An Oil Spill Monitoring System in Brazil

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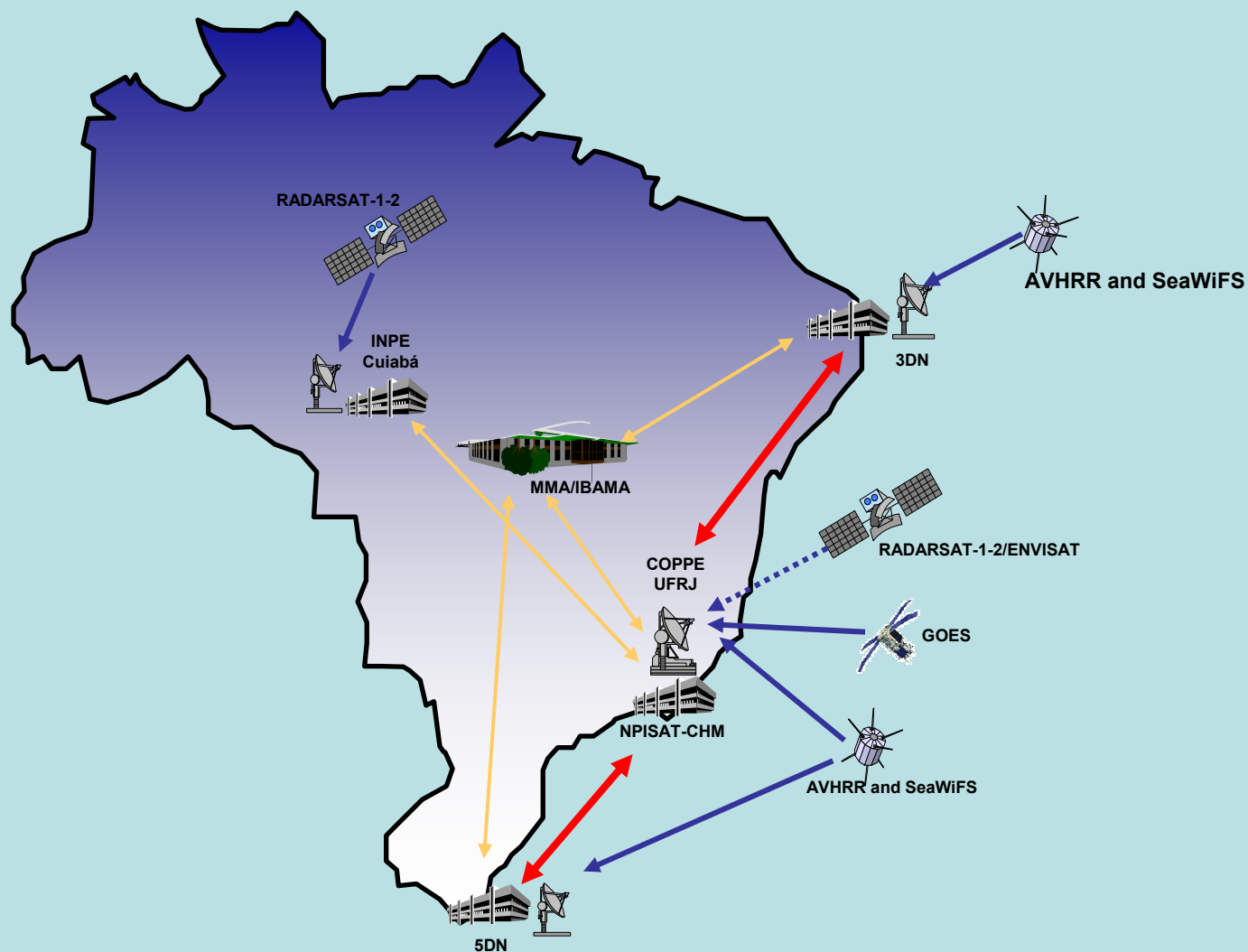
Partners

Objectives

✓ **Provide marine environment surveillance to oil spill and seepage detection;**

✓ **Provide, to the decision makers, information to support remediation actions.**

Distribution Network

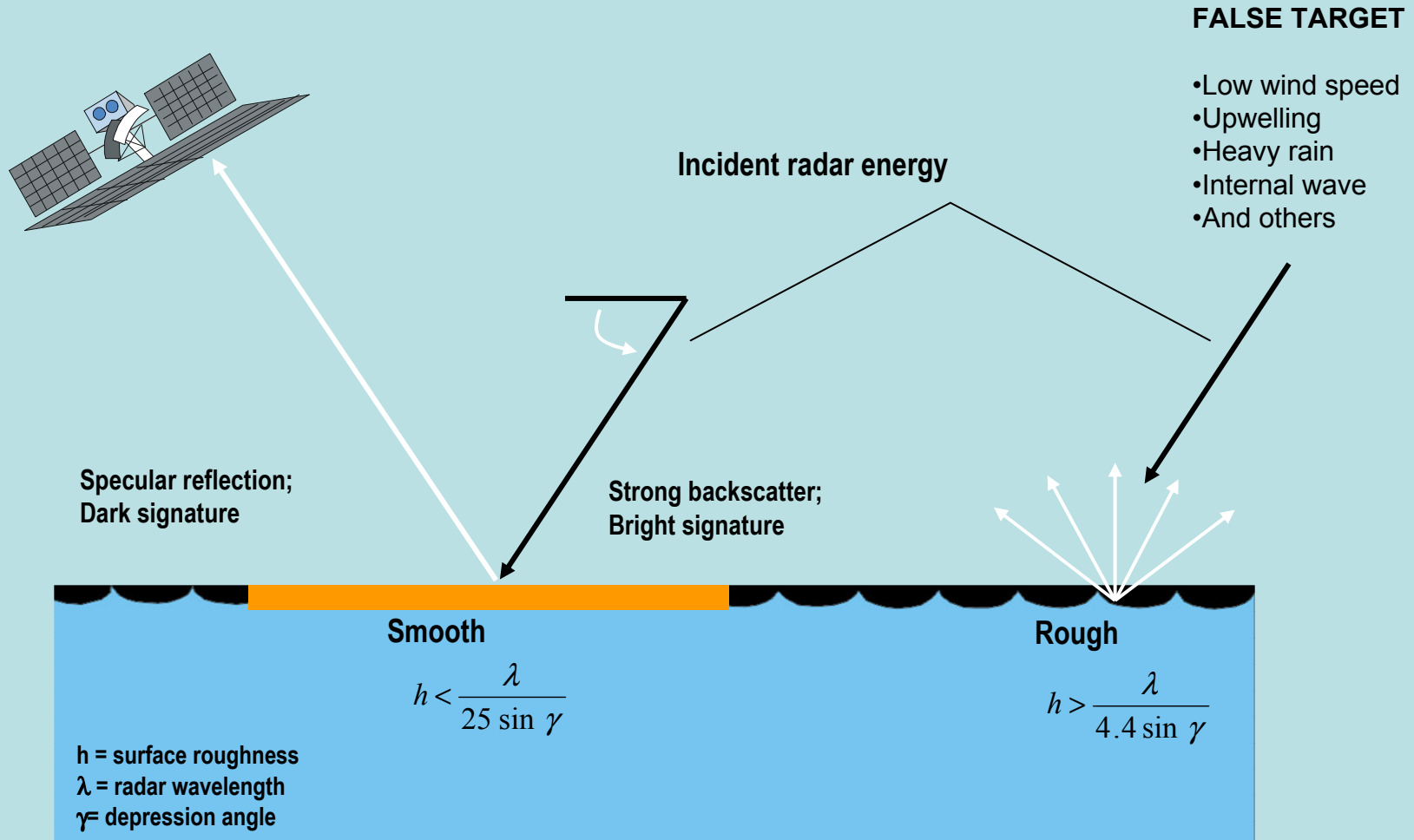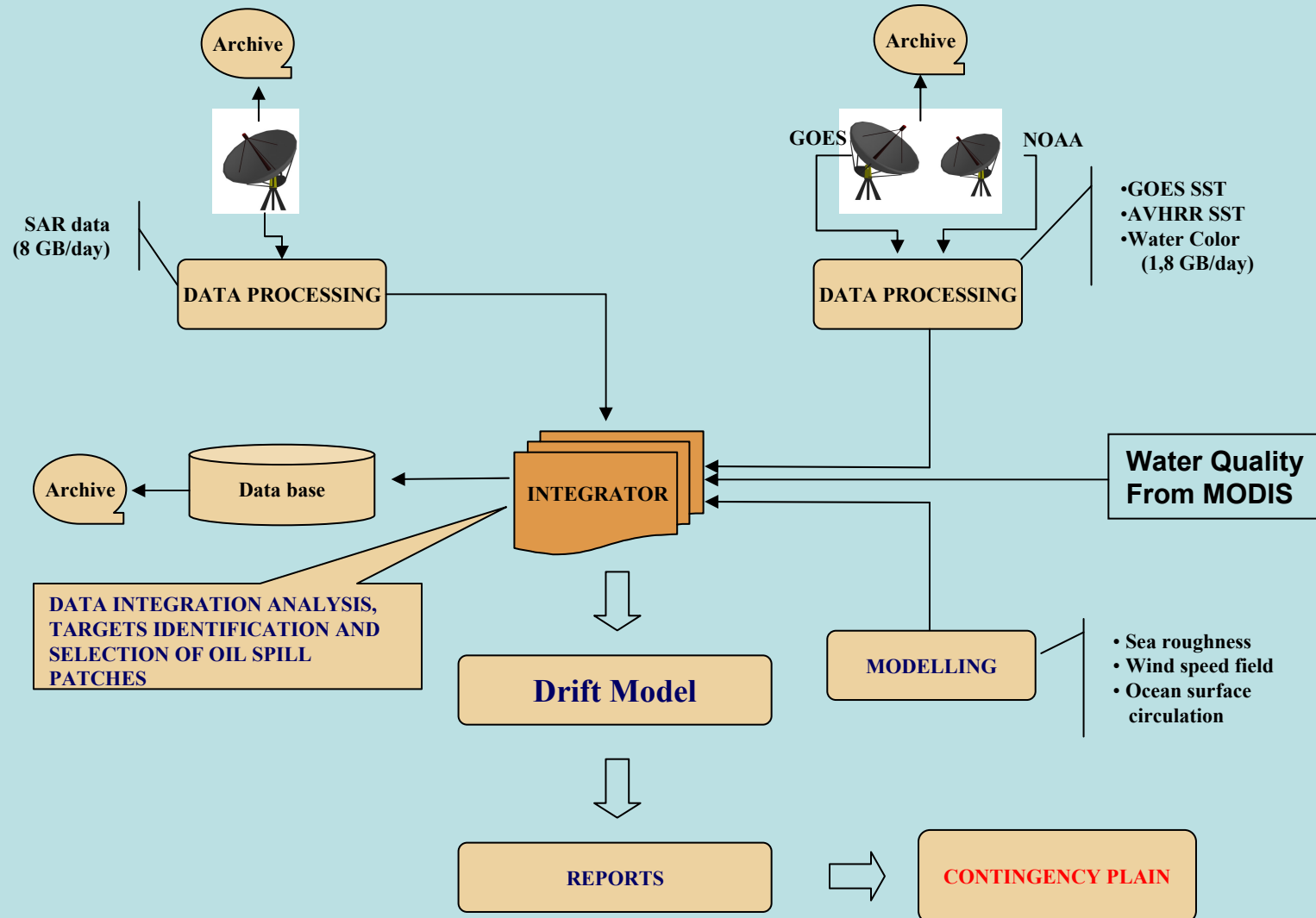# Monitoring Centres Coverage

1. Belém

2. Natal

3. Brasília
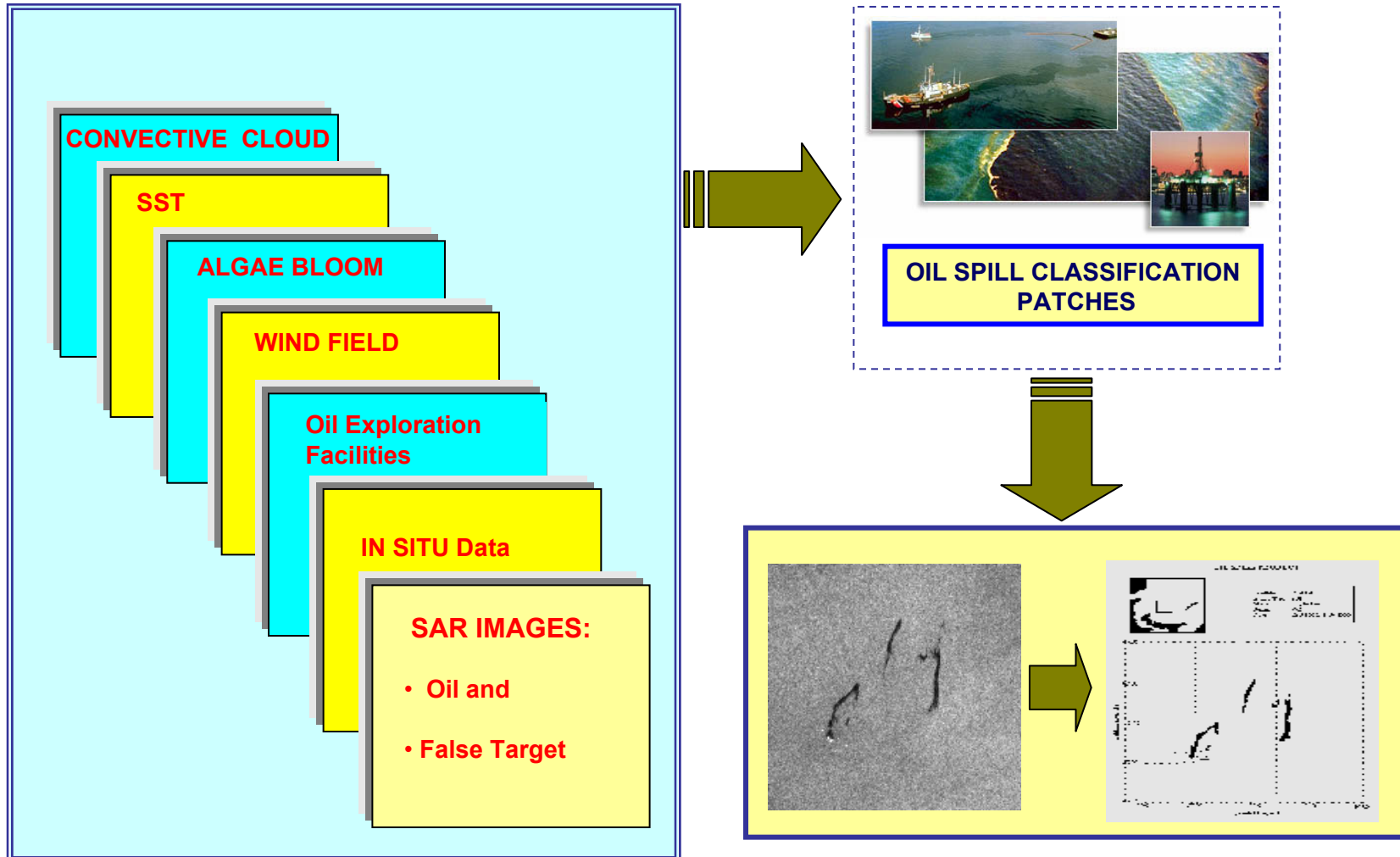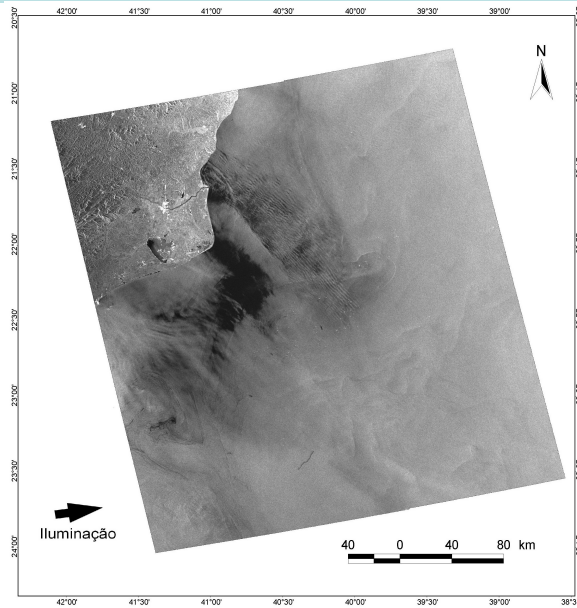
4. Rio de Janeiro

5. Rio Grande

Methodology

FALSE TARGET

- Low wind speed
- Upwelling
- Heavy rain
- Internal wave
- And others

Incident radar energy

**Specular reflection;
Dark signature**

**Strong backscatter;
Bright signature**

Smooth

$$h < \frac{\lambda}{25 \sin \gamma}$$

Rough

$$h > \frac{\lambda}{4.4 \sin \gamma}$$

**h = surface roughness
λ = radar wavelength
γ= depression angle**

System

Data Integration

INTEGRATOR

- CONVECTIVE CLOUD
- SST
- ALGAE BLOOM
- WIND FIELD
- Oil Exploration Facilities
- IN SITU Data
- SAR IMAGES:
  - Oil and
  - False Target

OIL SPILL CLASSIFICATION PATCHES
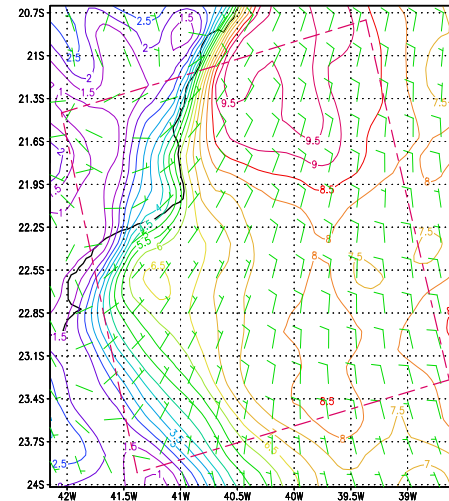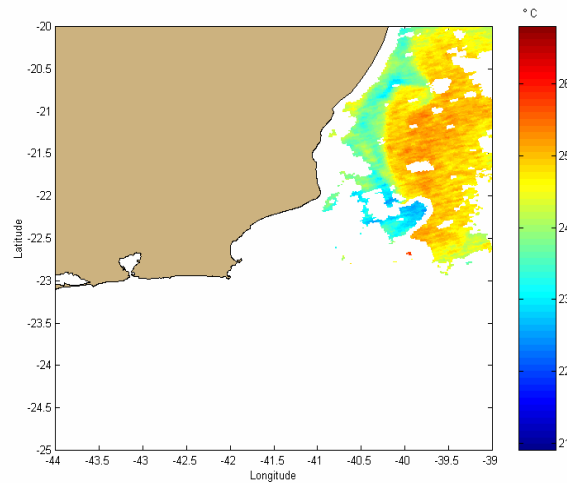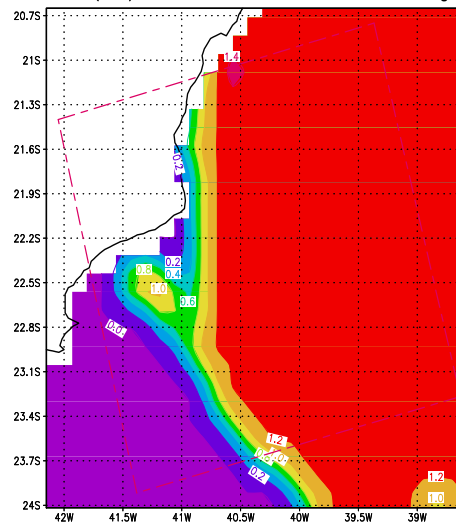
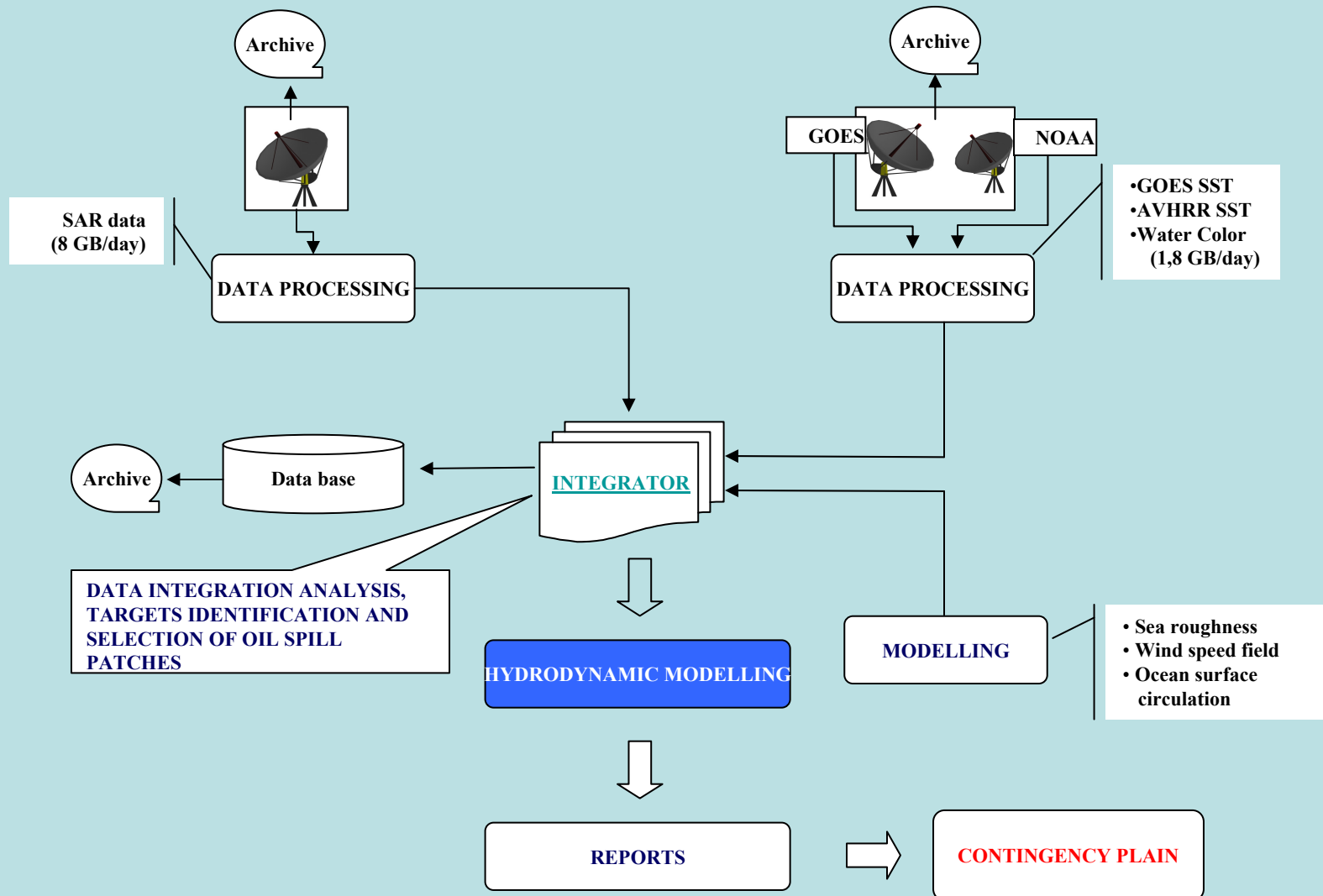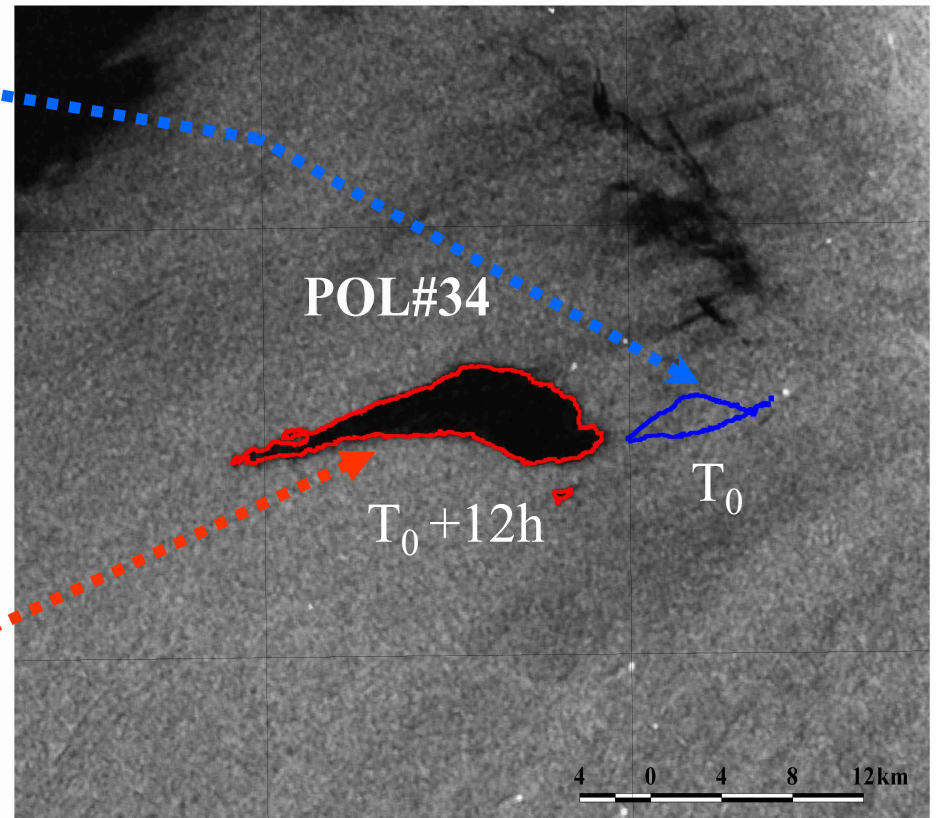# Data Integration- Atmospheric Effects
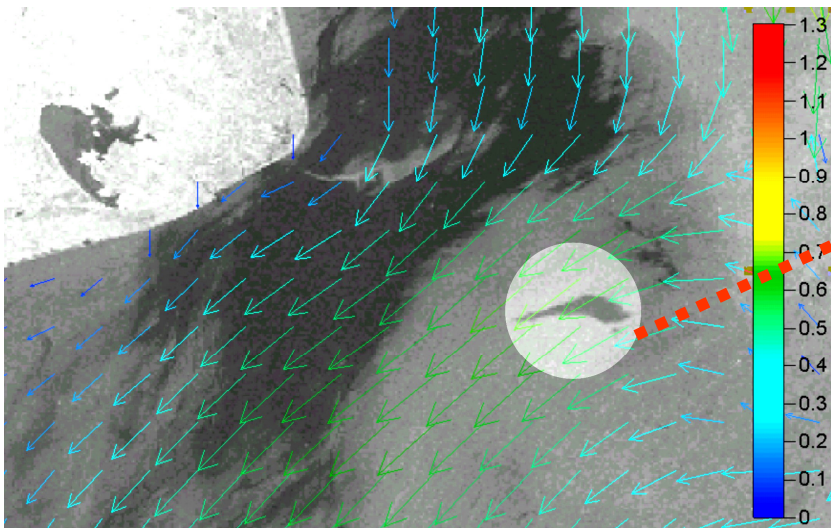
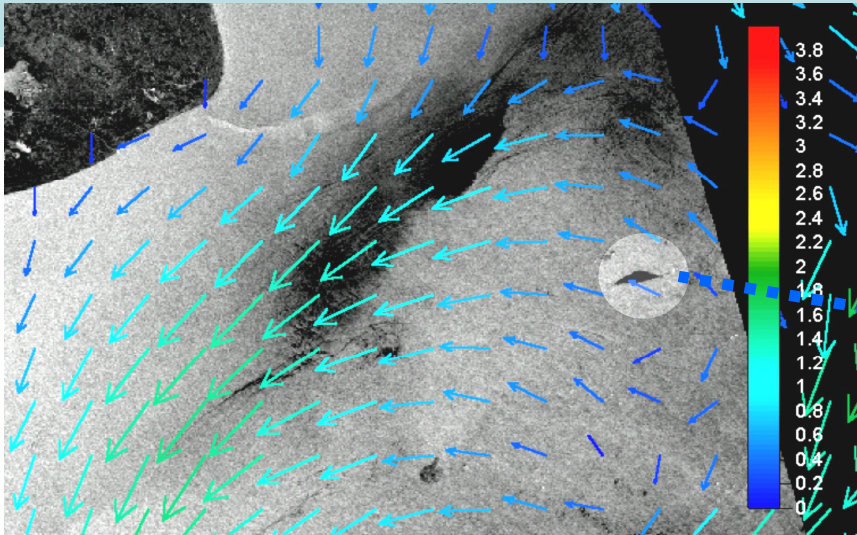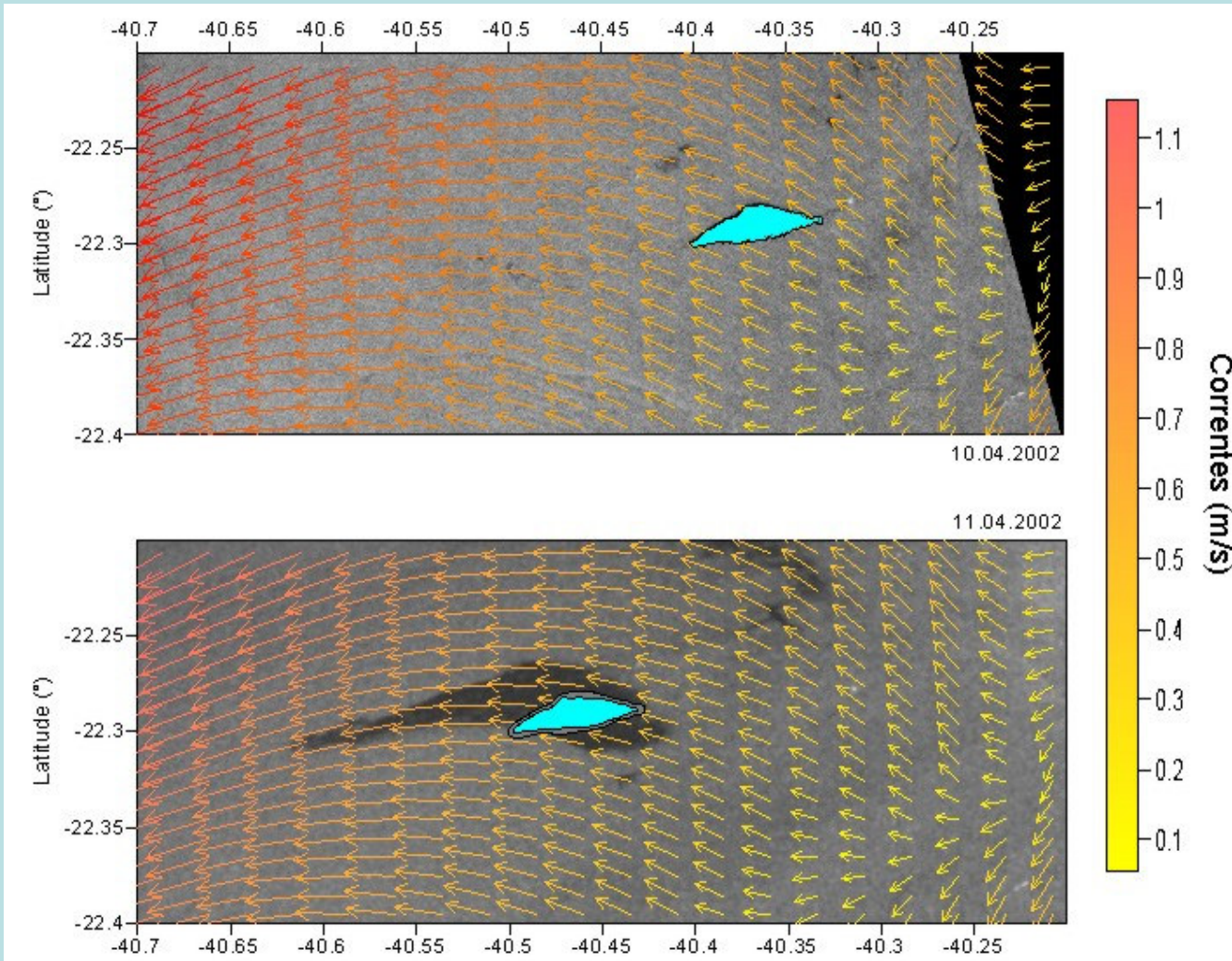# Data Integration- Atmospheric Effects
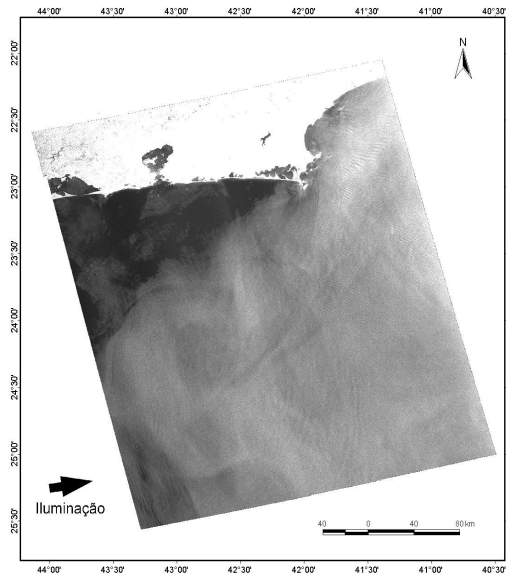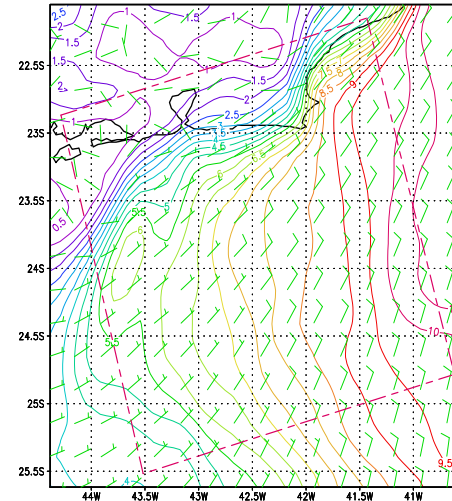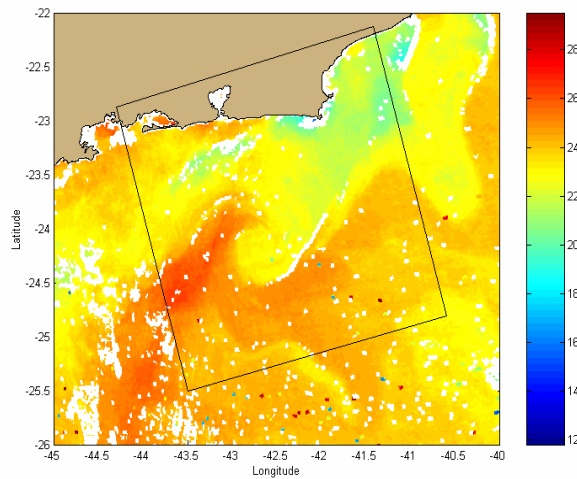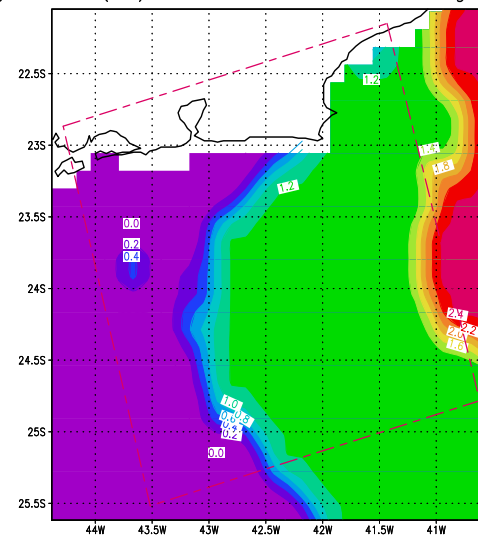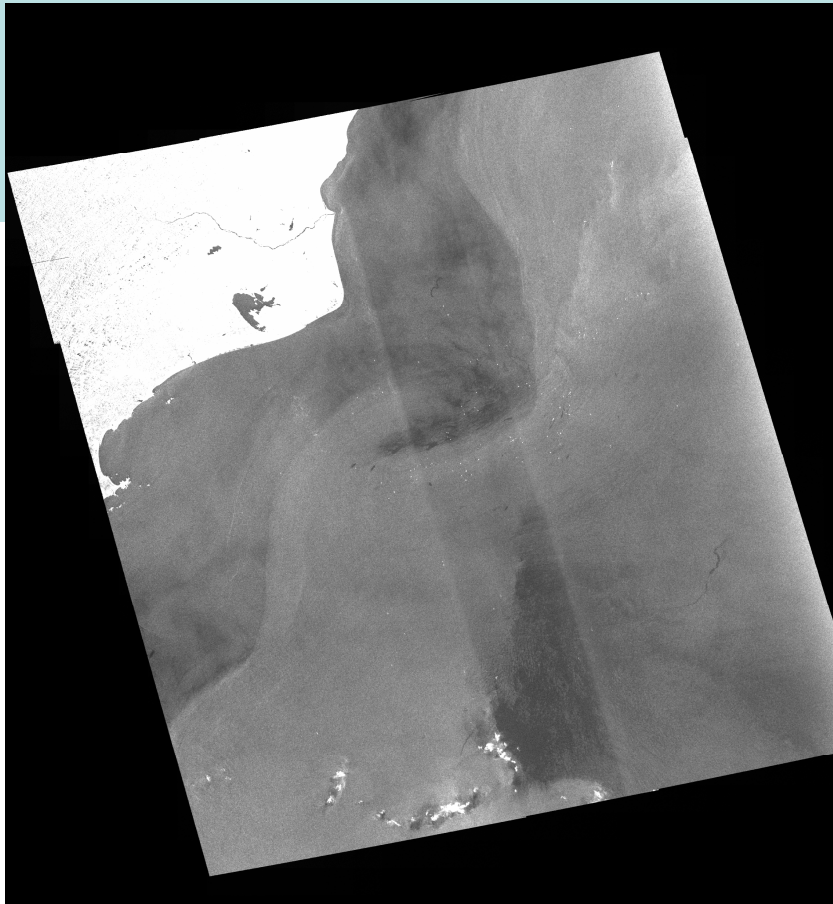
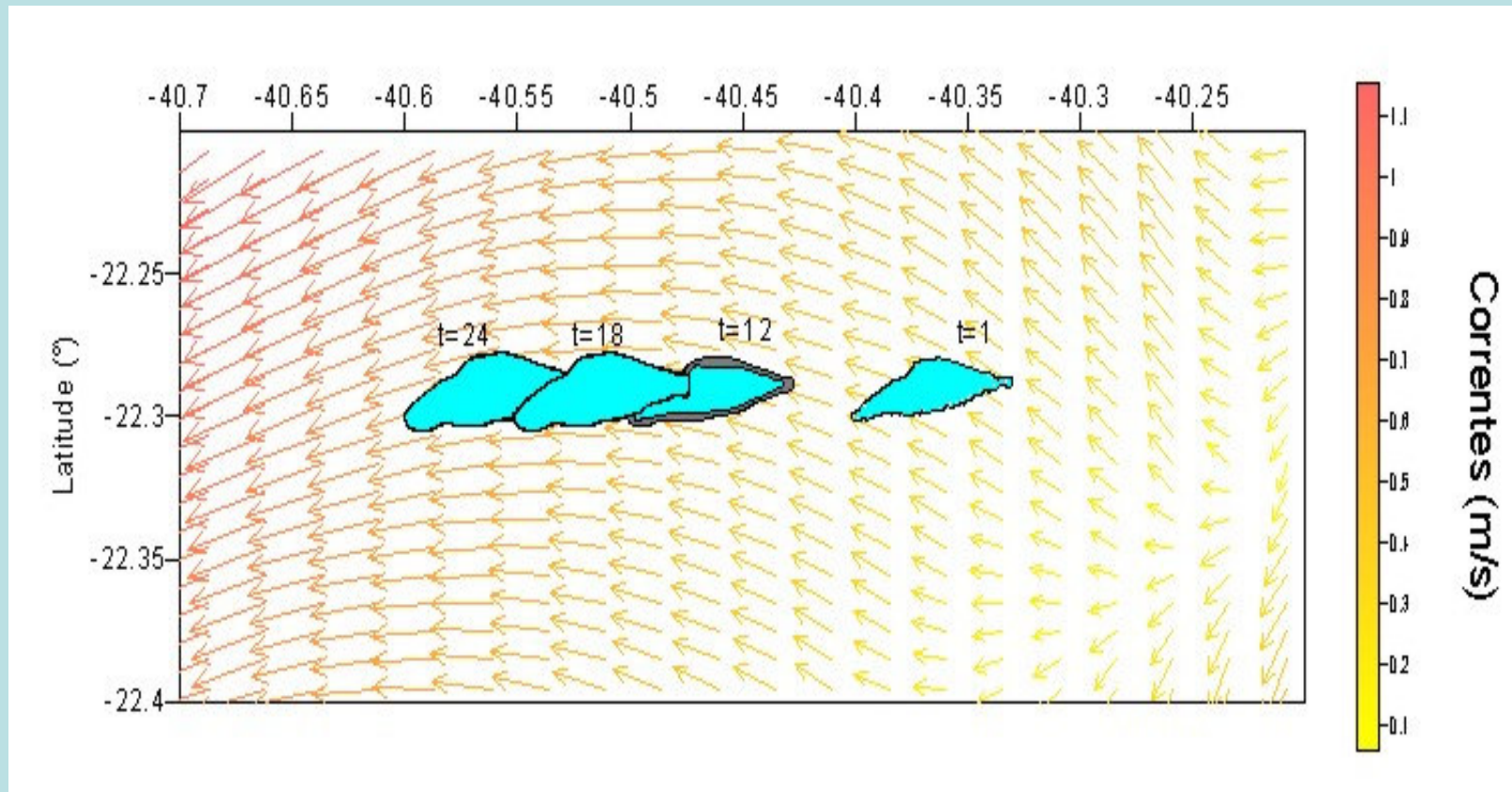## Carta de Temperatura da Superfície do Mar
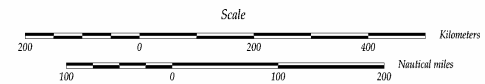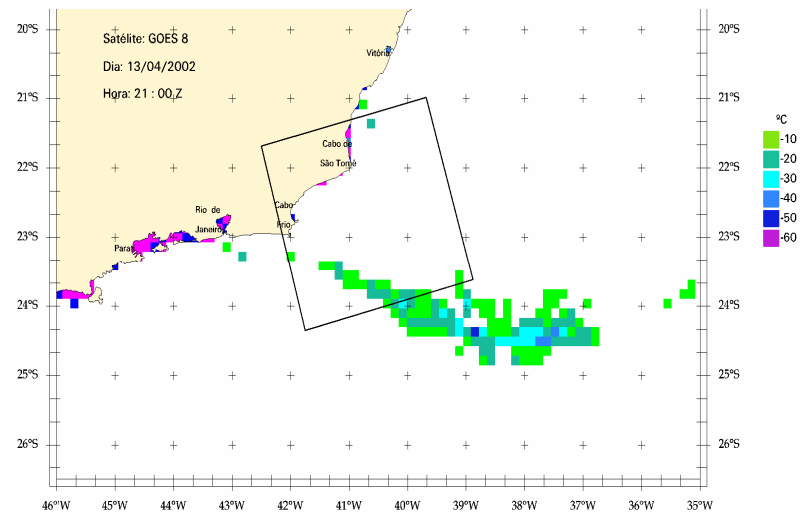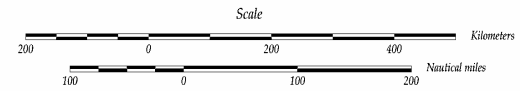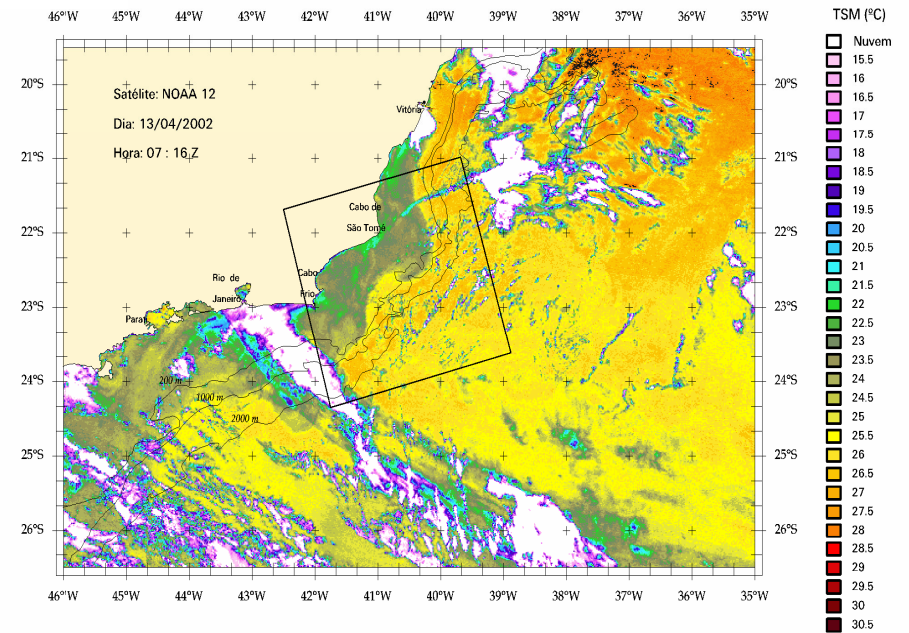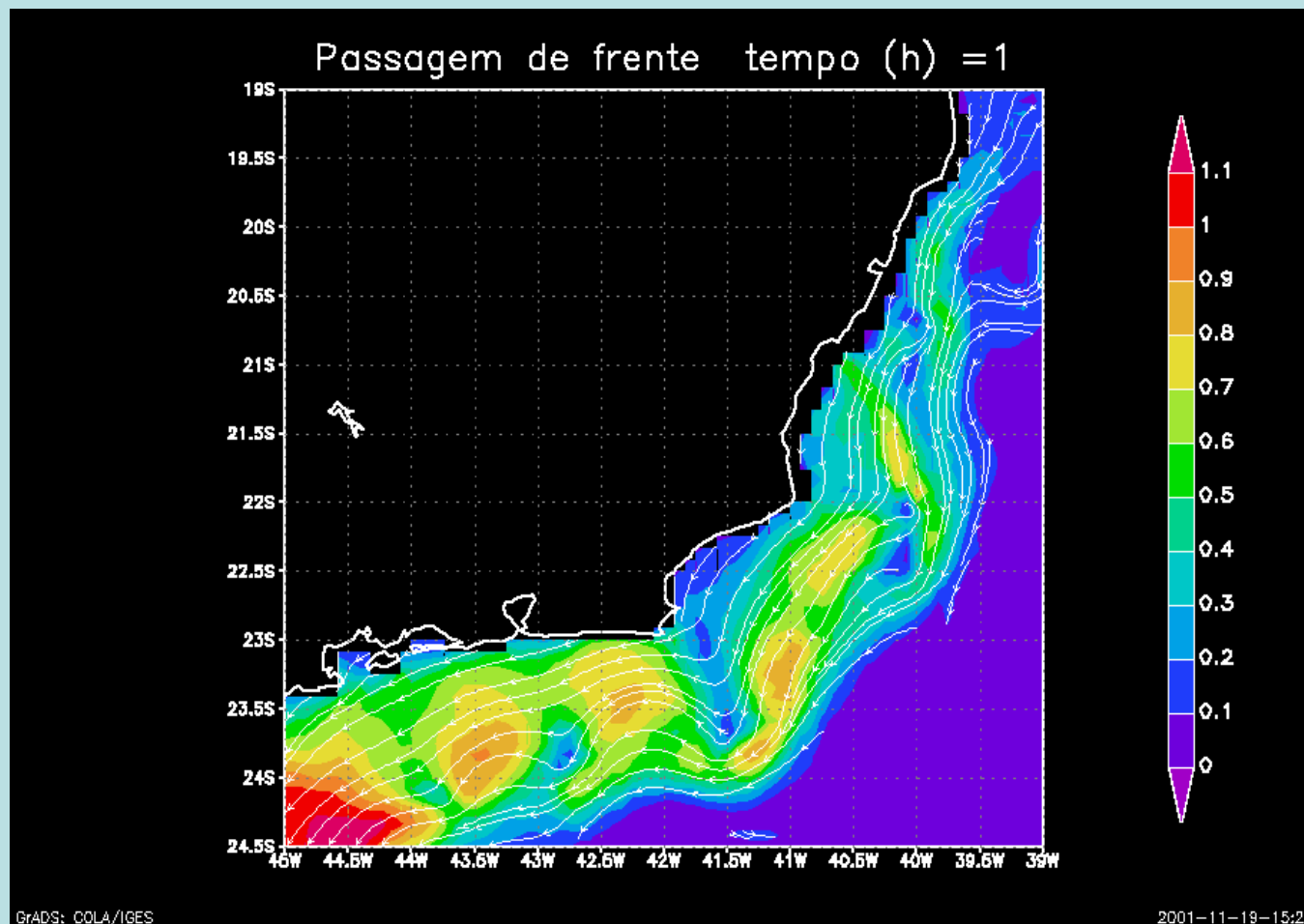
System

Oil Transport
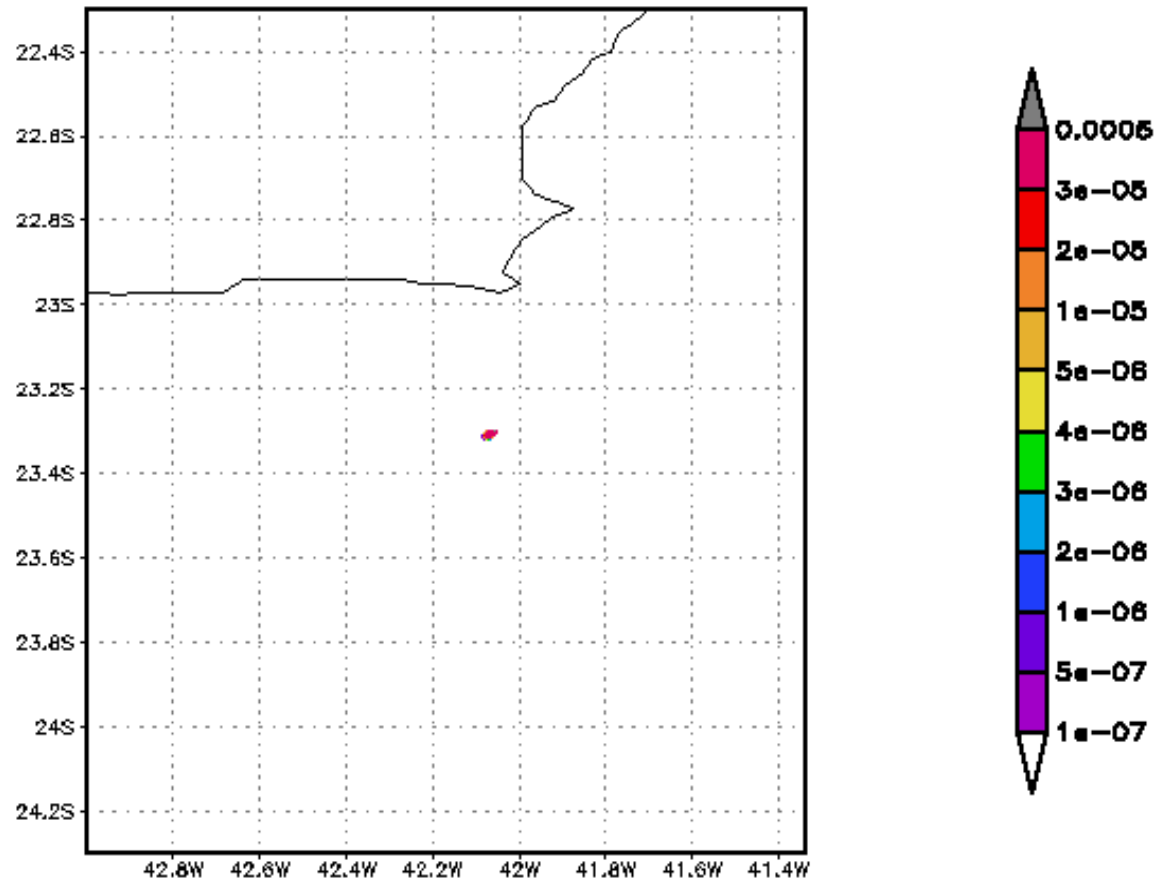
Oil Advection

Oil Advection

Hydrodynamic modelling

Oil advection Modelling

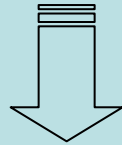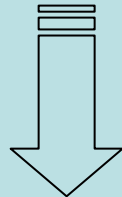CeMOM – Espessura de Oleo (m) – tempo (h) =3

GrADS: COLA/IGES

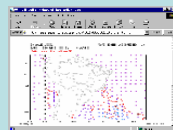# Oil Report

CeMOM

Report Time Production: ~ 1.30 hours

Transmission

INTERNET/FTP

Verification

Navy

Oil Report - Example

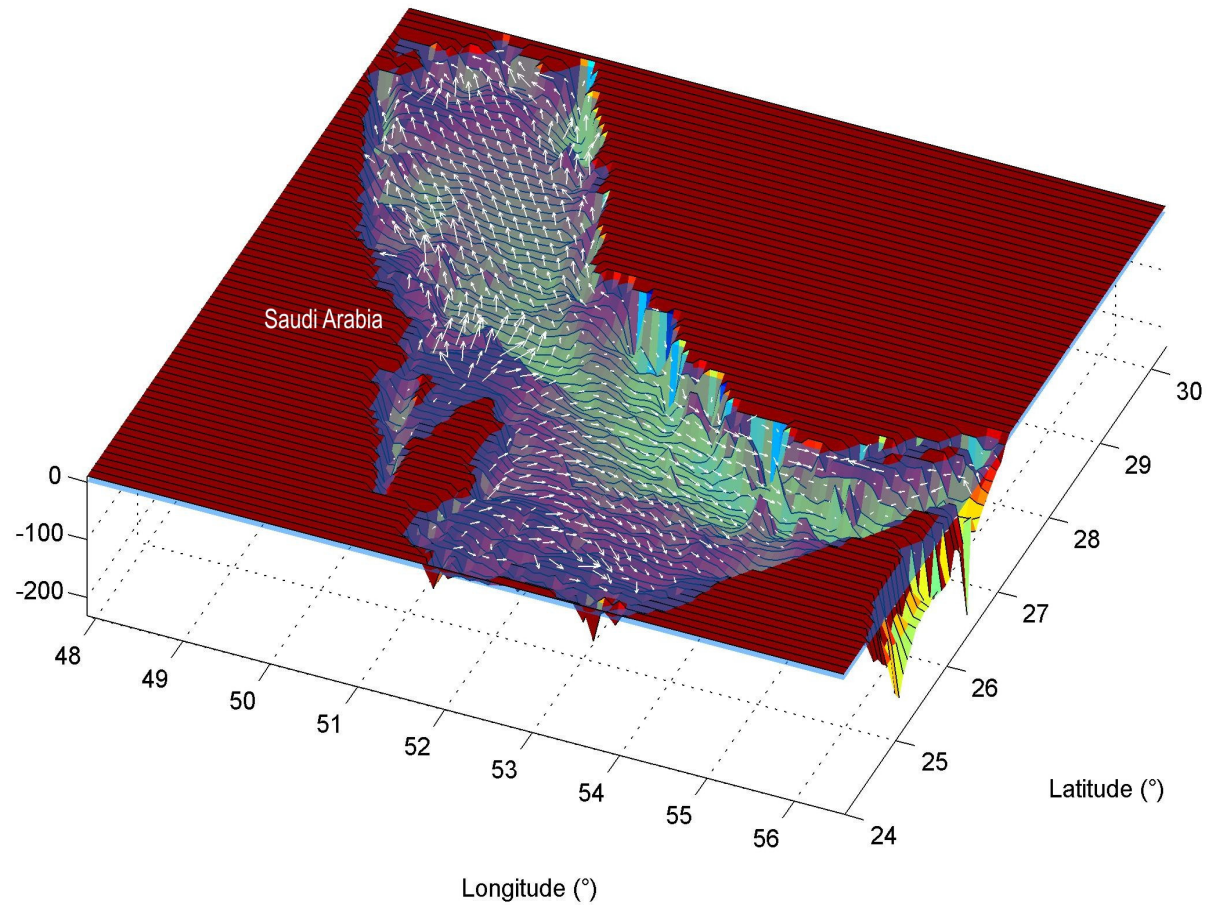- **Oil Spill verification in Campos Basin – March 20, 2003**

Oil Report - Example

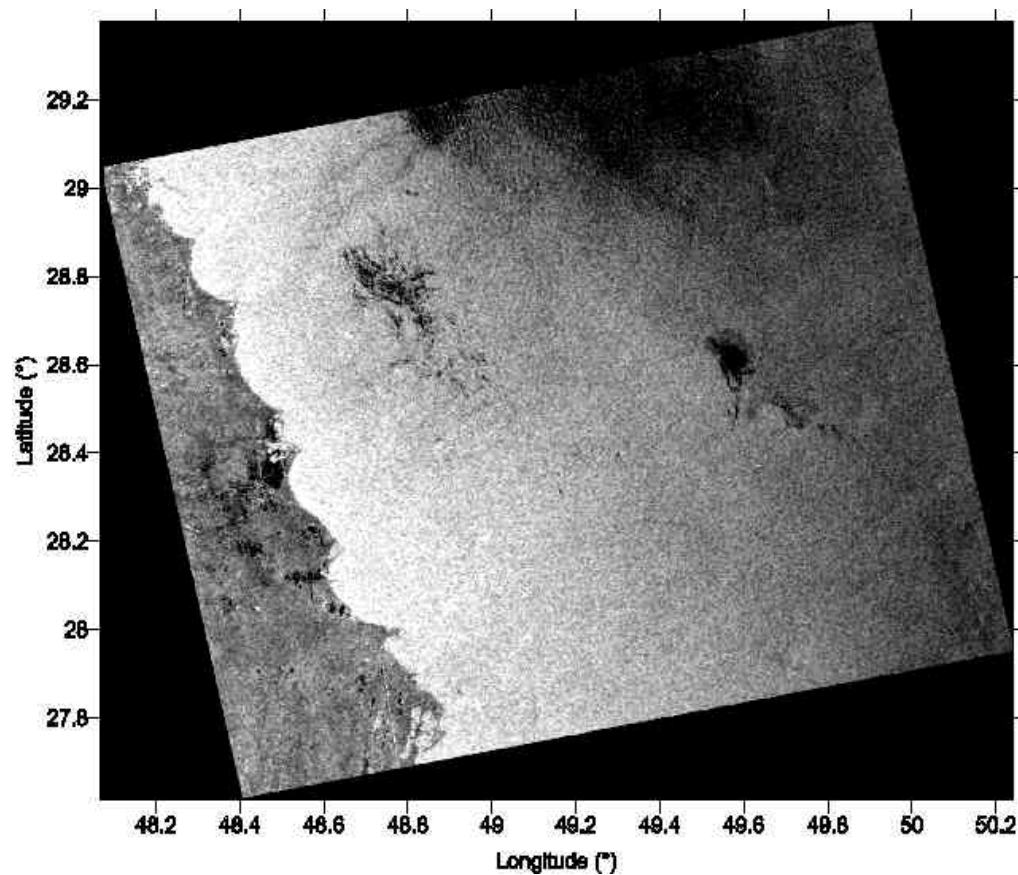- Oil Spill verification in Campos Basin – March 20, 2003

Hydrodynamic modelling

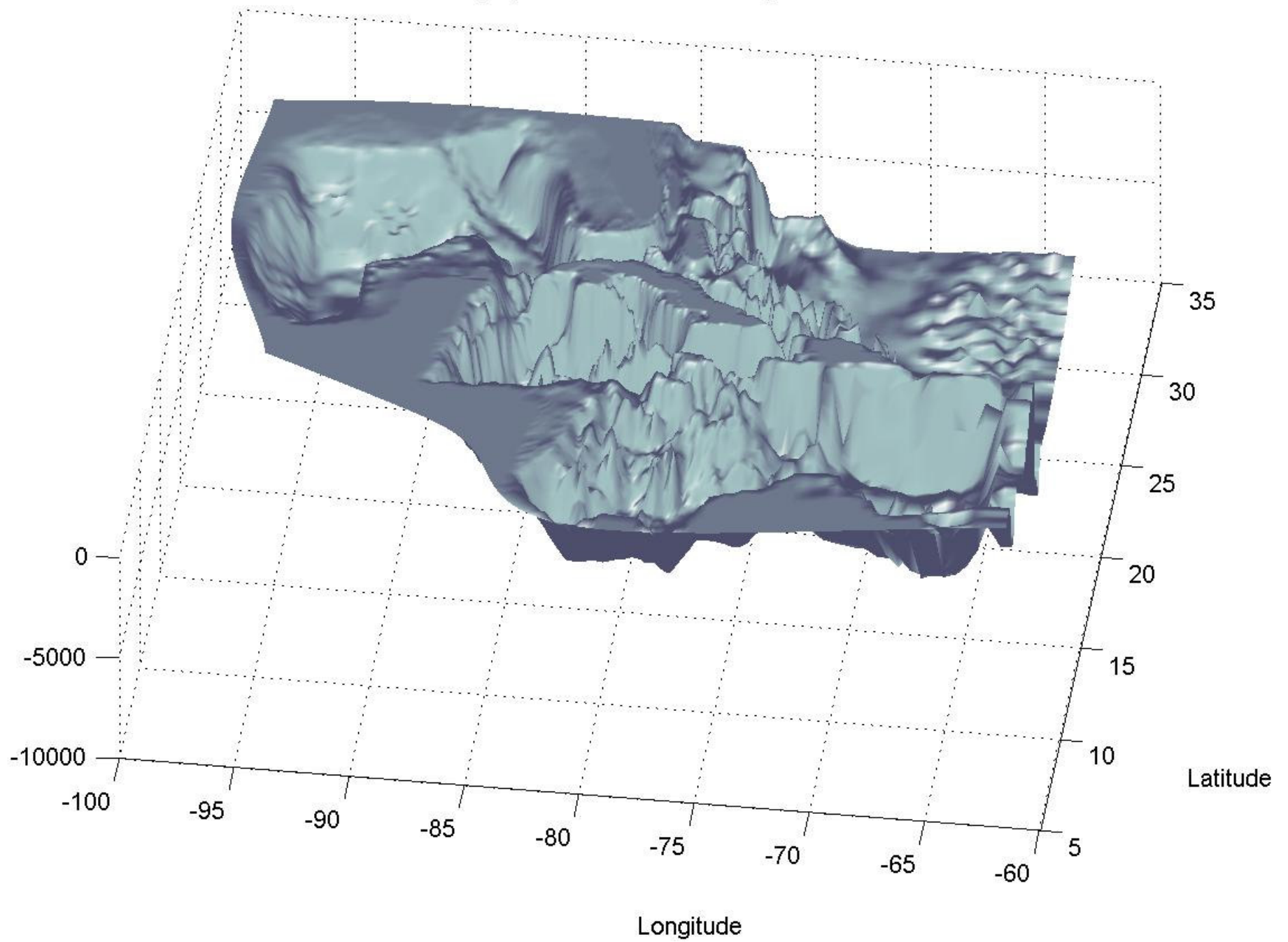Surface Current Field at 21:00 GMT - 18-Jan-1998

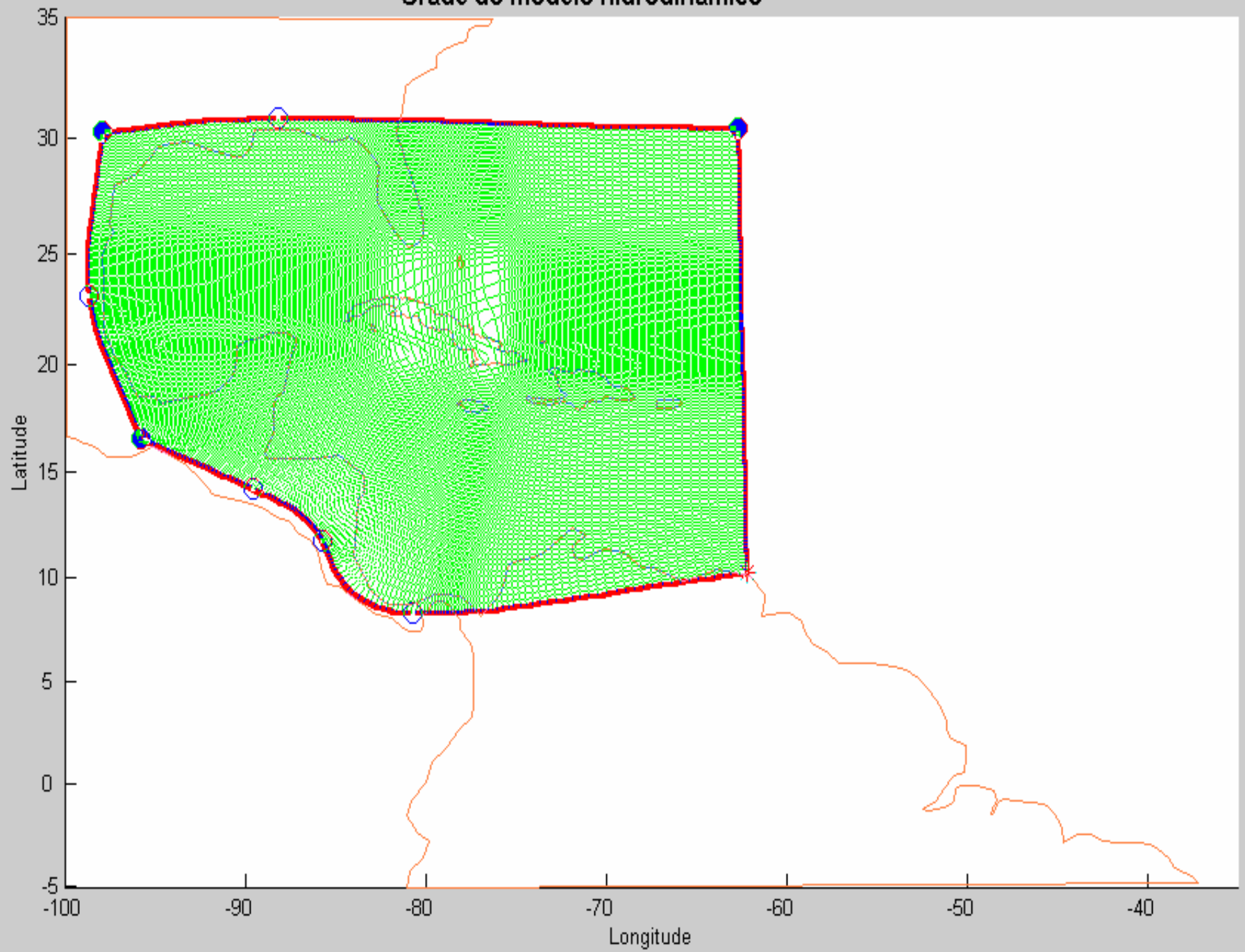# Transport modelling

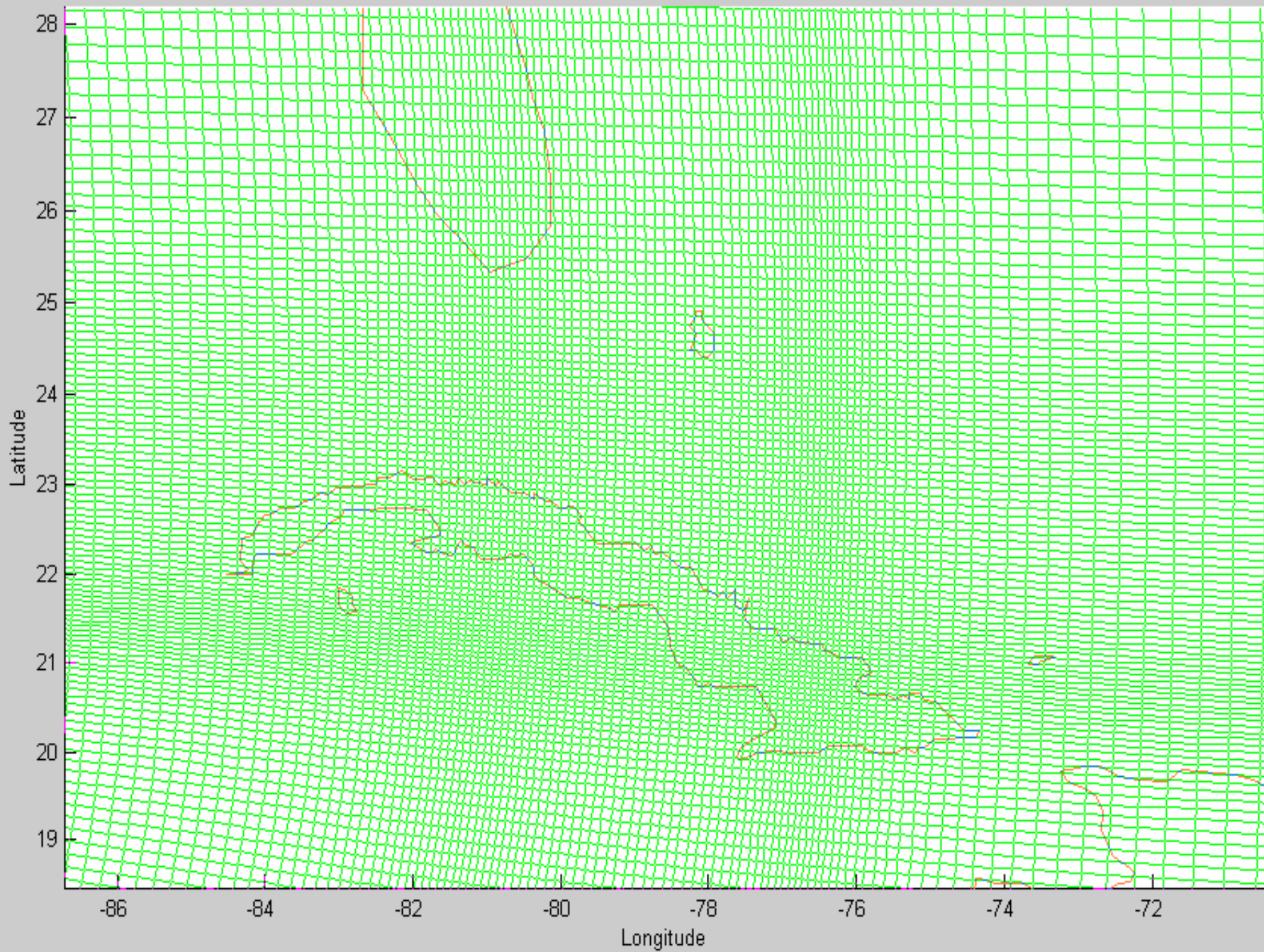## Oil Advection for 24 hours
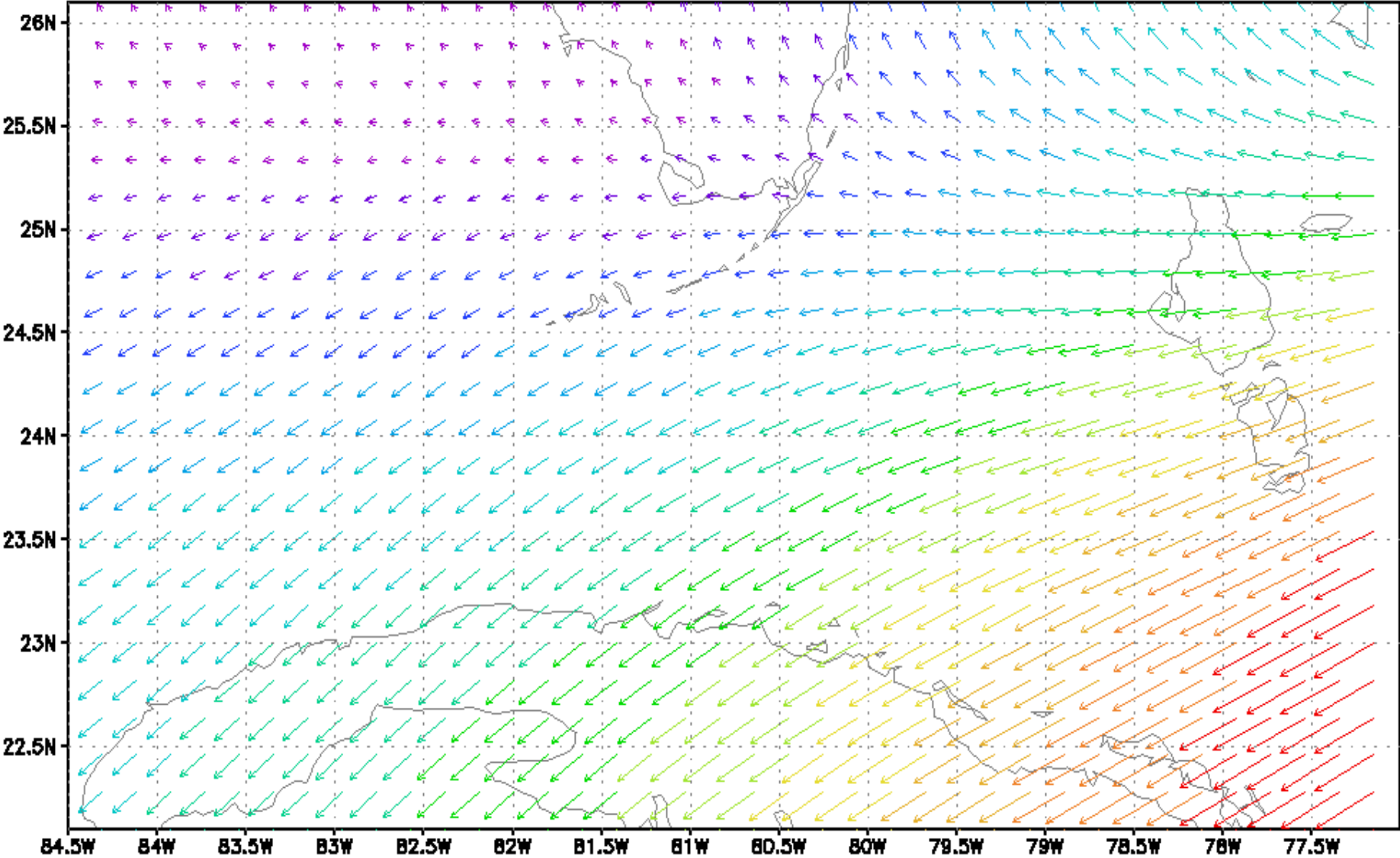
CUBA
Example

Topografia Submarina da Regiao
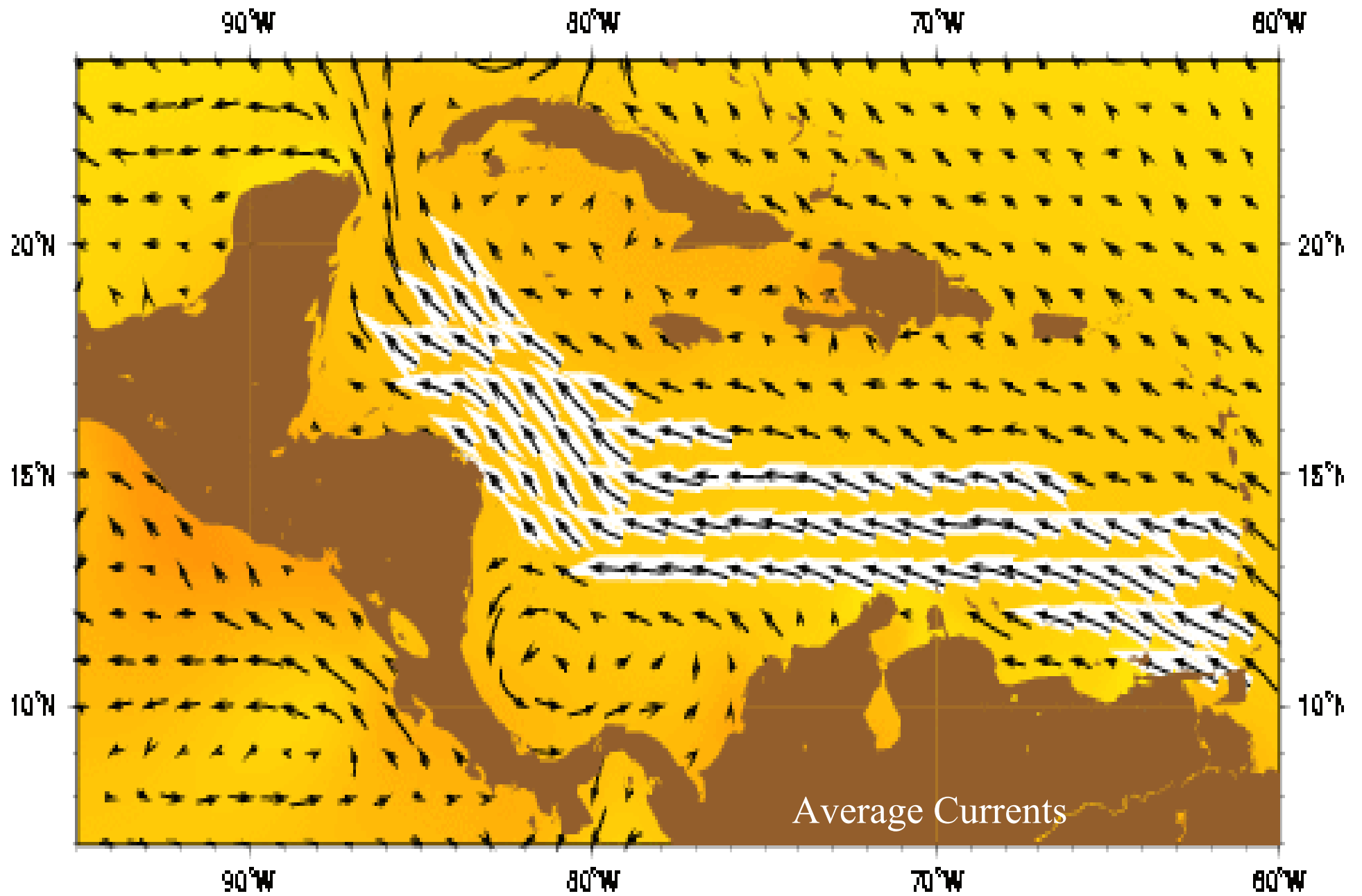
Grade do modelo hidrodinamico

Grade do modelo hidrodinamico - Detalhe

Wind at sea level (m/s)

Average Currents
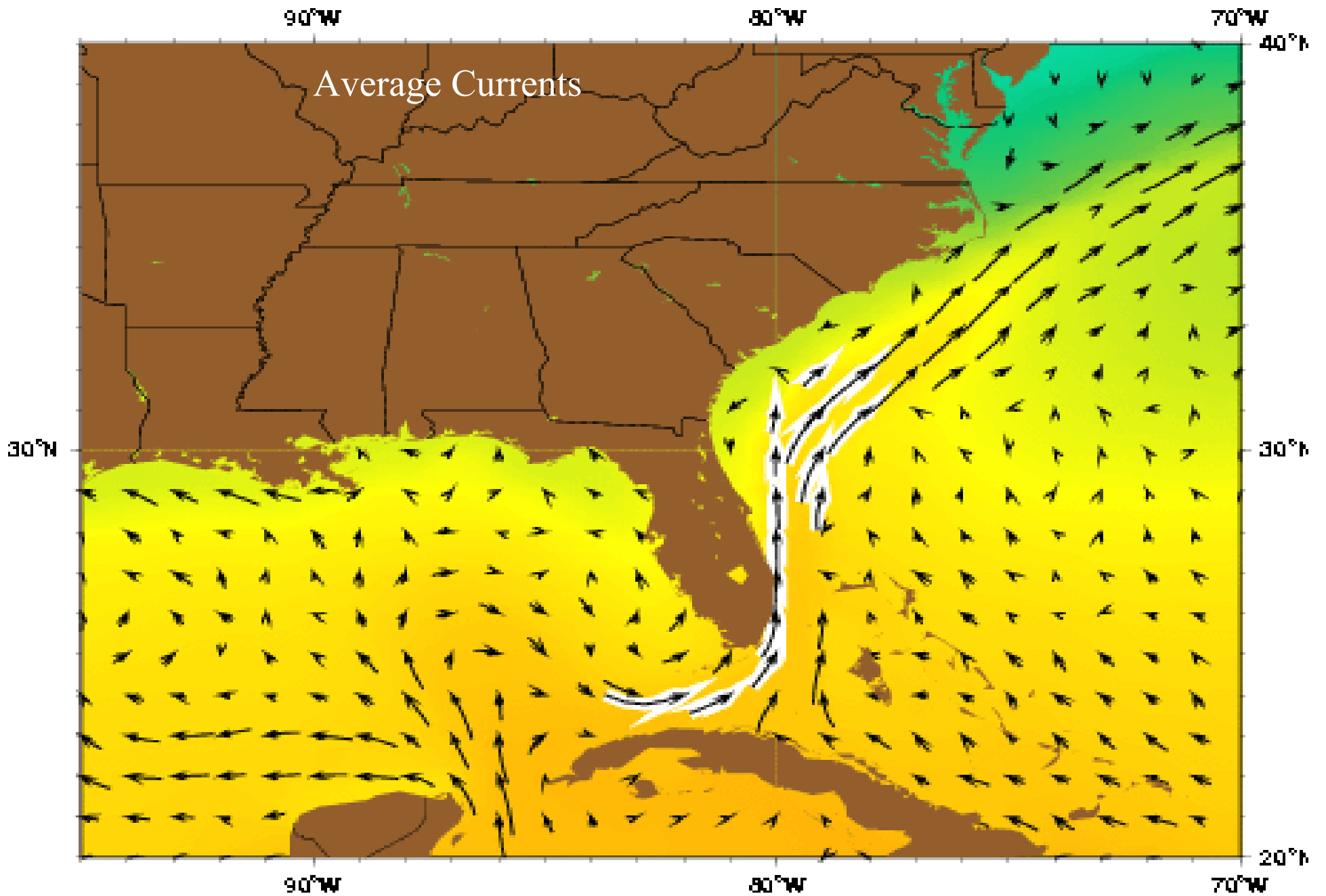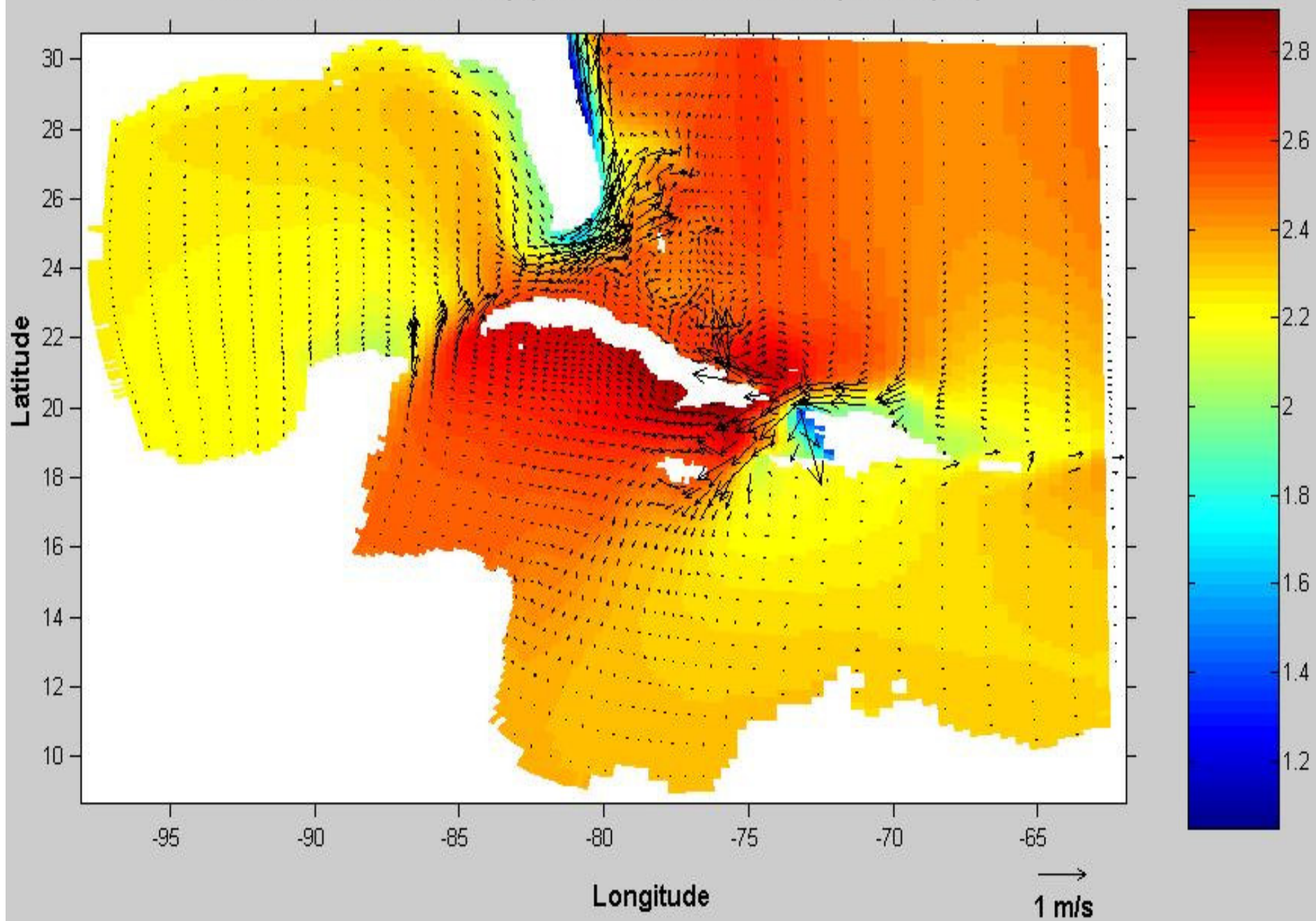
Source: RSMAS – Rosenstiel School of Marine & Atmospheric Science
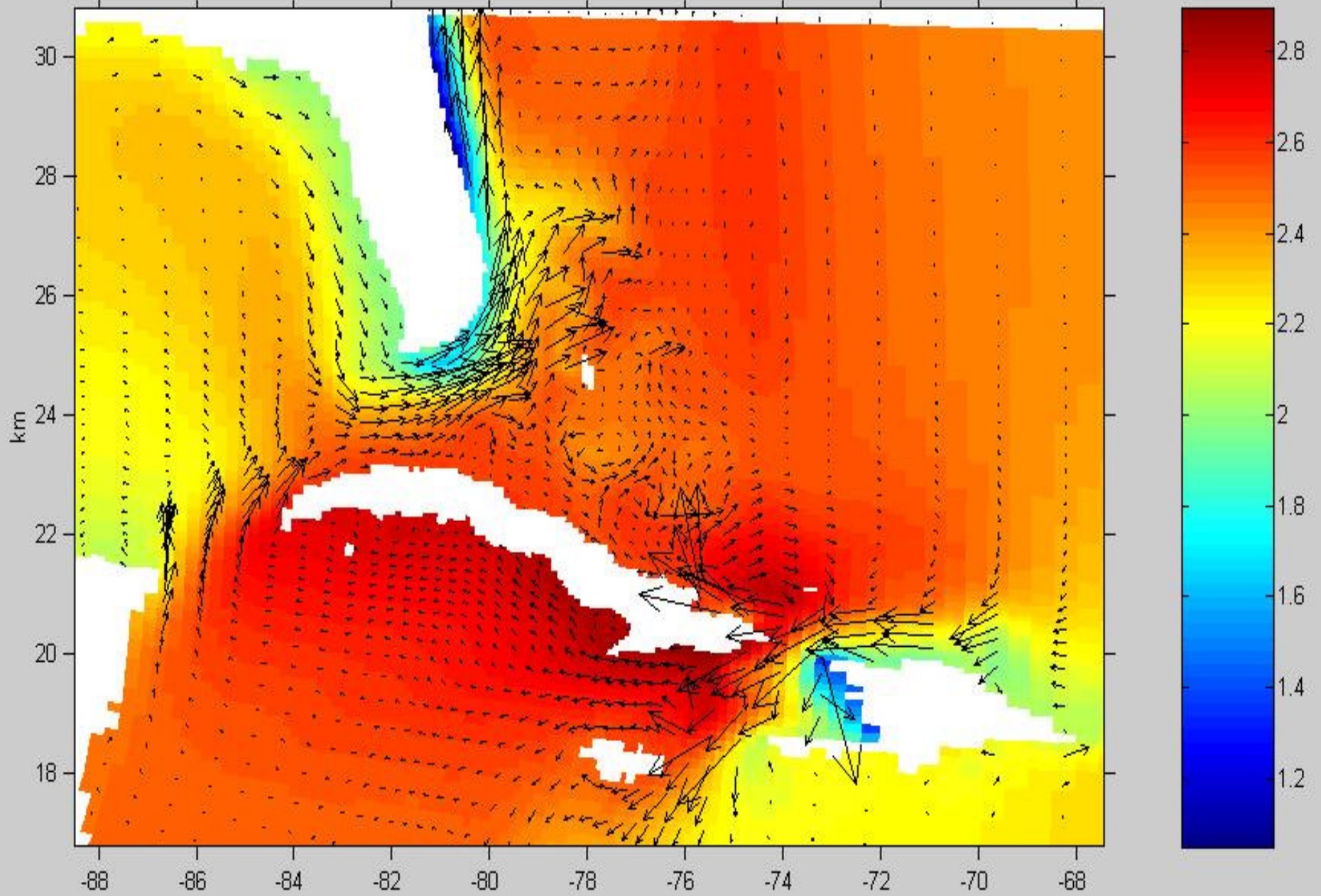
Average Currents

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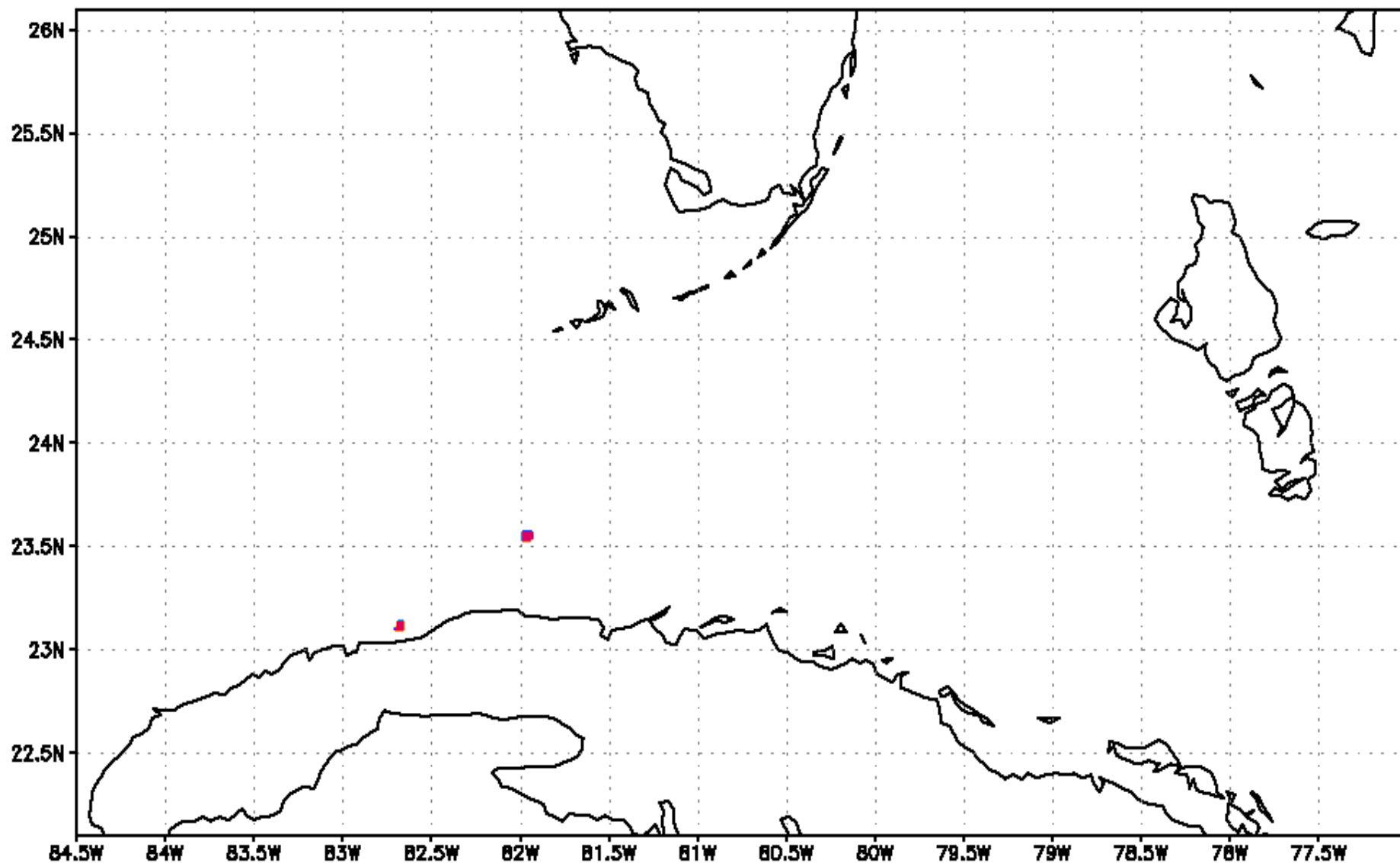
Elevacao do nivel do mar (m) e corrente marinha em superficie (m/s)

Elevacao do nivel do mar (m) e corrente em superficie (m/s) - Detalhe

Simulacion de transporte de hidrocarburo T0 +1horas

Thank you

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