

The logo for CIIMAR Madeira is written in a large, white, lowercase, rounded sans-serif font.

**ciimar  
madeira**

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Lecturer @ ICBAS, U. Porto  
Director of OOM

‘The Madeira island case’

# Outline

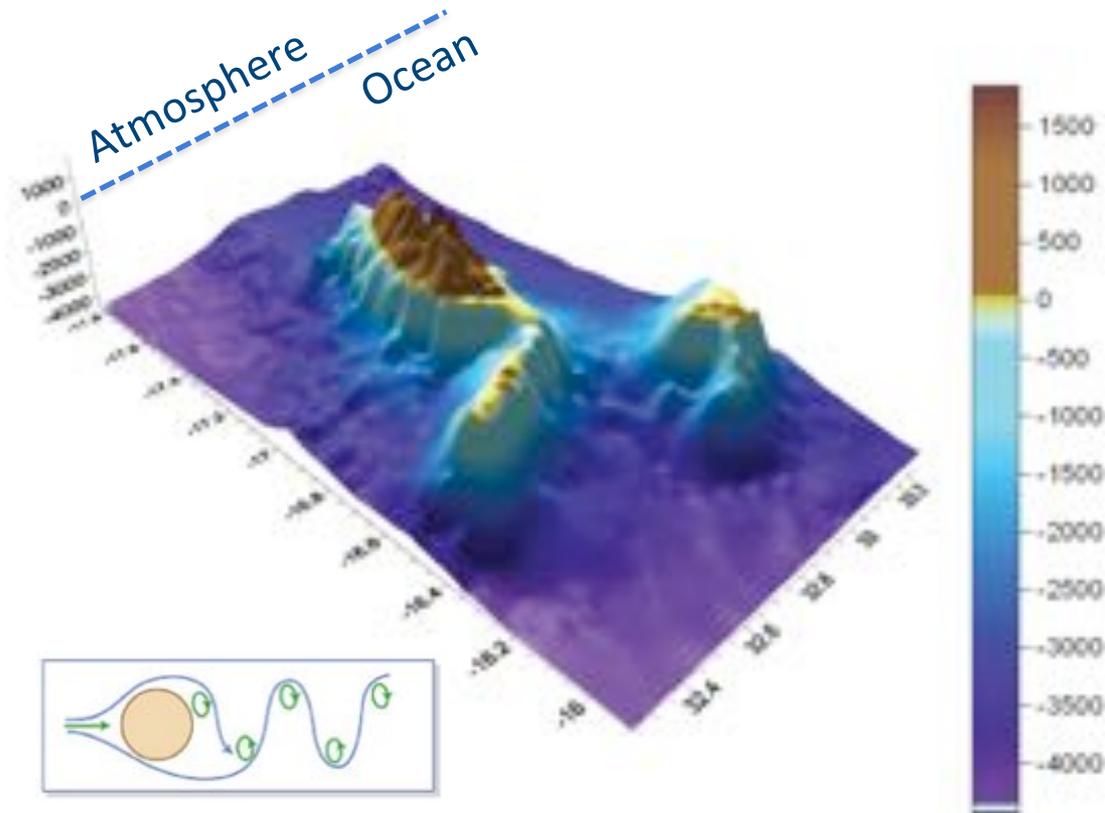
State-of-the art: perturbing geophysical fluids

Monitoring local systems with global datasets

Challenges: accurate / valid predictions?

Opportunities: couple (dynamic) systems

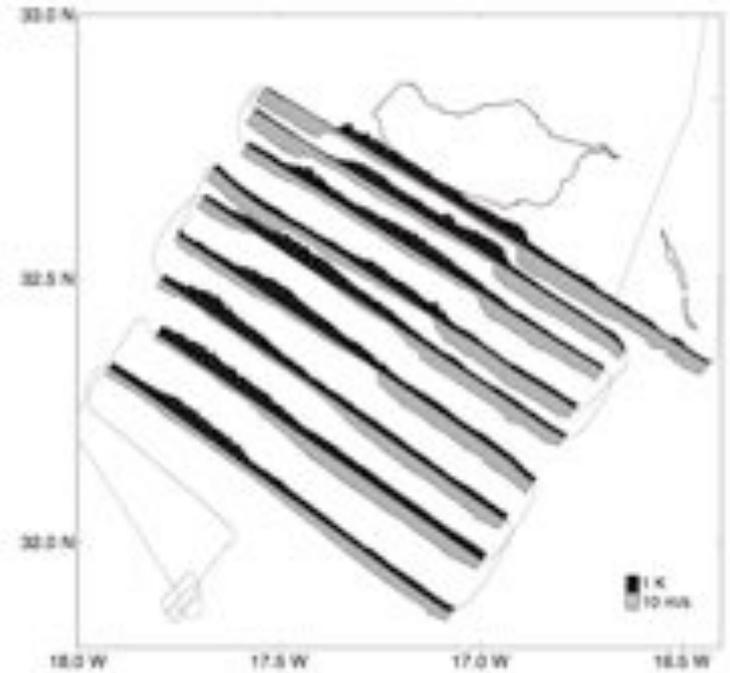
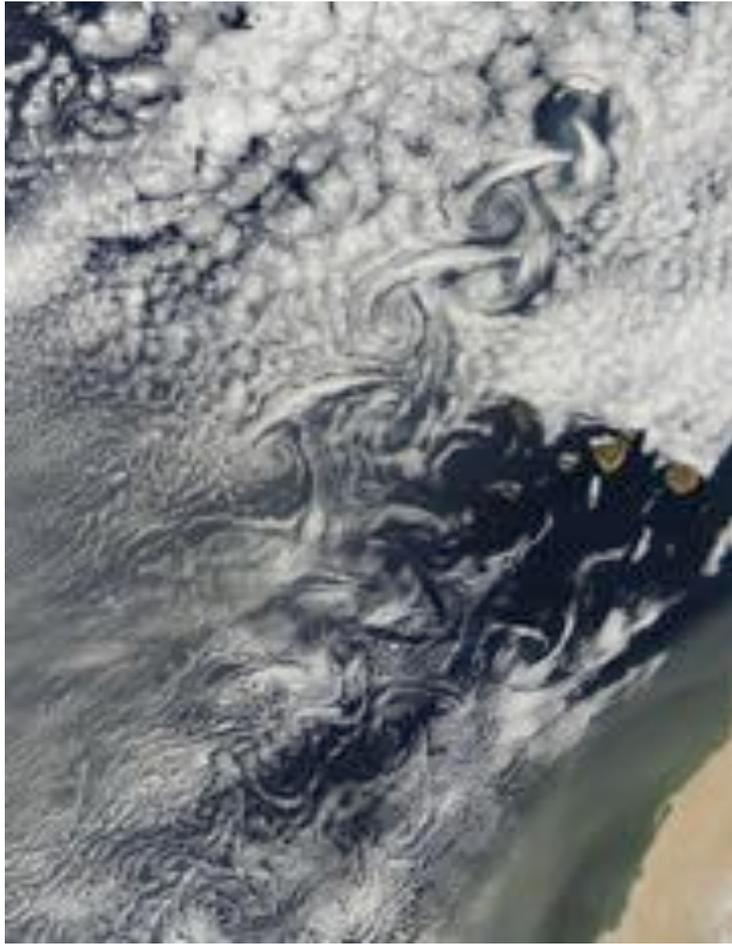
# Island Wakes → Perturbing fluids



Earth fluids:

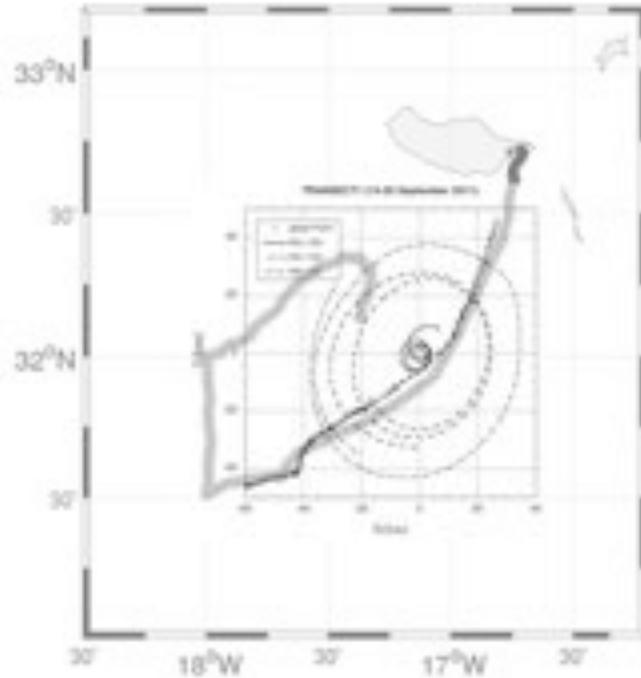
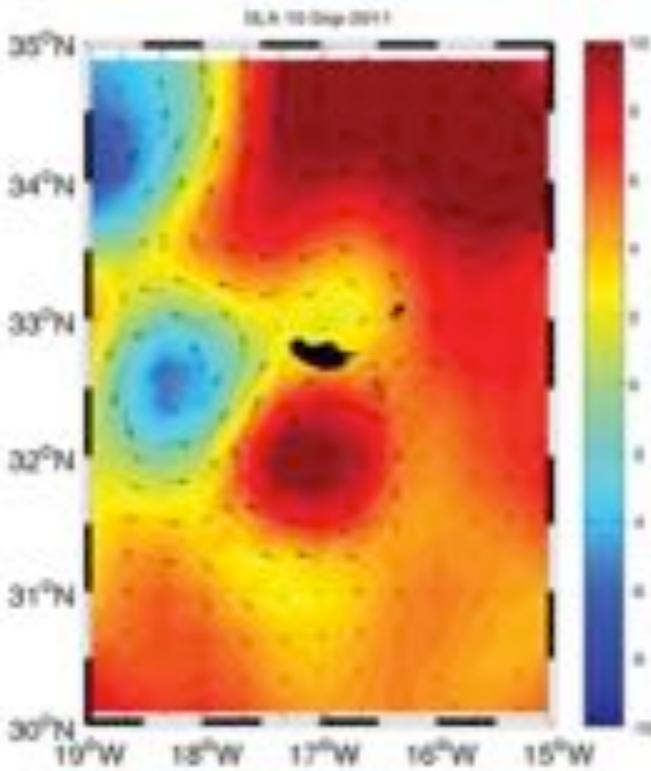
- Atmosphere
- Ocean

# Madeira Wakes: Atmos + Ocean

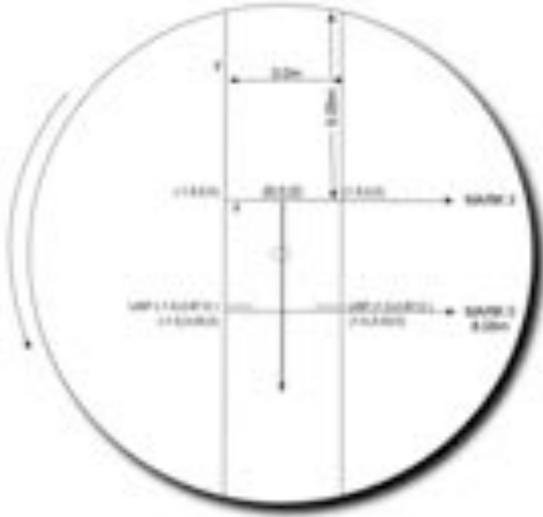




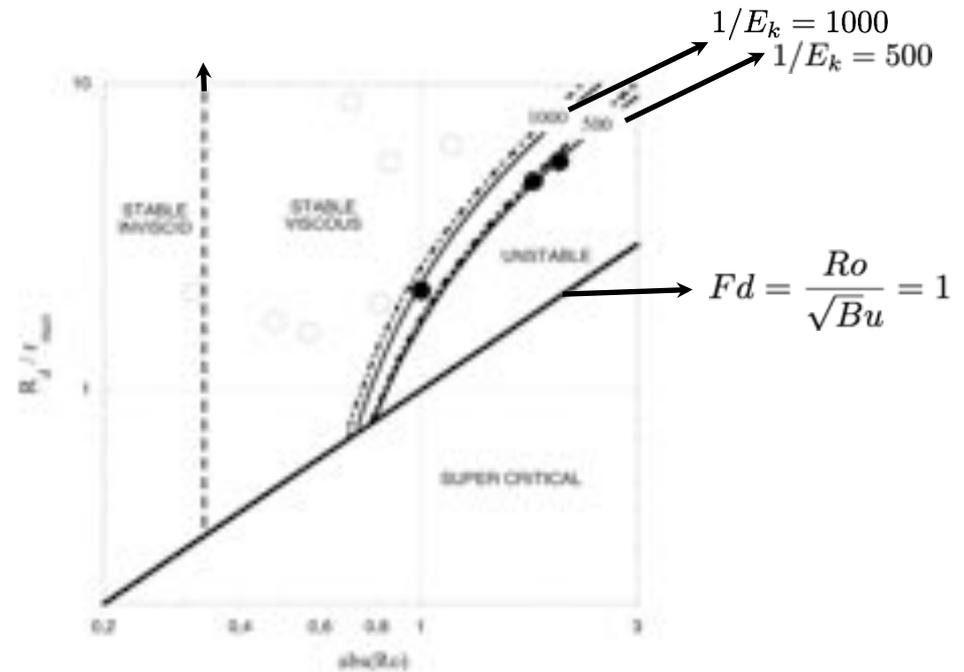
# Madeira Wakes: Atmos + Ocean



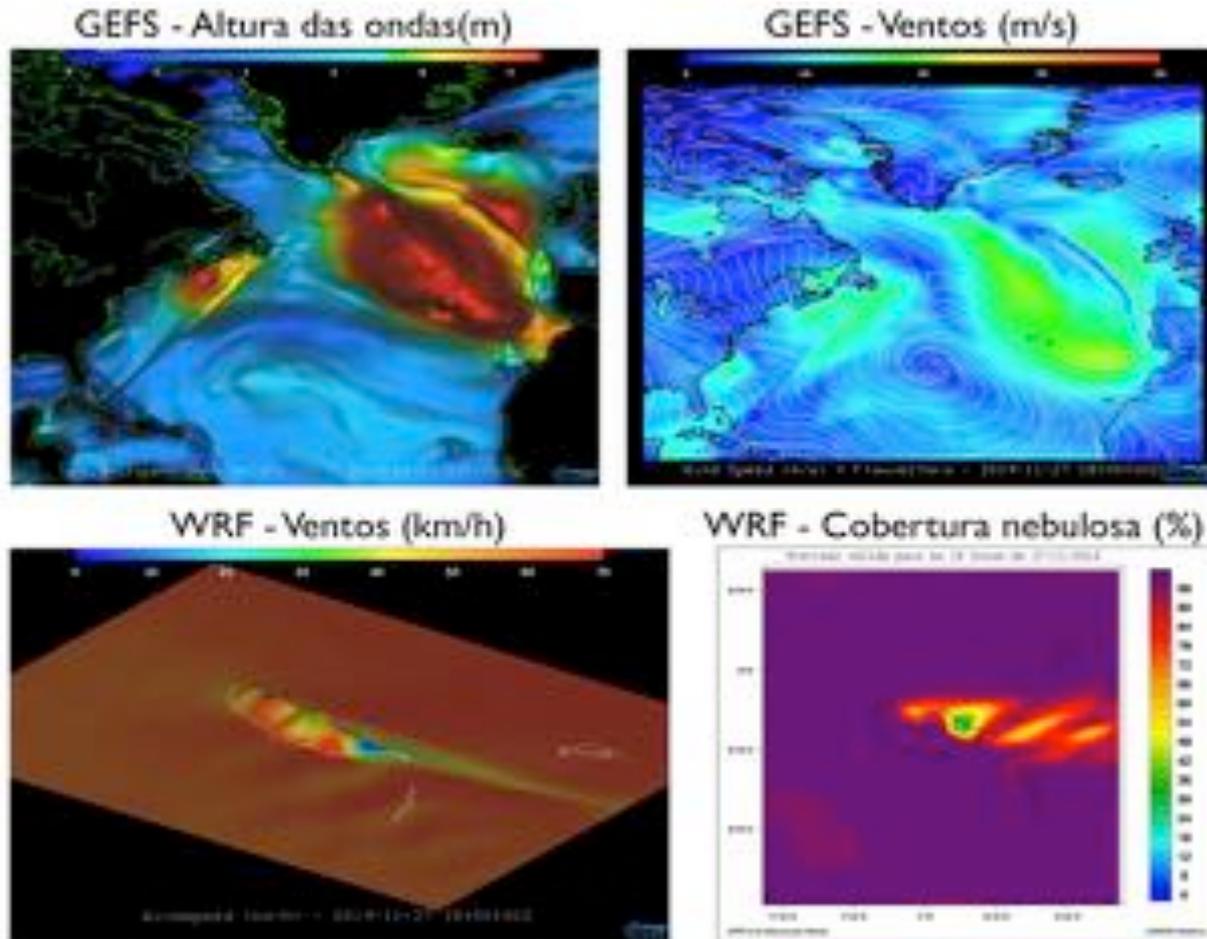
# Coriolis platform



# Laboratory studies: HYDRALAB III, FP6 / FP7



# Monitoring: Global → Local (enough?)

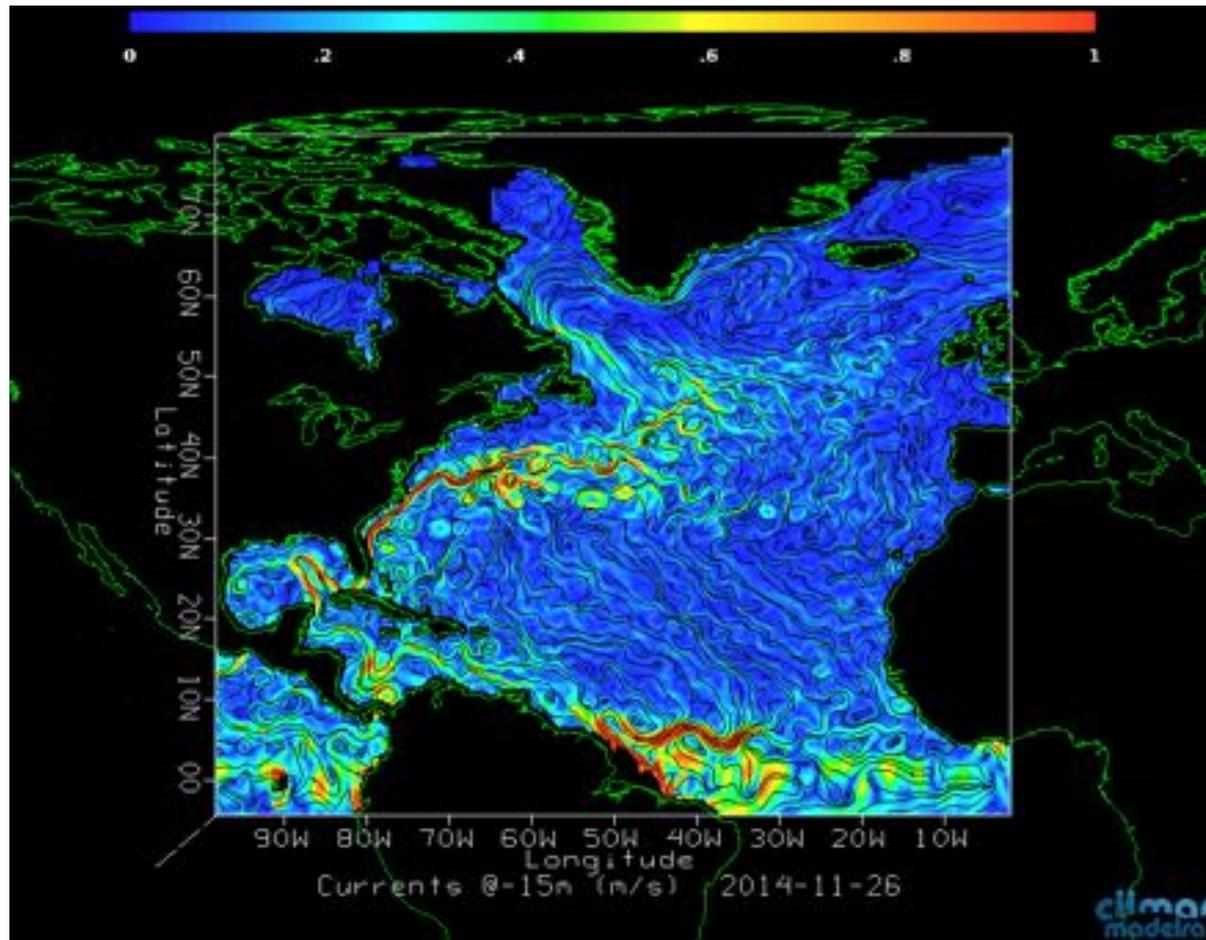


<http://home.ciimarmadeira.org>



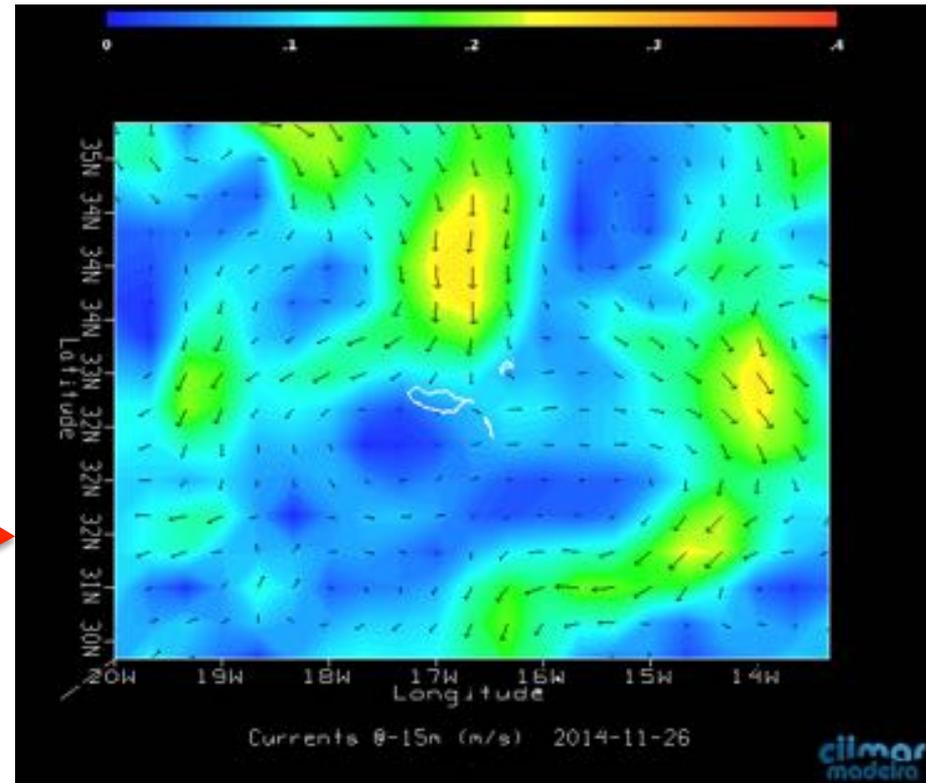
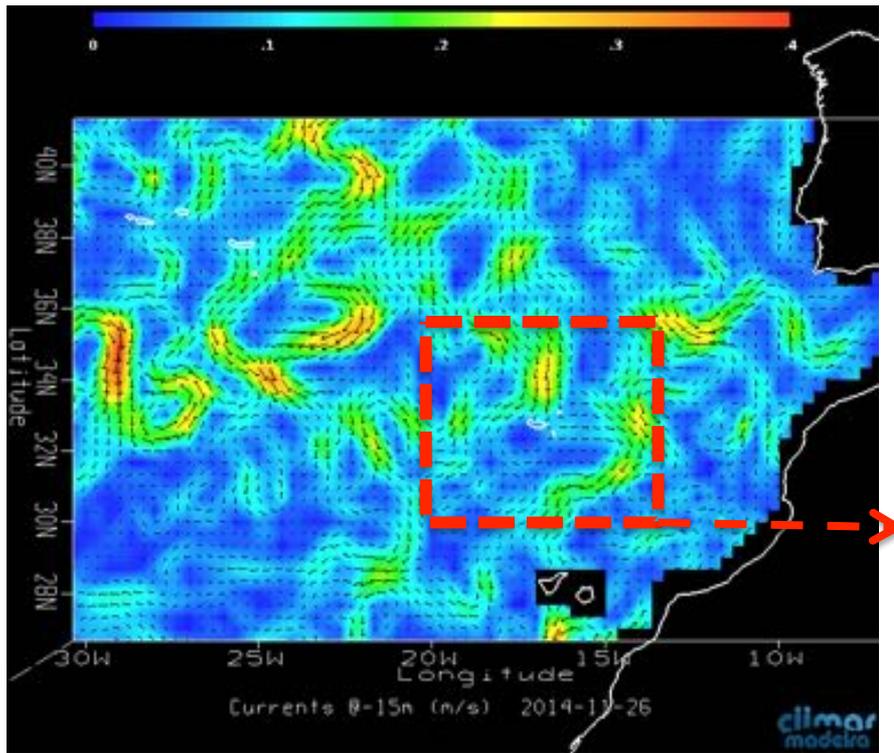
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# Monitoring: Global → Local (Satellite)



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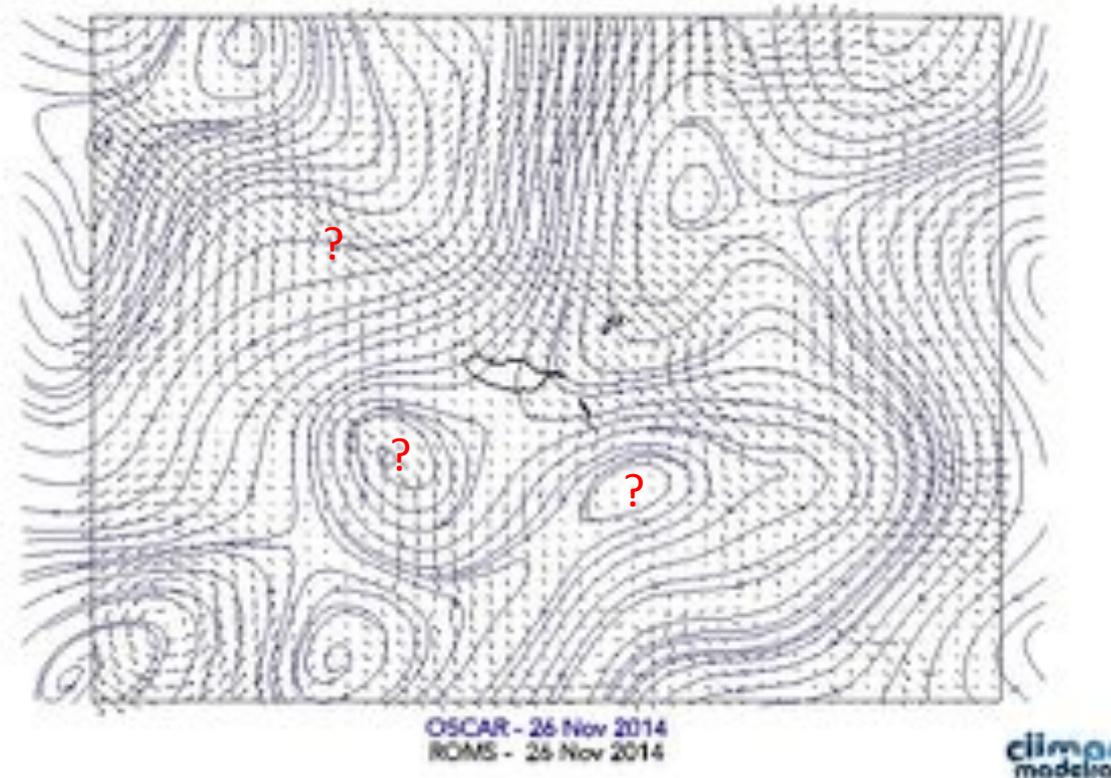


<http://home.ciimarmadeira.org>

# Monitoring: Global → Local

Satellite Observations

Model forecast



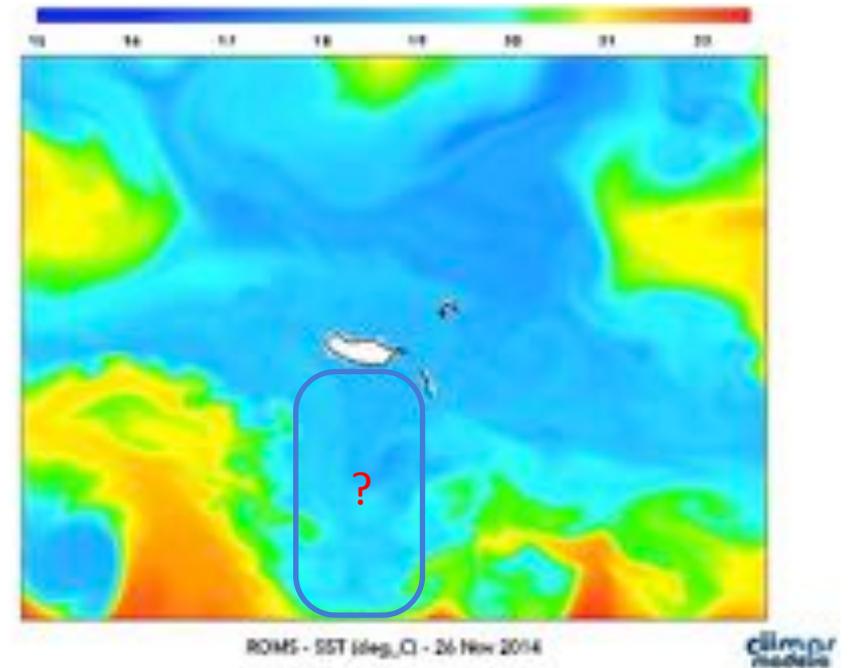
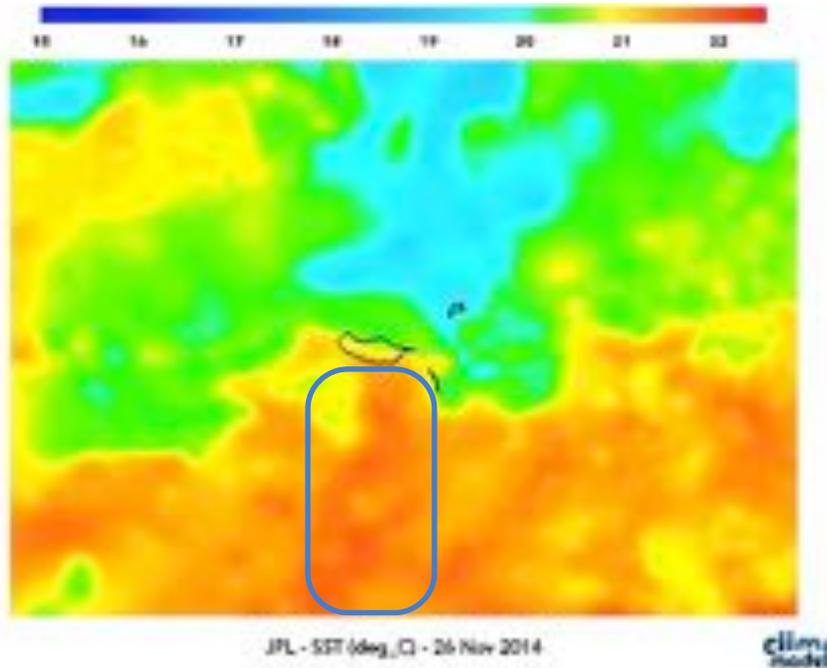
Island (local) dynamics ill represented Models

**CHALLENGE!**

# Monitoring: Global → Local (Satellite)

Satellite Observations

Model forecast



Island (local) dynamics ill represented Global & Regional Models  
**CHALLENGE!**

# Weak local forecasts have (potentially) negative impact



February, 2010  
↓  
Claimed 70 lives



November  
↓  
Claimed > 1 M €

# Weak local forecasts have (potentially) strong impact



Short-notice inoperative  
Ports



Winter, 2009 / 2010



Claimed > 4 M €

Can we do a better job at predicting the atmosphere and ocean in small islands such as Madeira?

**YES WE CAN!**

How?

More / better local measurements to validate forecasting models

Use coupled air-sea models to capture local variability

Assimilate ('representative') local-data onto models

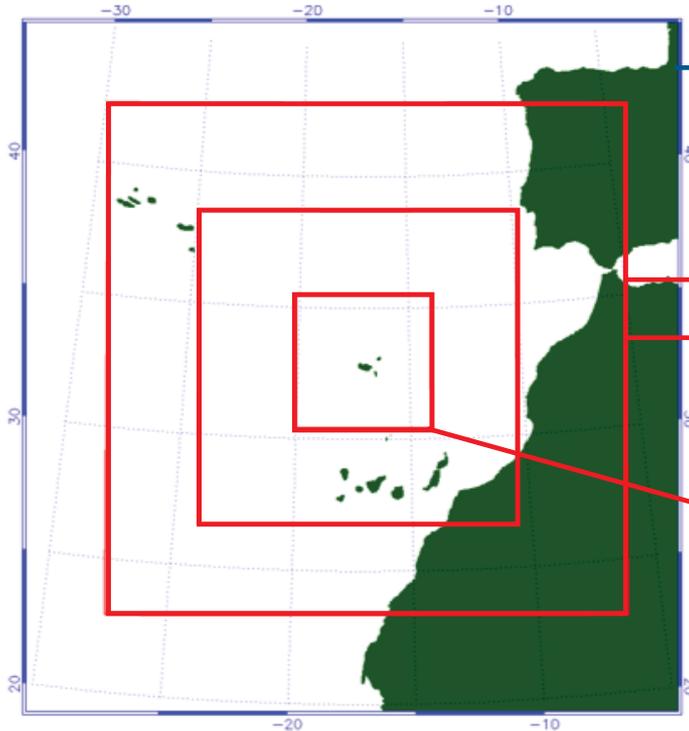
i.e. DO NOT depend solely on Global datasets & downscaled predictions!

# Solution: 'practicing what we preach'



Marine Meteorology Division  
Monterey CA USA

COAMPS



Global



Regional



Local

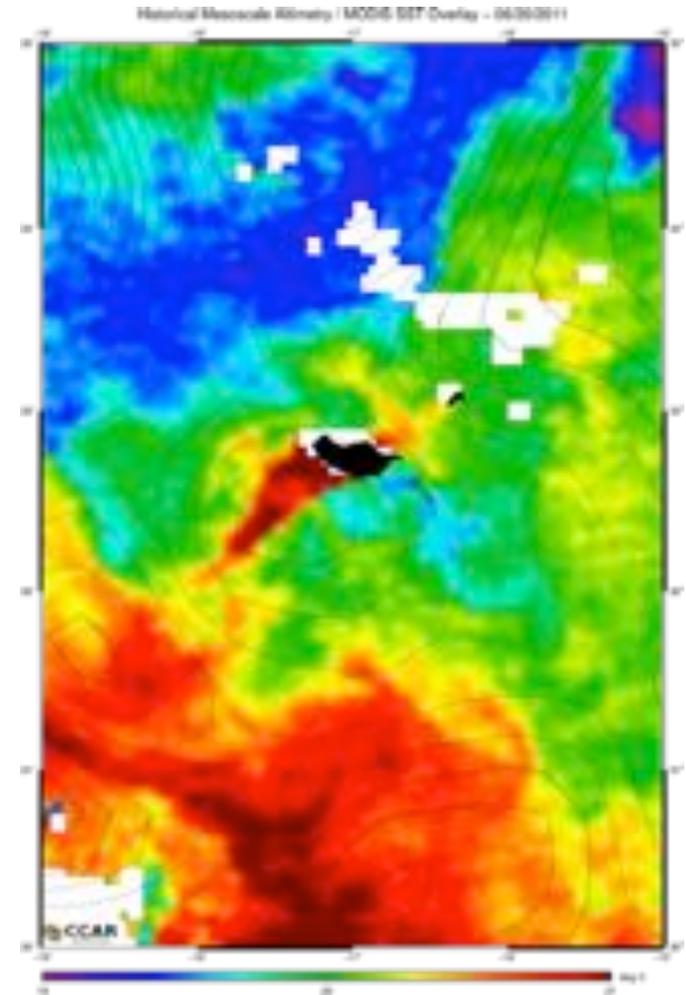
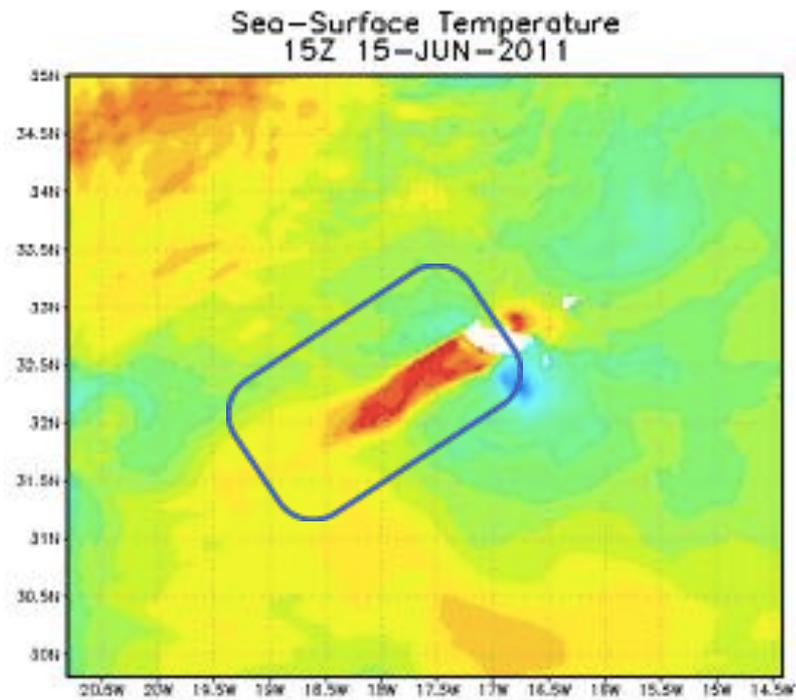
Atmos



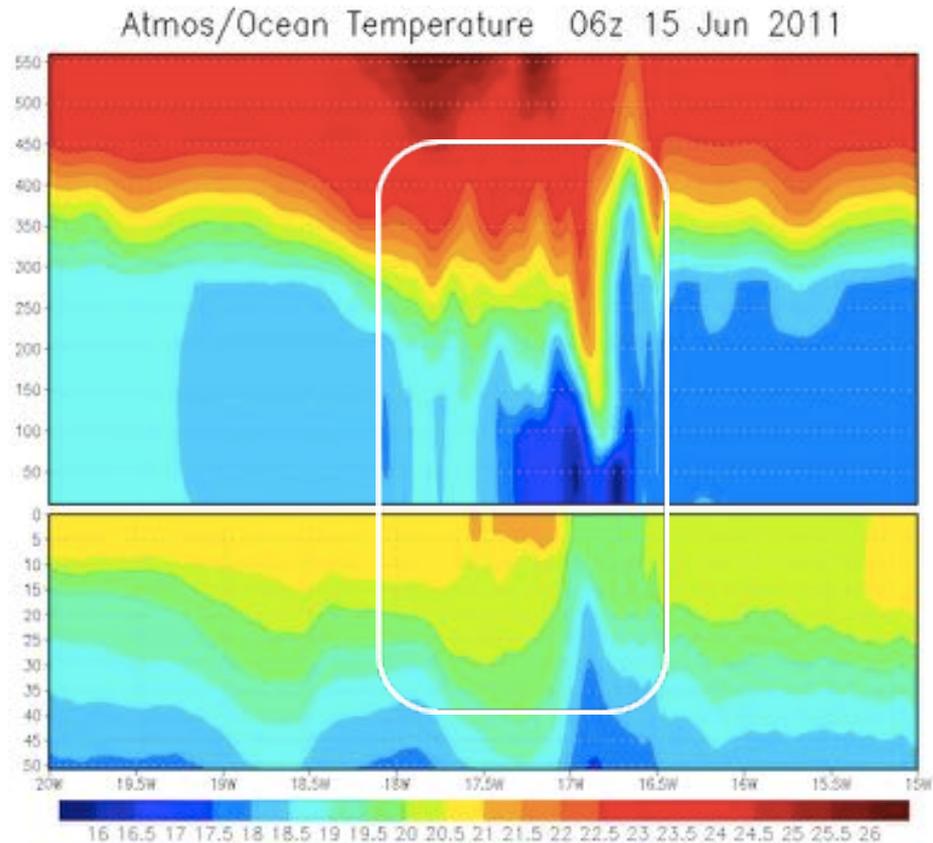
Ocean



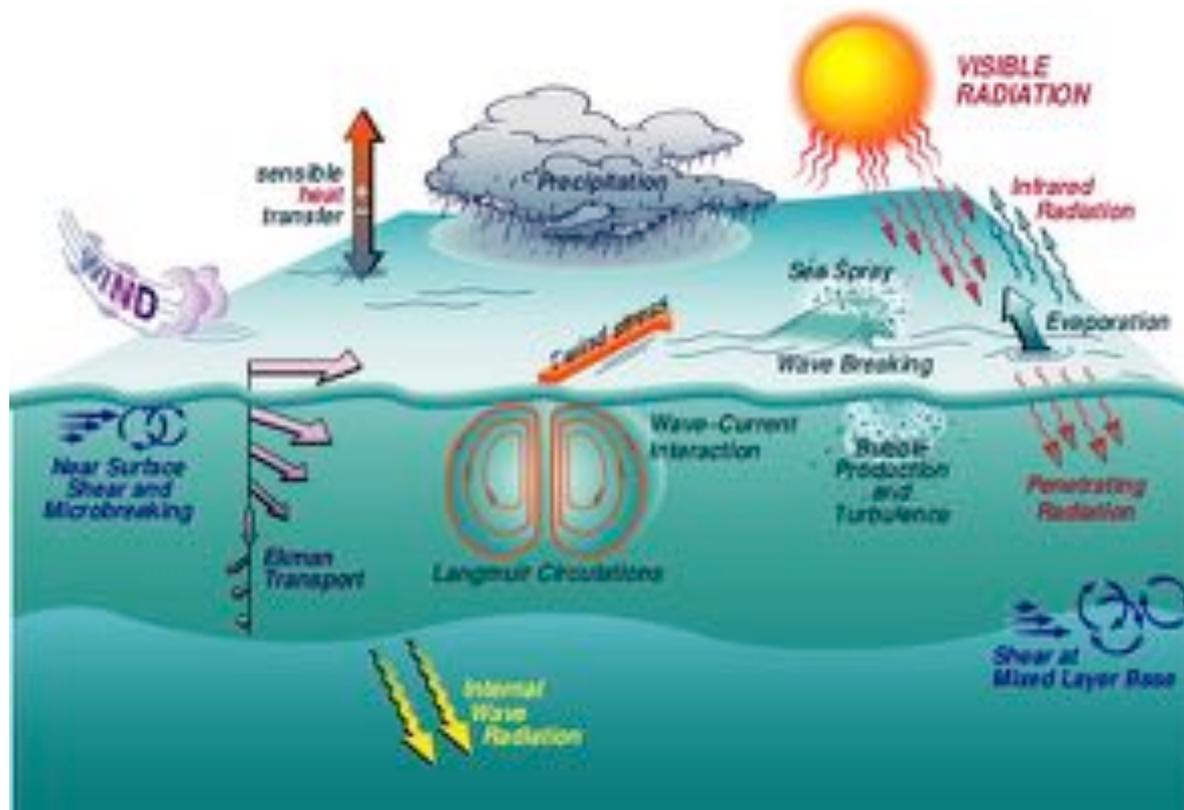
# Boundary layer interaction



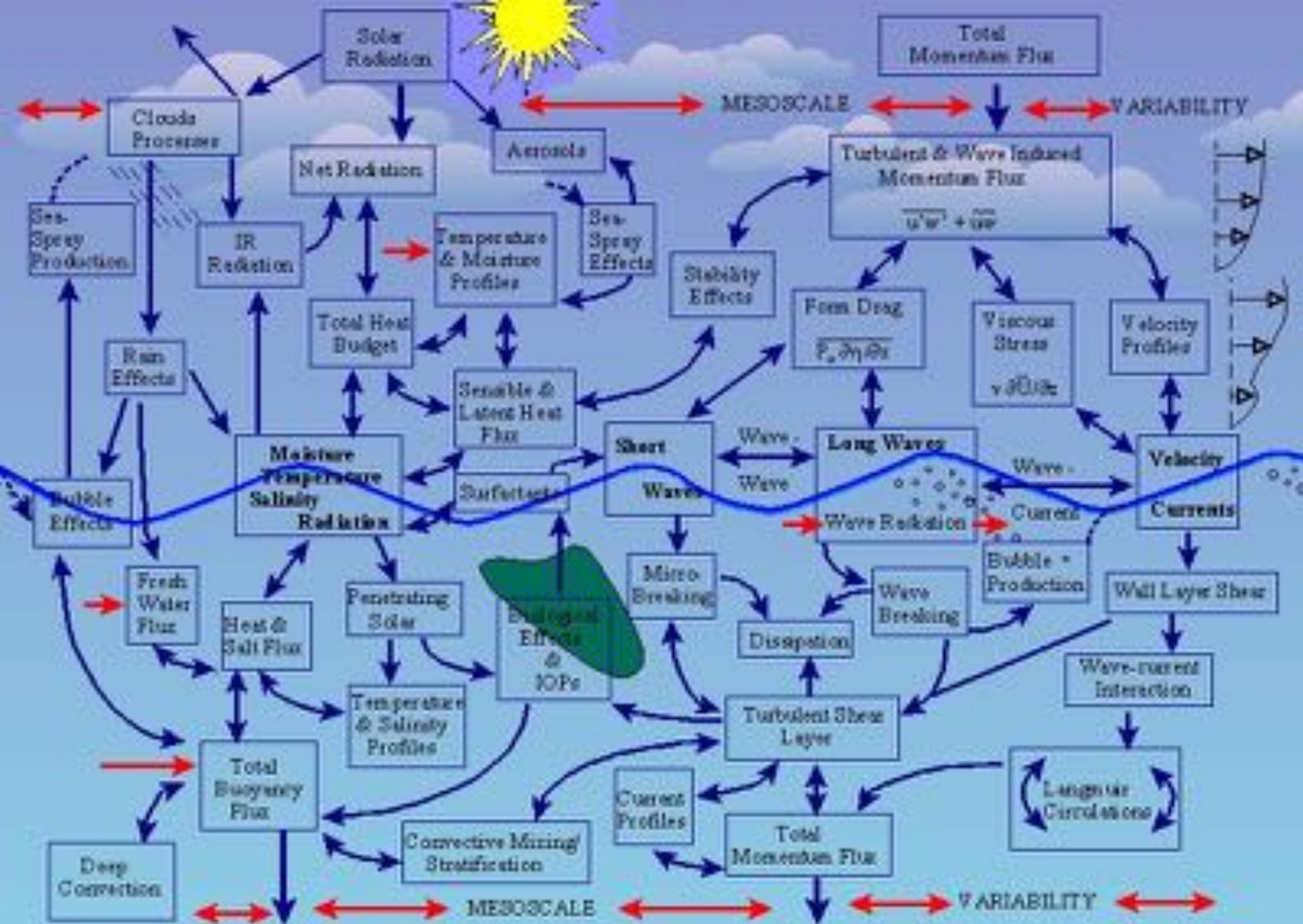
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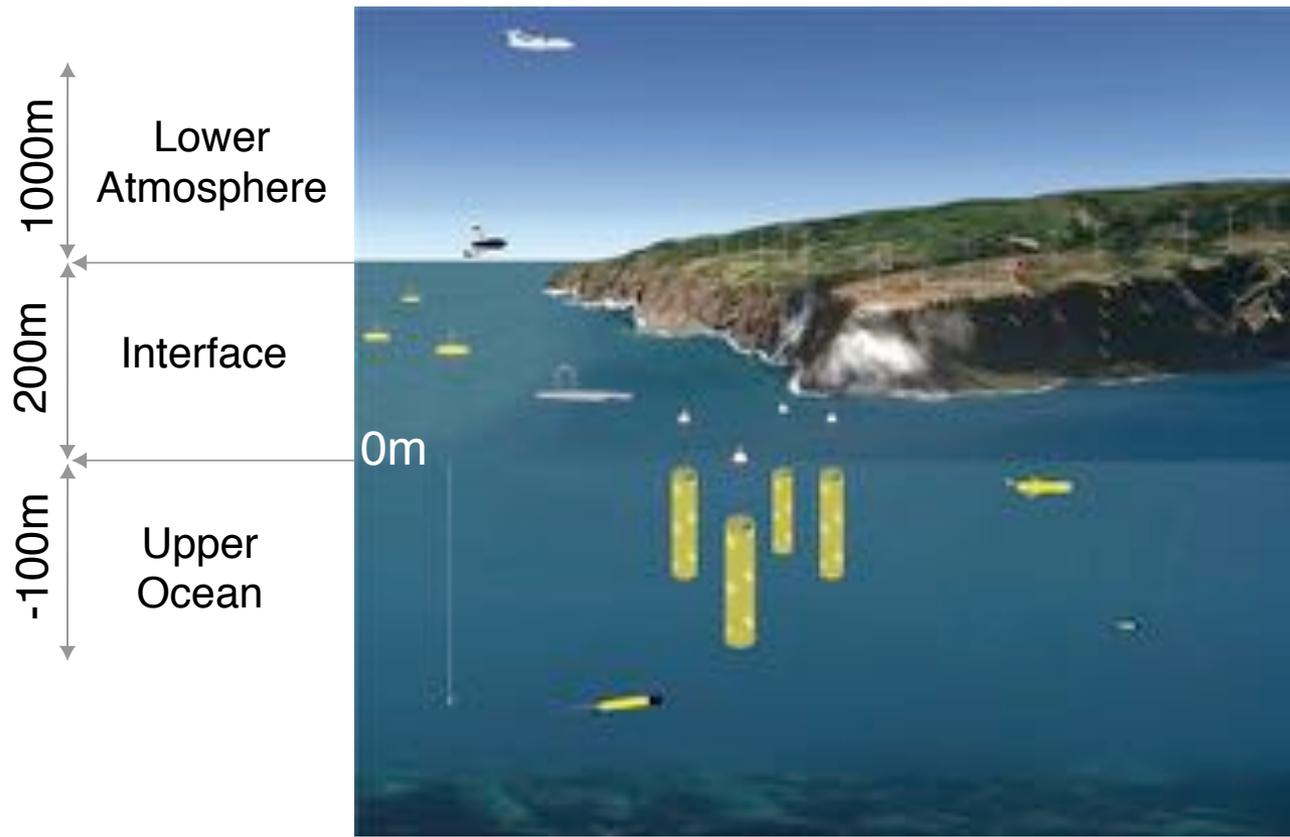


Source: Coupled Boundary Layers Air-Sea Transfer Defense Research Initiative (CBLAST-DRI)



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# Opportunity: Madeira is an excellent system to study the interface



It is real!





Thank you!