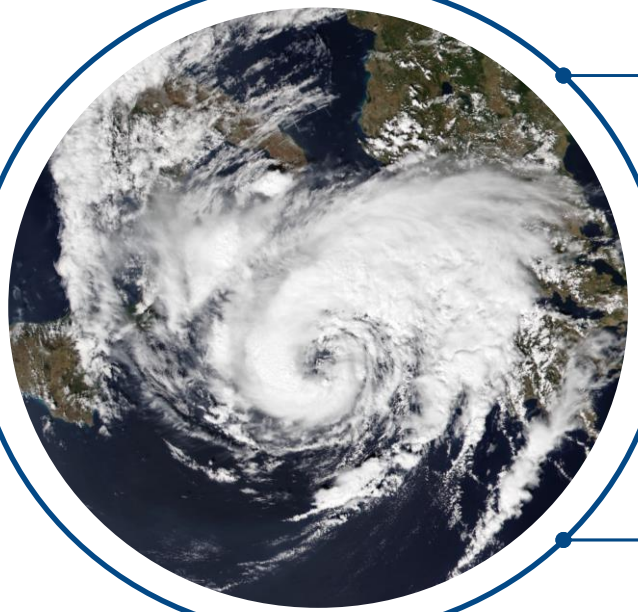
1 Introduction

Climate Change

- Extreme Events Assessment
- Flood Risk Management
- Sustainable Infrastructure

1 Introduction

Coastal Flooding

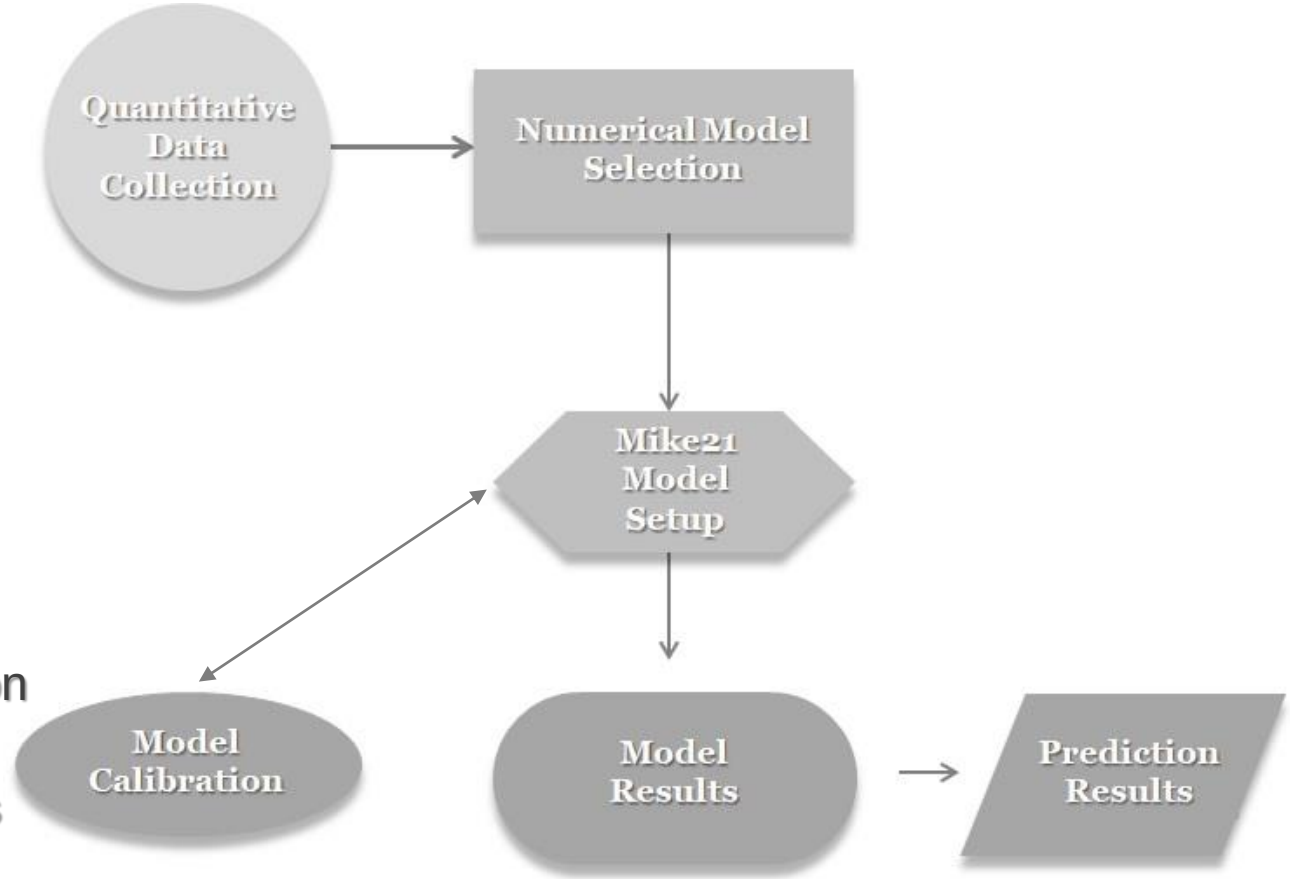


Coastal Flood Mana.

- Hurricanes and Medicanes
- Increased frequency of tropical cyclones
- Aim to study Medicanes & metrological effects through Medicane Ianos as a case study

2 Materials and Methods

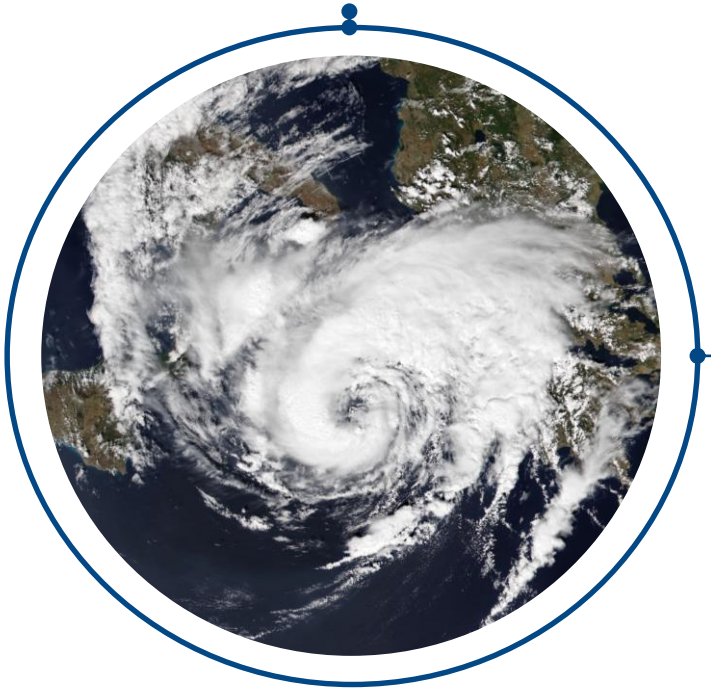
Meteorological Conditions

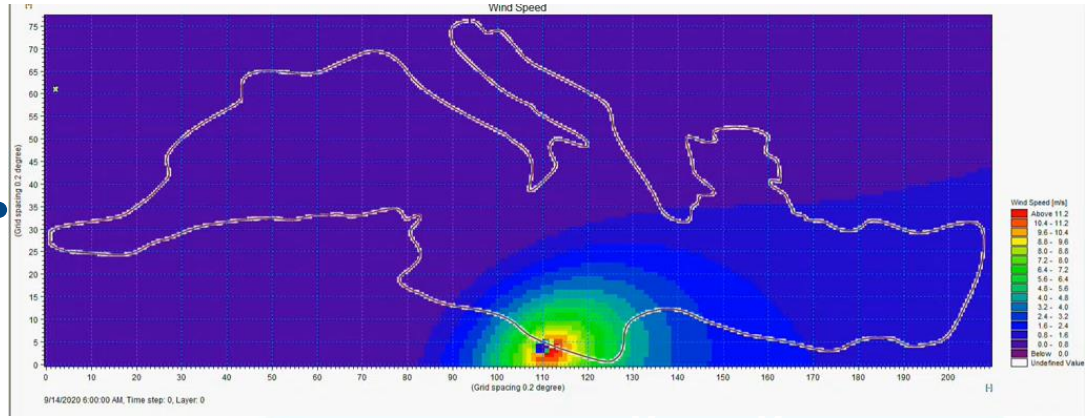


several calibration trials for model main parameters

2.1 Quantitative Met-Ocean Data Collection

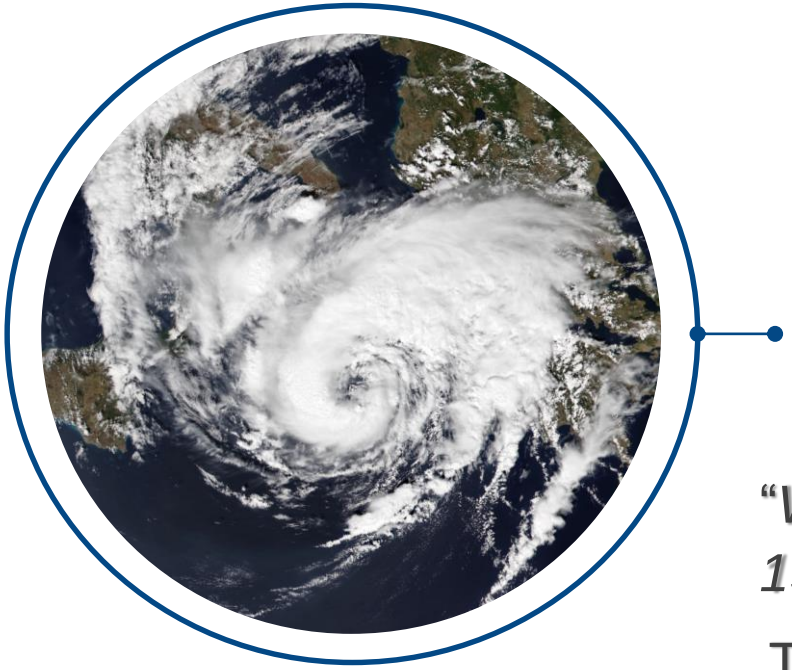
Advanced Scatterometer (ASCAT)

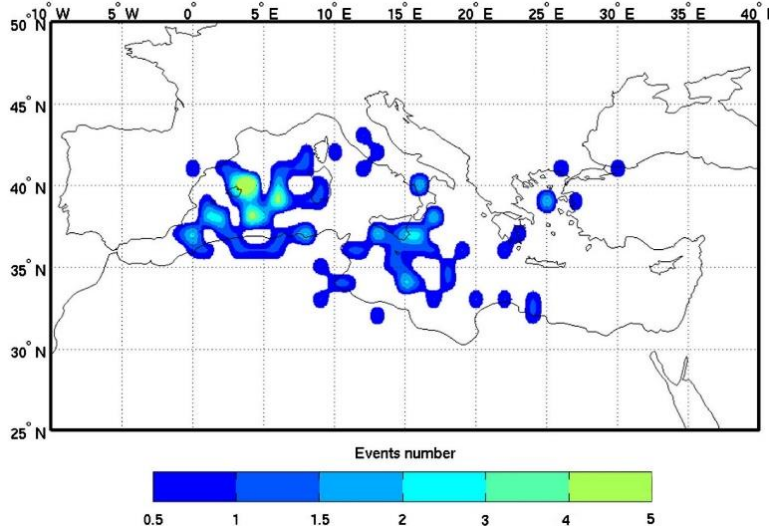




"September 2020, Medicane Ianos resulted in flooding and severe damage at several coastal locations"

2.1 Quantitative Met-Ocean Data Collection

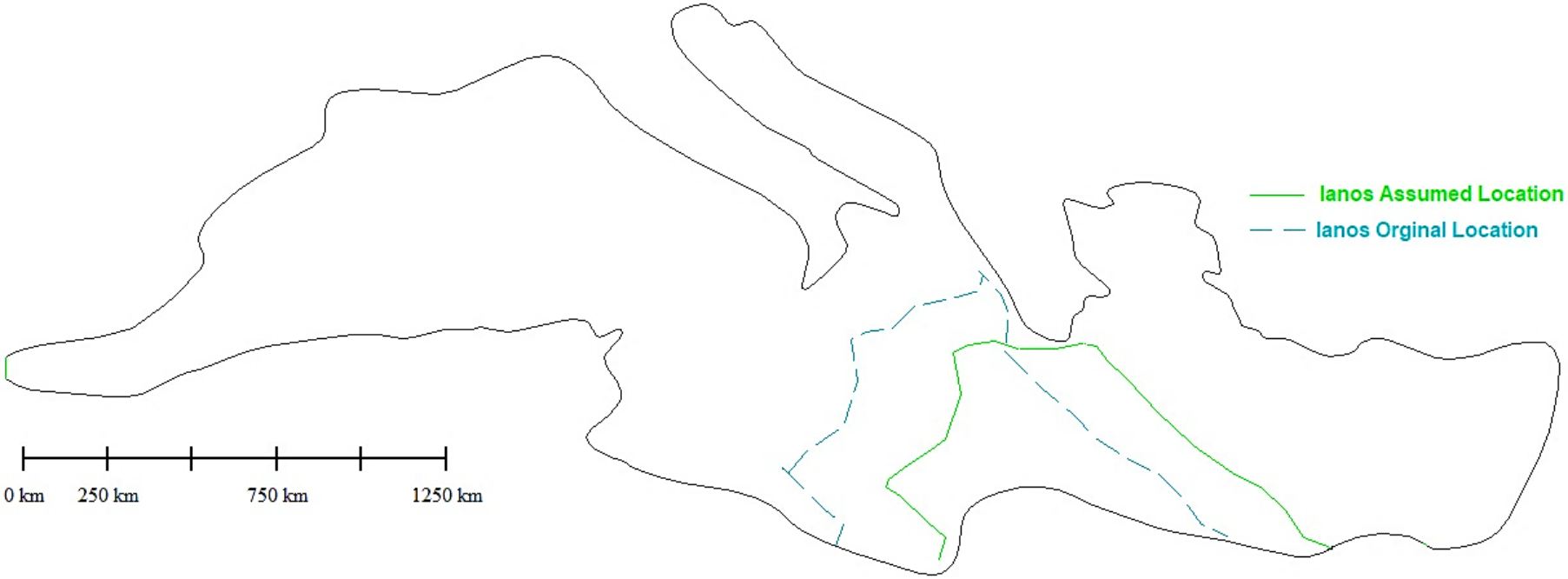




"*Wind Medicane generated events from 1948 to 2011*"

There is a 1 % chance that a 100-year flood will occur over the next year.

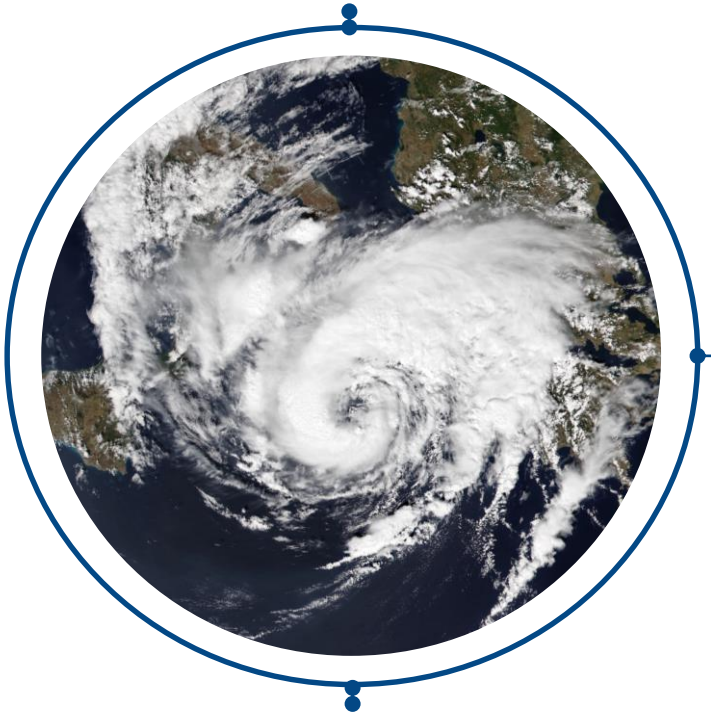
2.1 Quantitative Met-Ocean Data Collection

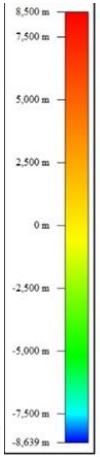


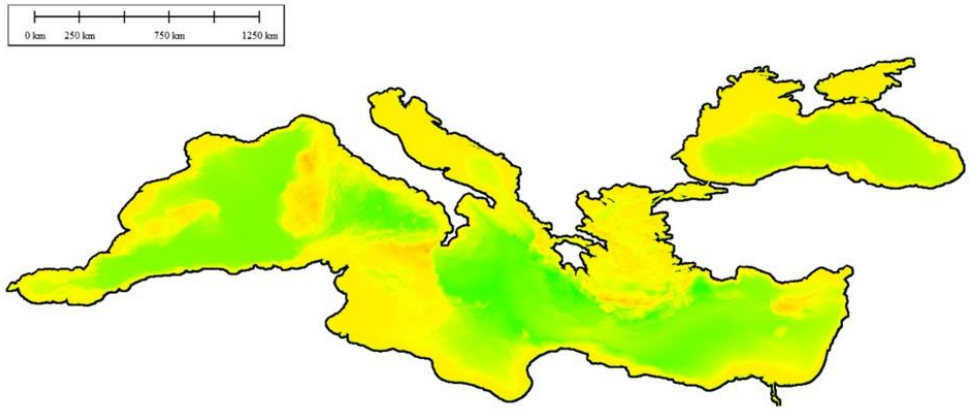
Additional assumed path for the Medicane Ianos (Category 2 Medicane) has been simulated

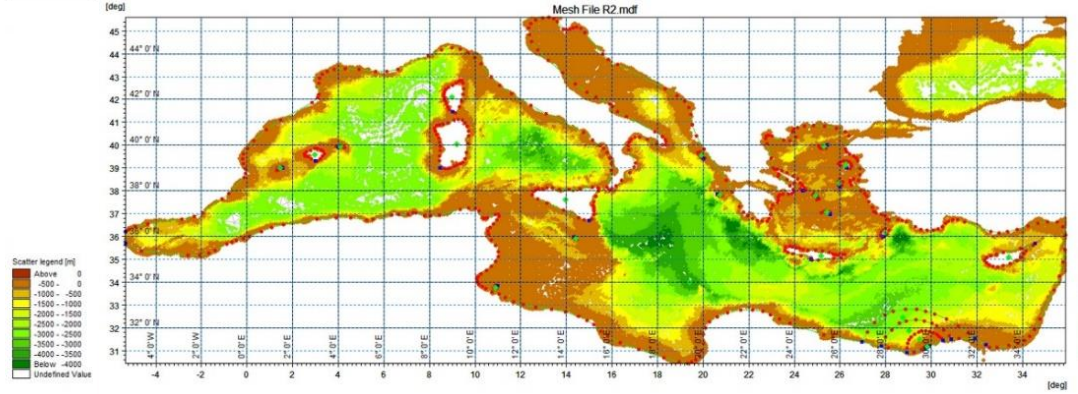
2.2 Quantitative Bathymetric Data Collection and Model Characteristics

DHI MIKE21 SW/HD FM Mesh





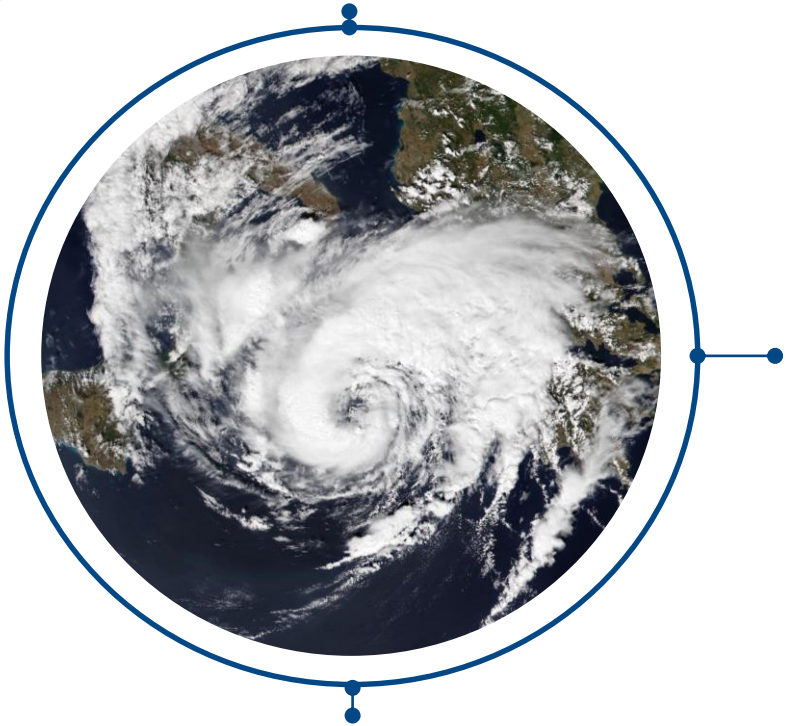




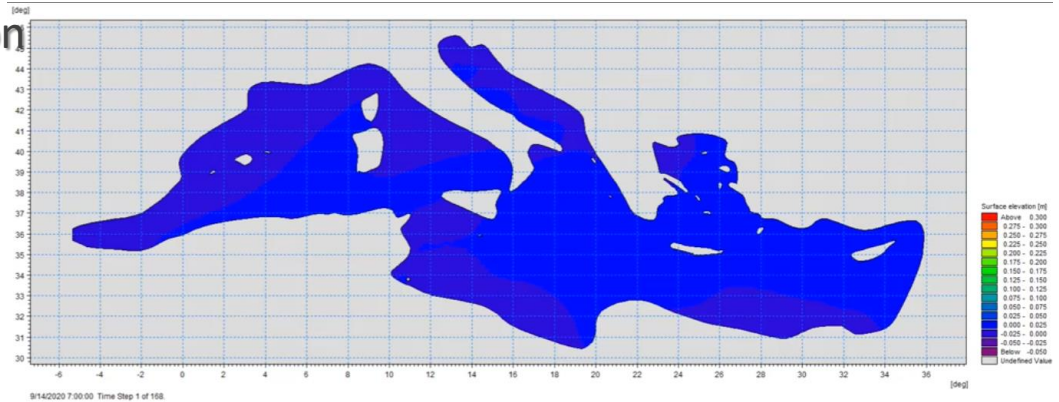
- GSHHG Dataset
- GEBCO Dataset

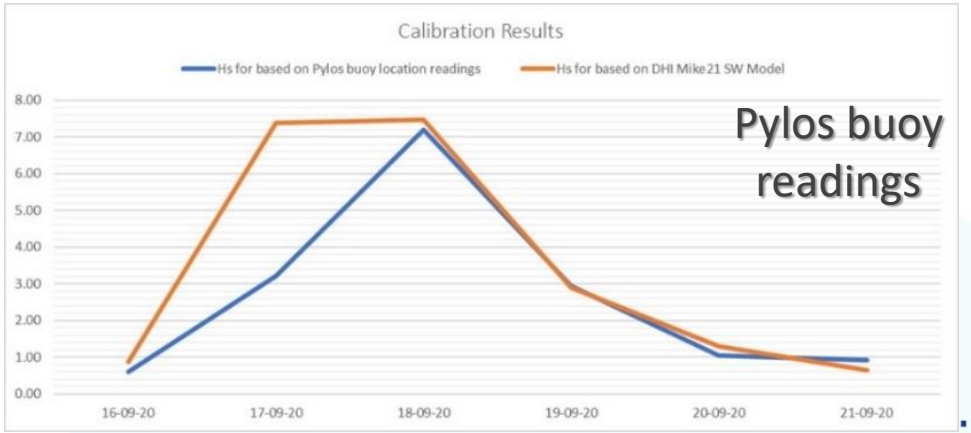
2.2 Quantitative Bathymetric Data Collection and Model Characteristics

Spectral JONSWAP fetch Growth Generation

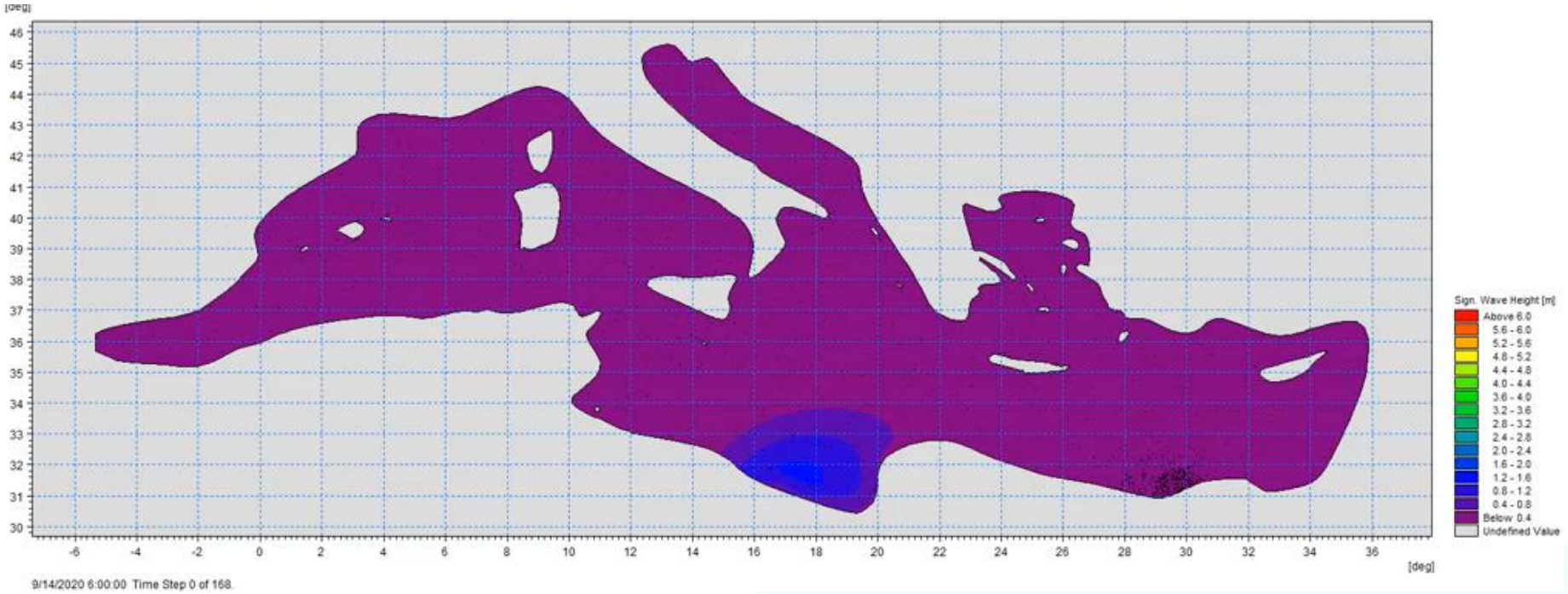


Calibration Process / Manning Number





3 Results


[deg]
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5.6 - 6.0
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4.8 - 5.2
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3.6 - 4.0
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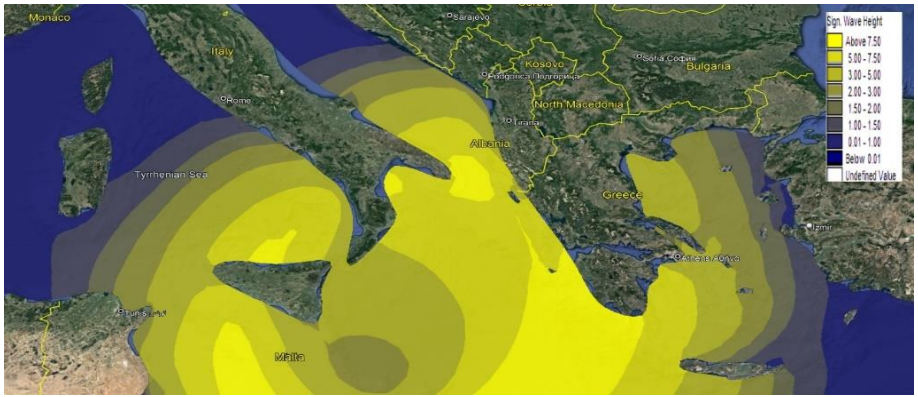
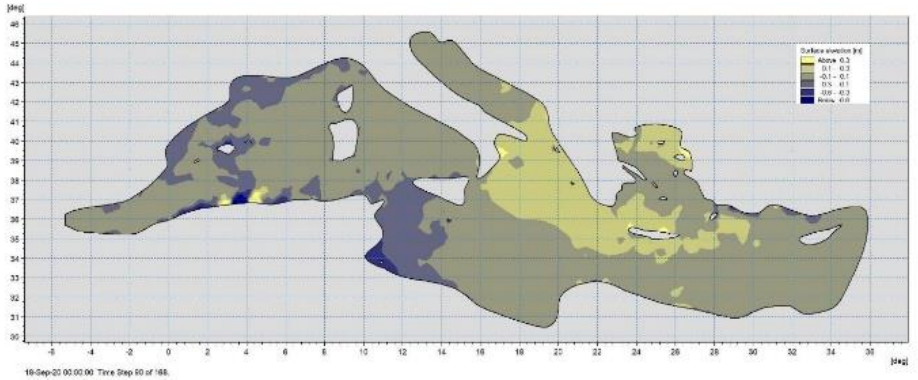
2.8 - 3.2
2.4 - 2.8
2.0 - 2.4
1.6 - 2.0
1.2 - 1.6
0.8 - 1.2
0.4 - 0.8
Below 0.4
Undefined Value

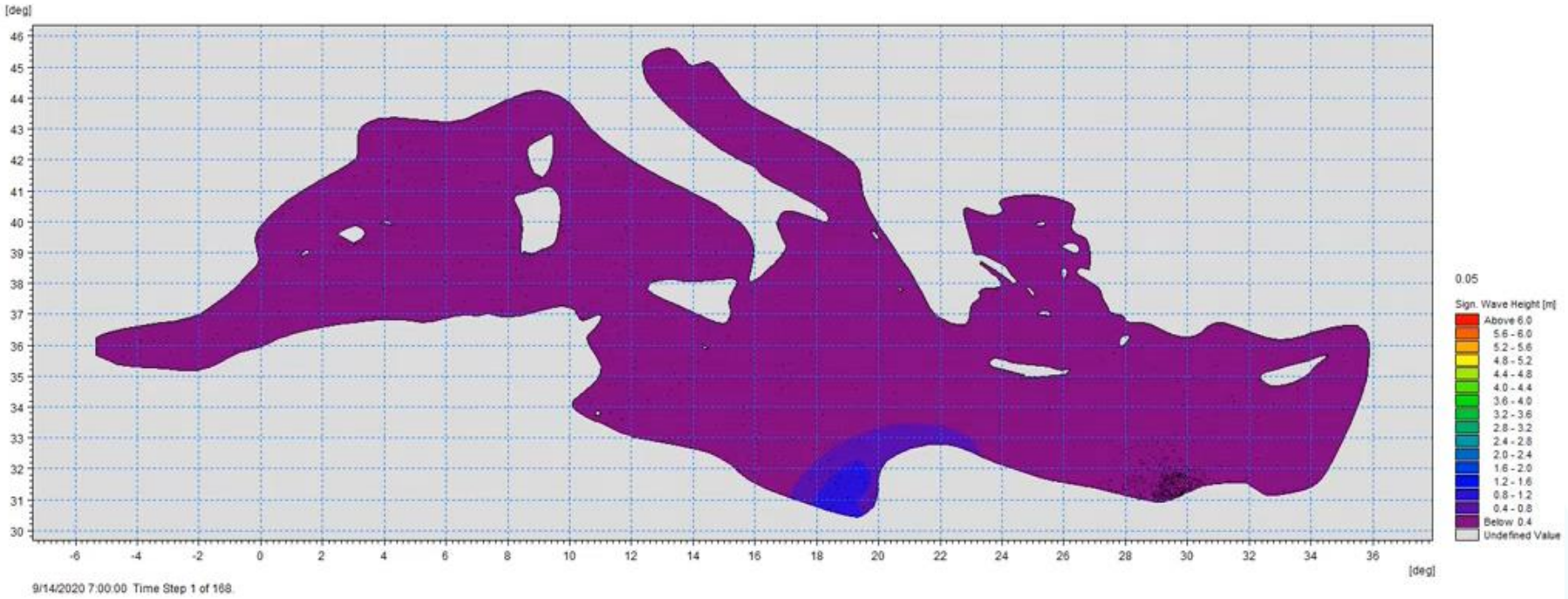
3 Results





- H_s with a value of 7.0m in the southern coastline area of Italy, 12.0m in the western part of Greece during September 17, 2020.
- S_s with a value of 40 cm in the southern coastline area of Italy, 20 cm in the western part of Greece.

3 Results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9/14/2020 7:00:00 Time Step 1 of 168
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Sign. Wave Height [m]
Above 6.0
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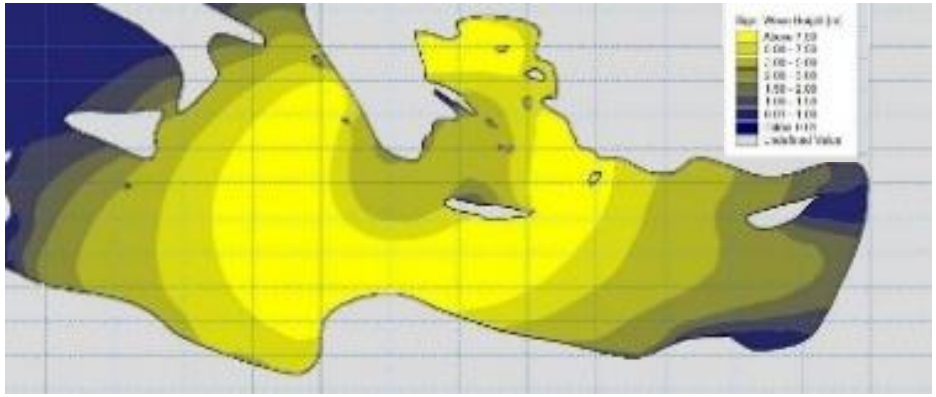
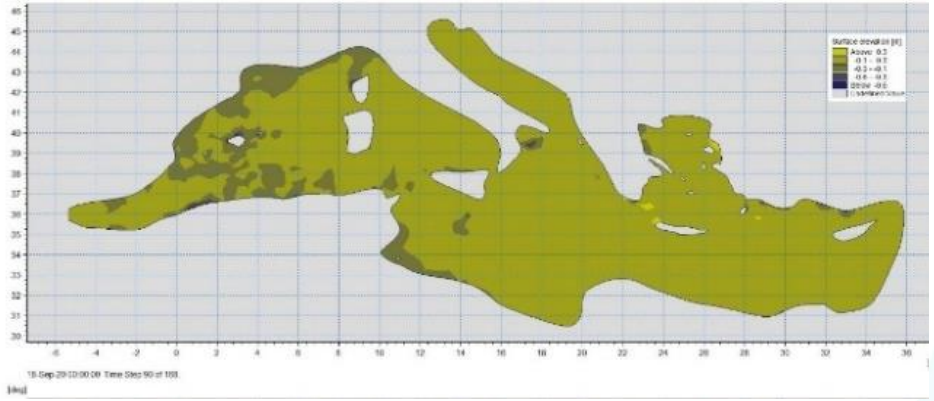
5.2 - 5.6
4.8 - 5.2
4.4 - 4.8
4.0 - 4.4
3.6 - 4.0
3.2 - 3.6
2.8 - 3.2
2.4 - 2.8
2.0 - 2.4
1.6 - 2.0
1.2 - 1.6
0.8 - 1.2
0.4 - 0.8
Below 0.4
Undefined Value

3 Results

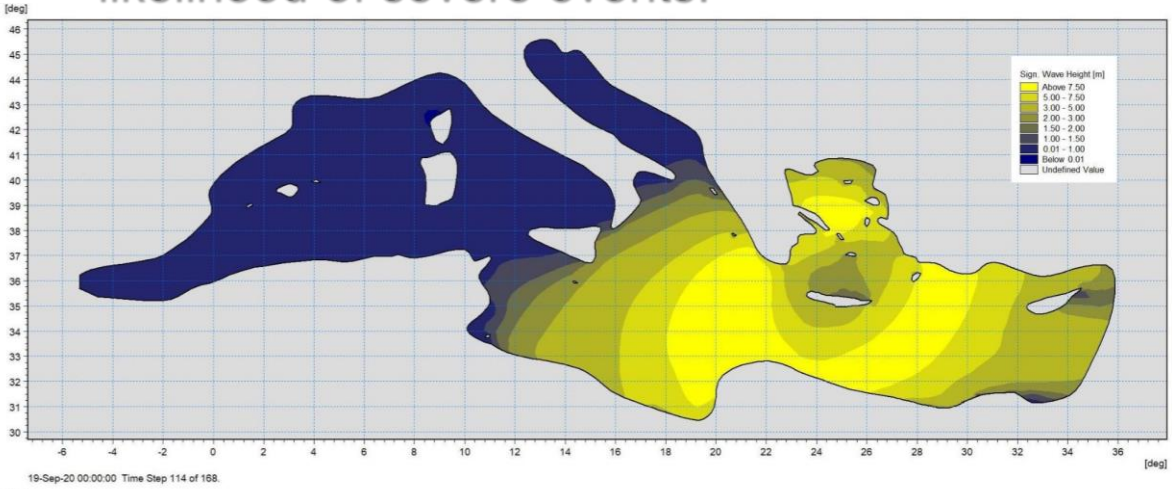




- H_s with a value of 7.5m in the southern coastline area of Italy, 10.5 in the western part of Greece, and reached more than 5 meters in front of Alexandria coastline during September 17, 2020.
- S_s with a value of 40 cm in the southern coastline area of Italy and western part of Greece.

4 Conclusion

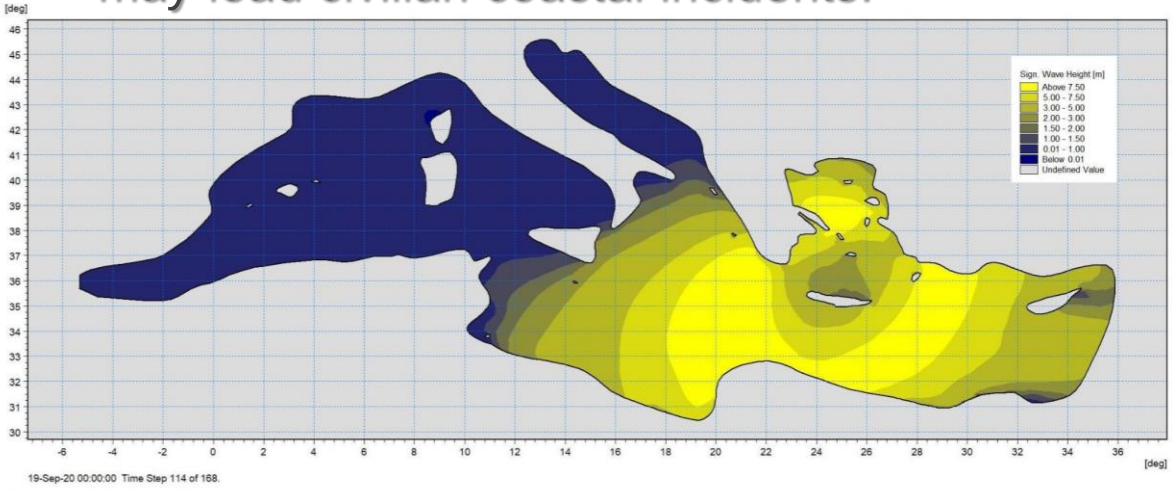
- Medicane Ianos was generated and recorded in the eastern Mediterranean Sea as a shifting likelihood of severe events.



- This article simulates Medicane Ianos to study one of the past extreme events and predict future similar atmospheric extreme events

4 Conclusion

- Expected Ss along with Hs, wave runup and overtopping can cause coastal flooding which may lead civilian coastal incidents.



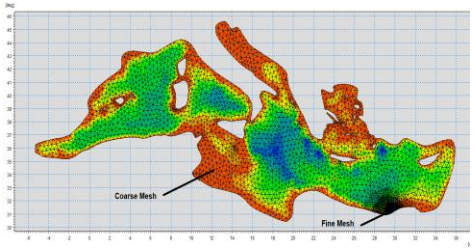
- It is recommended to preform regular flood risk assessments of climate change's impact on eastern part of Mediterranean Medicanes.

4 Conclusion

STRENGTHS

Article recommendation is aligned with the predecessors of having sustainable and resilient infrastructure against future conditions.

WEAKNESSES



OPPORTUNITIES

GHGs, Flood Risk, and Medicanes

Aim to study the threat of Medicanes and its effects through the study of Medicane Ianos as a case study

THREATS

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Thank You

Any questions?