

“CONAE: Missions, Projects and Initiatives for coasts and oceans”

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Ministerio de Ciencia,
Tecnología e Innovación Productiva
Presidencia de la Nación



From de Past to the Future...

SAC-C

SAC-D

SAOCOM

SABIA

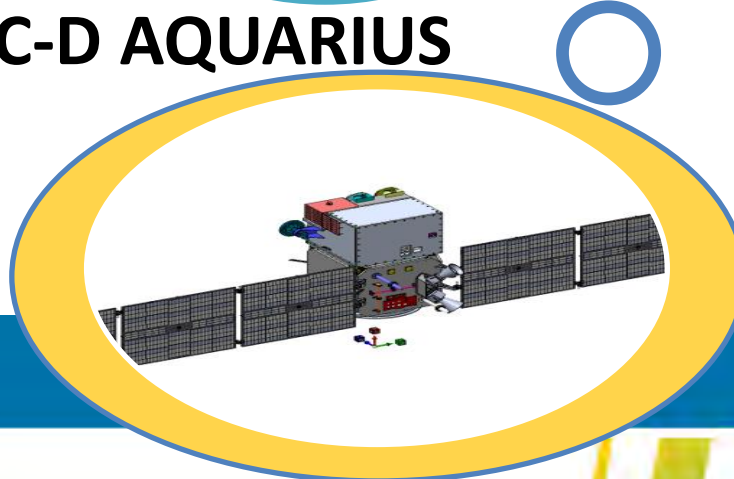
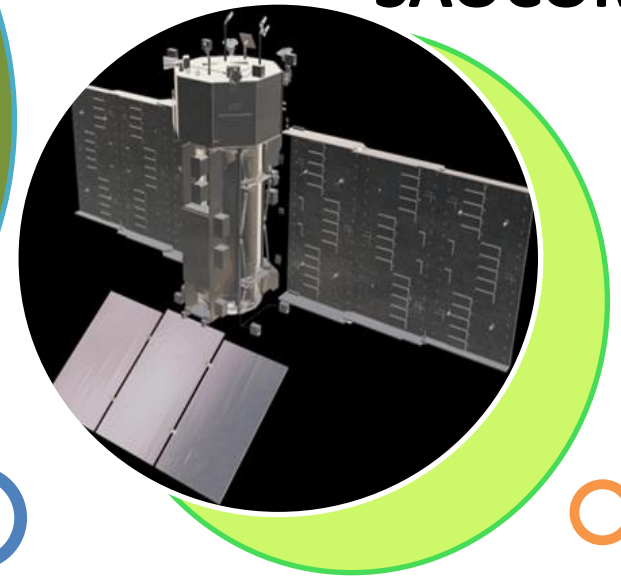
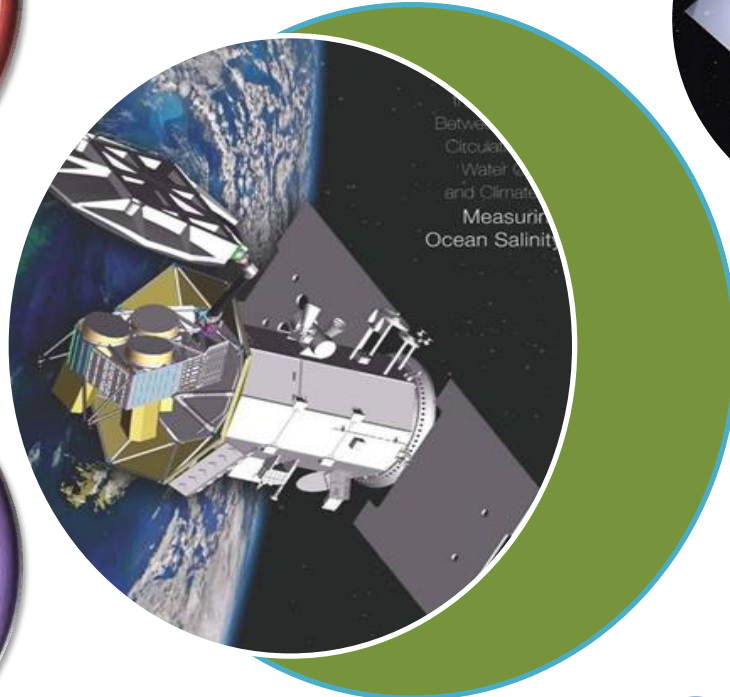
Mar

SAC-D AQUARIUS

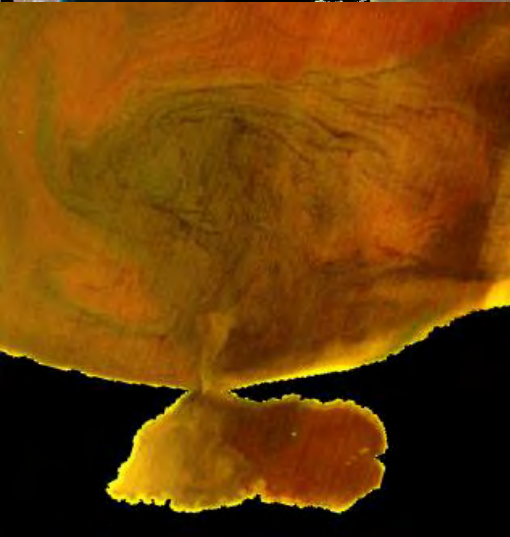
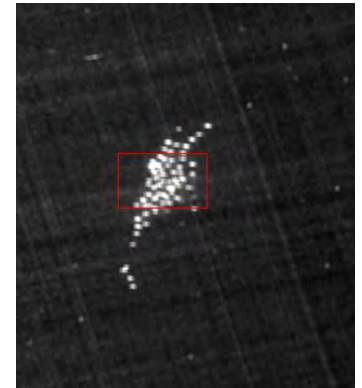
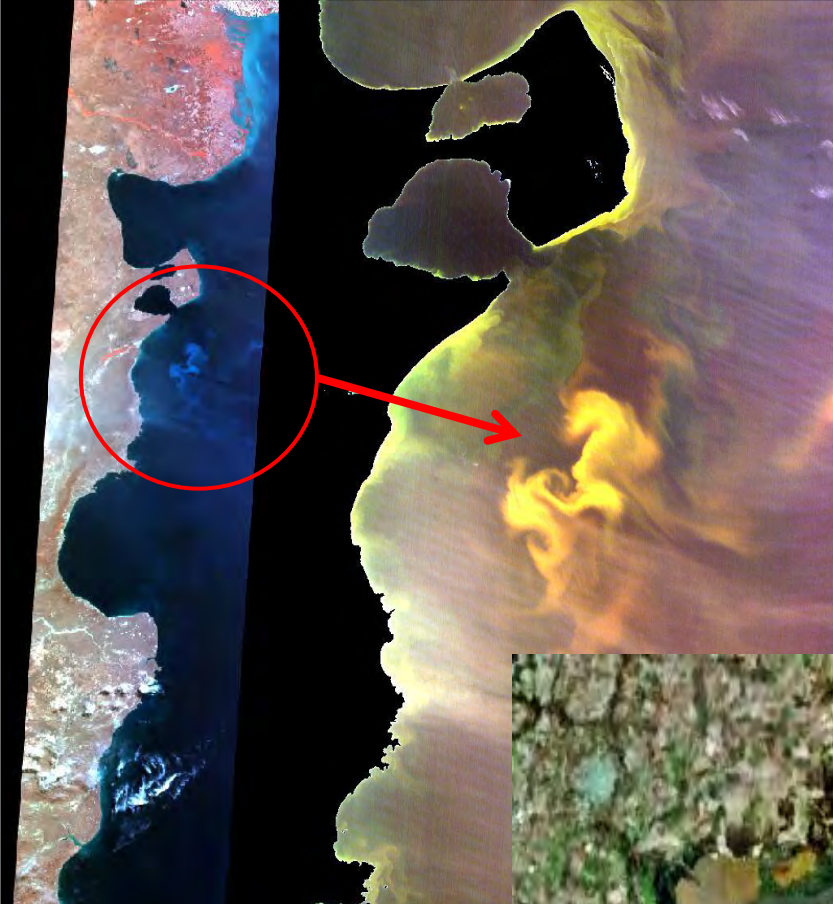
SABIAMar

SAC-C

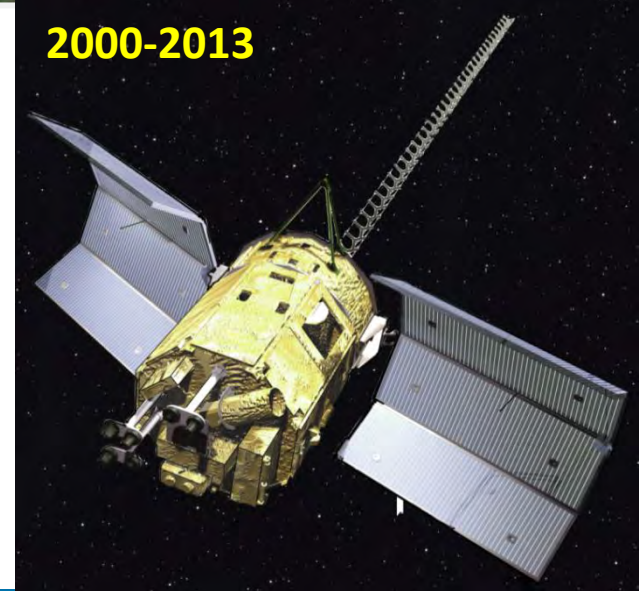
SAOCOM



SAC-C



2000-2013



Lisbon, Portugal
15-18 May 2017

SSS

Rain

Wind

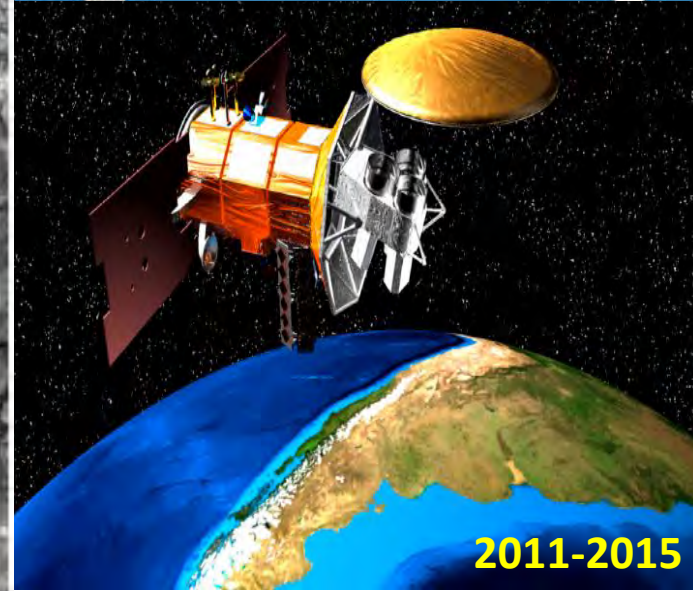
Water Vapor

Sea Ice

SST



SAC-D/Aquarius



2011-2015

An Observatory for the Ocean, Climate & Environment

Lisbon, Portugal
15-18 May 2017

SABIA-Mar Mission: Driver Objectives

❑ To measure ocean color in open ocean (Global Scenario), and South America & its coasts (Regional/Coastal Scenario), 2-day revisit, in order to provide data, information and value-added products for studies related to:

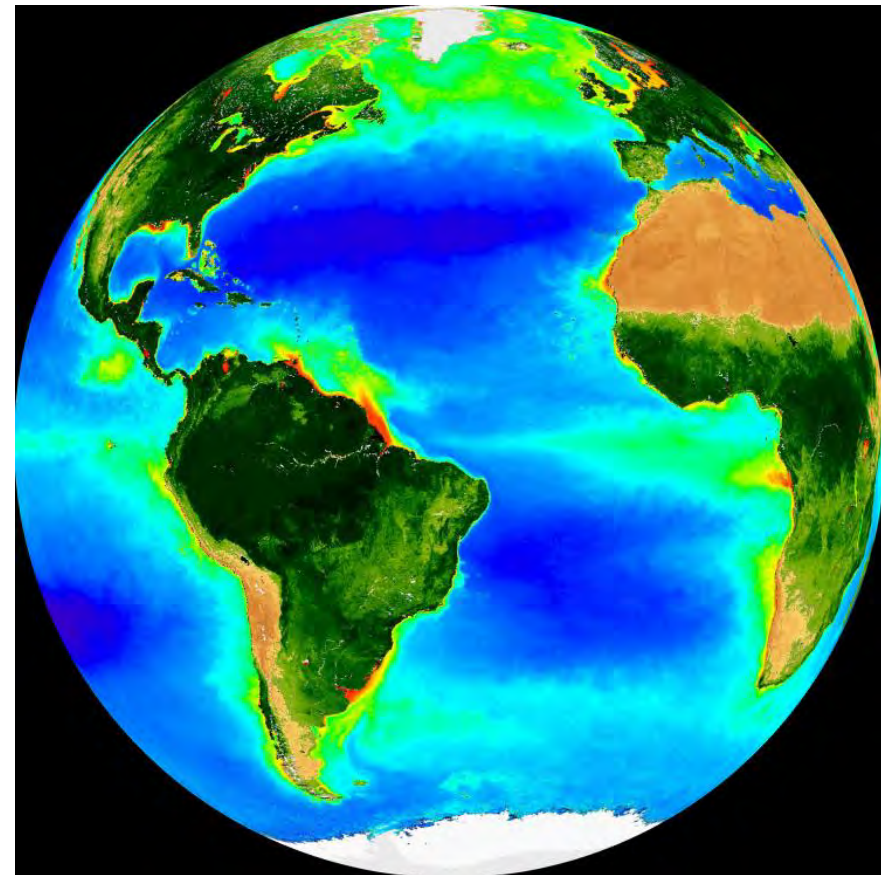
- **Primary Productivity of the Sea.**
- **Ocean and Coastal Ecosystems.**
- **Carbon Cycle.**
- **Marine Habitats and Biodiversity Assessment.**
- **Management of Fishery Resources and Water**
- **Water Quality of Coasts & Estuaries.**

❑ *And Support to Land Applications: vegetation, land use, inland waters, flooded areas.*



SABIAMar An Argentine-Brazilian Ocean Color Mission (2021)

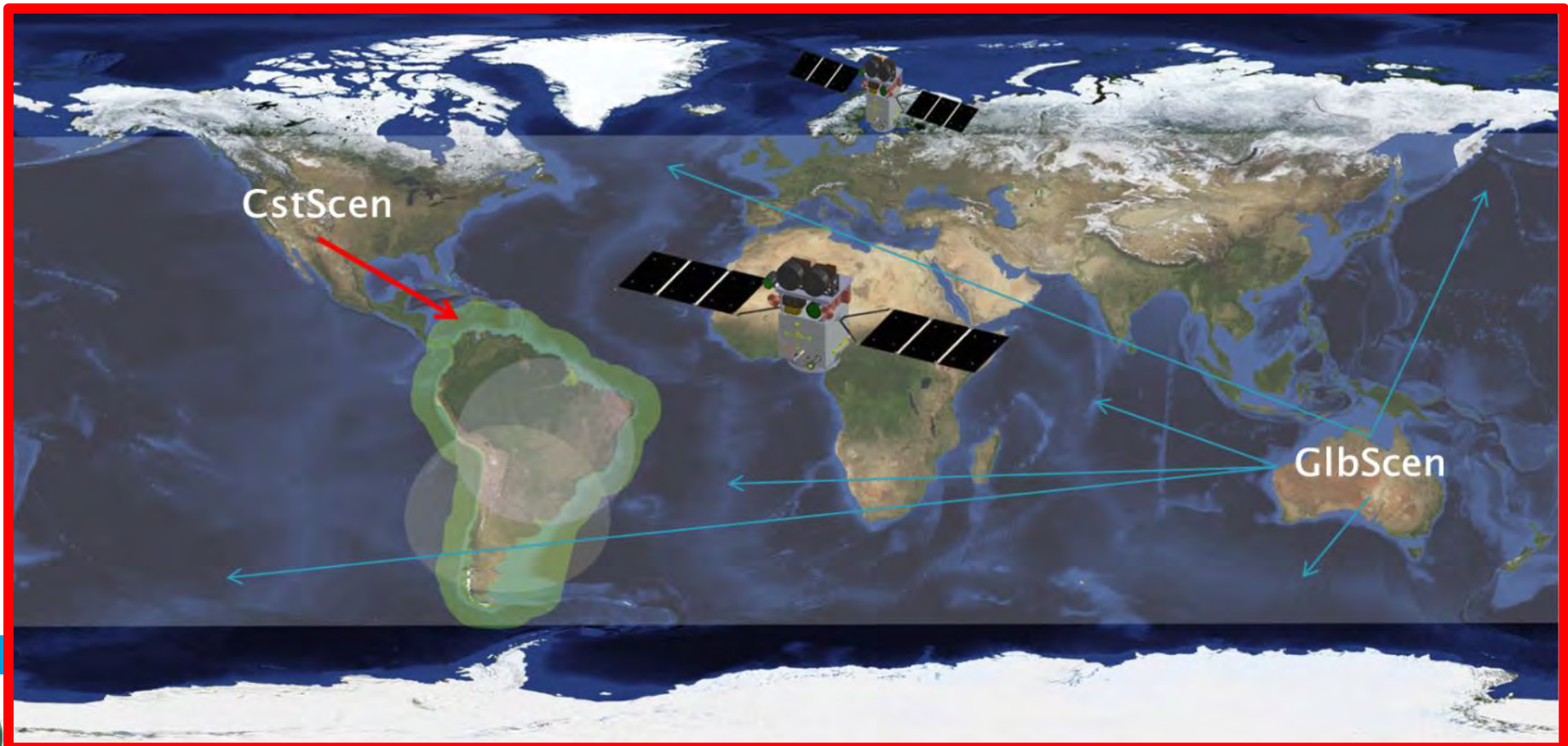
Main Data & Products:



- **Normalized Water leaving radiance**
5% uncertainty (0.5% in blue for open ocean)
- **Chlorophyll-*a* concentration**
30% uncertainty for open ocean with concentration in the range 0.01-10 mg/m³
- **Diffuse Attenuation coefficient K_d (490)**
25% uncertainty on a daily time scale
- **Photosynthetic Available Radiation (PAR)**
20%, 15%, 10% on a daily-weekly-monthly time scales
- **Turbidity**
35% uncertainty
- **Sea Surface Temperature**
0.7°C (accuracy for 400 m gsd)

Mission Scenarios

- ❑ Global: system designed to cover 120° in latitude
2-day revisit. Spatial resolution: 800m
- ❑ Regional (Coastal & Land): system designed to cover South America (land) and its coastal regions. **2-day revisit. 200m**



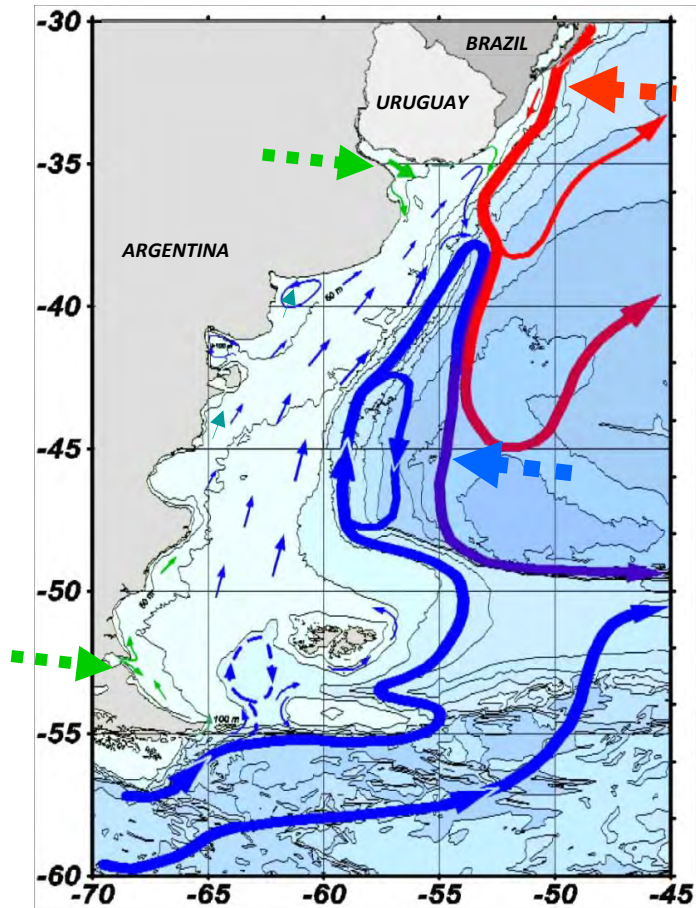
Bands – Ocean Color & SST

Visible & NIR Bands	Wave length (nm)	Bandwidth (nm)	GSD (m) Regional/Global	NIR-SWIR Bands	Wave length (nm)	Bandwidth (nm)	GSD (m) Regional
B0	412	10	200/800	B9*	750	10	400
B1	443	10	200/800	B10	765	10	400
B2	490	10	200/800	B11*	865	20	400
B3	510	10	200/800	B12	1044	20	400
B4	555	10	200/800	B13	1240	20	400
B5	620	10	200/800	B14	1640	60	400
B6	665	10	200/800	TIR Bands	Wave length (nm)	Bandwidth (nm)	Spatial Resolution (m)
B7	680	7.5	200/800	B15	10800	900	400
B8	710	10	200/800	B16	11800	900	400
B9*	750	10	200/800				
B11*	865	20	200/800				

Visible & NIR Bands for Ocean Color Parameters
 SWIR Bands for Atmospheric Corrections (specially Turbid Waters)
 TIR Bands for SST

Motivations for this Ocean Colour Mission....

Dynamic of the Argentinean Sea

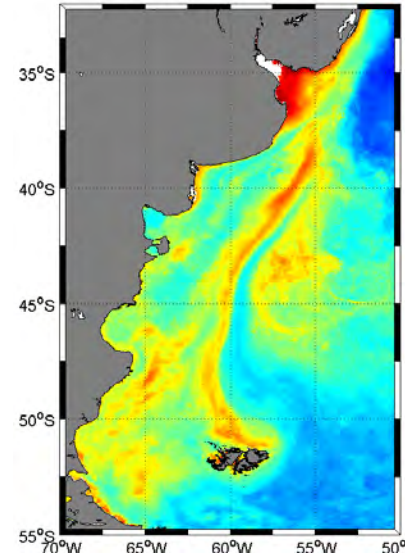


The most important oceanographic forcing's are discharges of fresh water (La Plata River, Strait of Magellan and minor tributaries) and currents of Brazil and Malvinas. The first warm, hypersaline and oligotrophic waters and the cold water, low salinity and nutrient-rich (Malvinas).

Chlorophyll -a

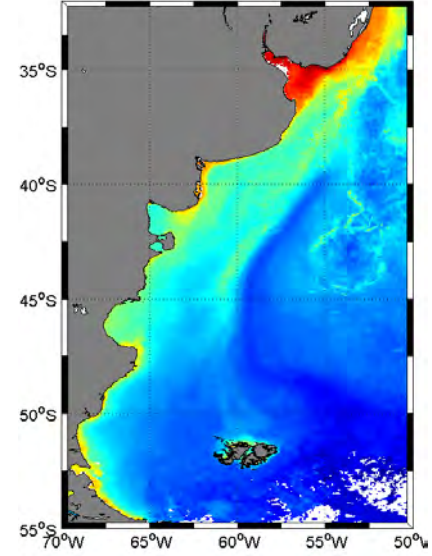
Summer

MODIS 1/2003-2009 (001-031) 4km



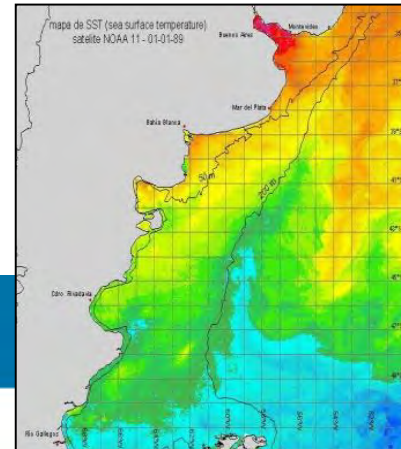
Winter

MODIS 8/2002-2009 (213-243) 4km

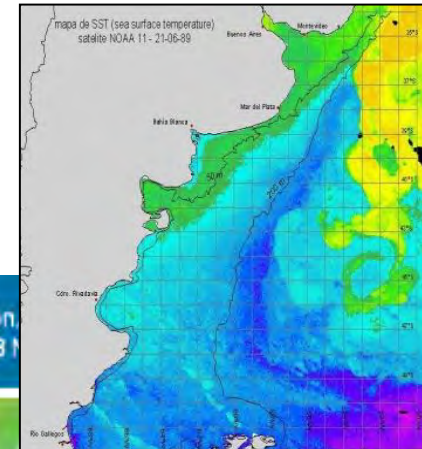


Temperature

Summer



Winter



Motivations.....

In a National Framework this Mission is according to:

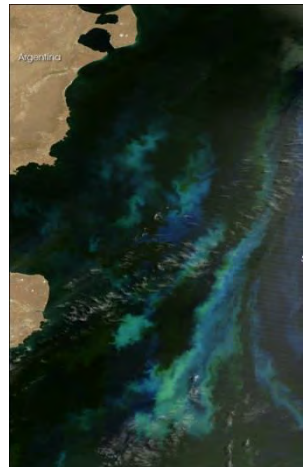
1) Space National Plan:

a) Data & Information for these Benefit Areas:

- ❖ Climate, Ocean, Seas, Coasts, Hidrology
- ❖ Productive Activities (as Fishery)
- ❖ Natural & Anthropogenic Emergencies
- ❖ Public Health
- ❖ Surveillance & Safety
- ❖ Natural Resources Management

b) Capacity building:

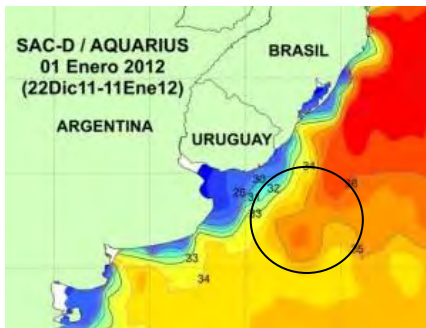
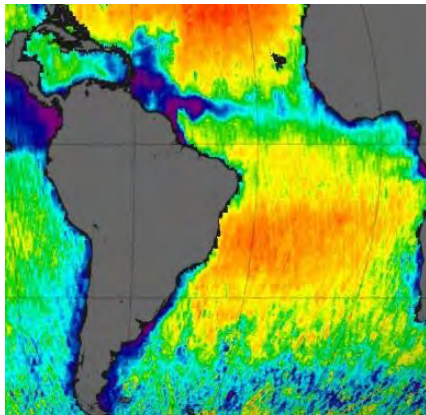
- ❖ 2Mp Educational Programme
- ❖ Posgraduate Studies (Masters: Applications
Instruments, Software & Spatial Technology)



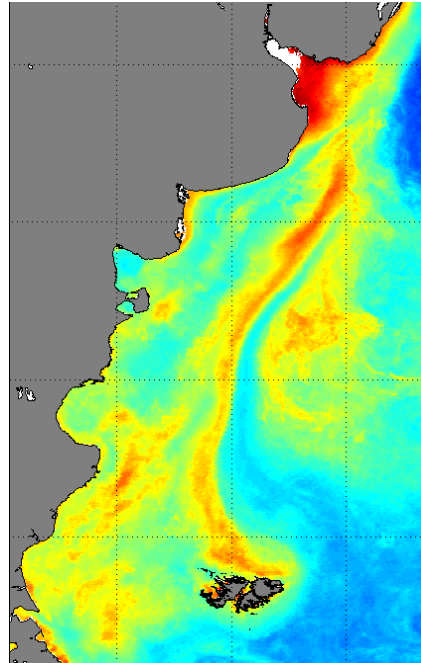
Motivations.....

2) Continuity for SAC-D Aquarius Research Communities related to Ocean

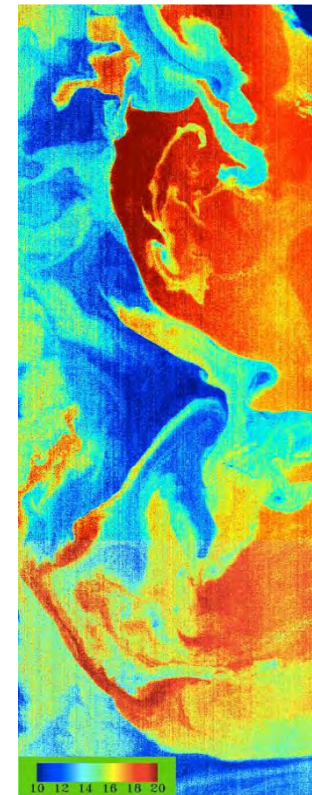
Salinity



Ocean color



SST

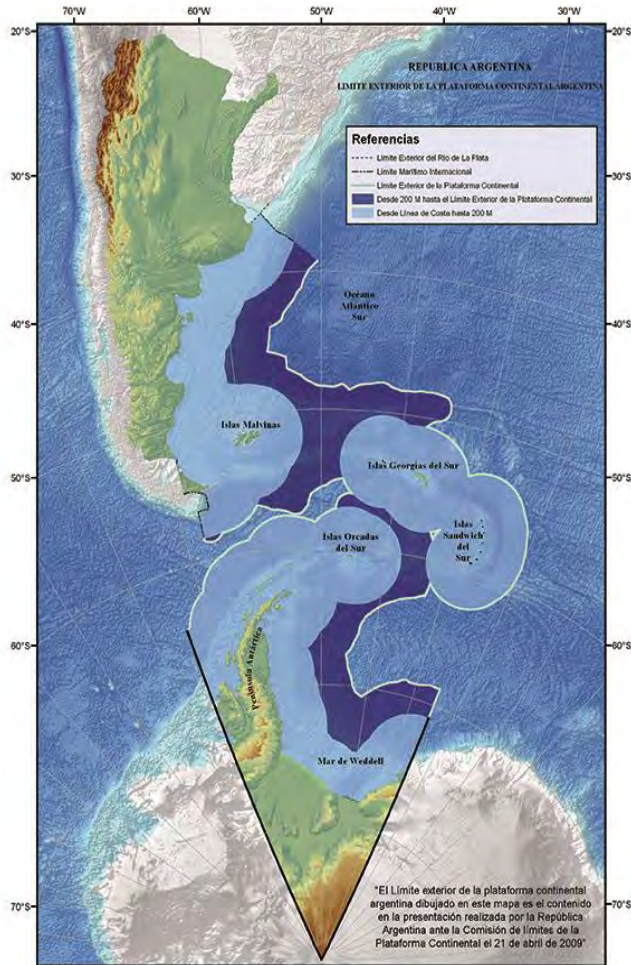


DCS



Motivations....

3) Extension of External Boundary of Platform (COPLA)

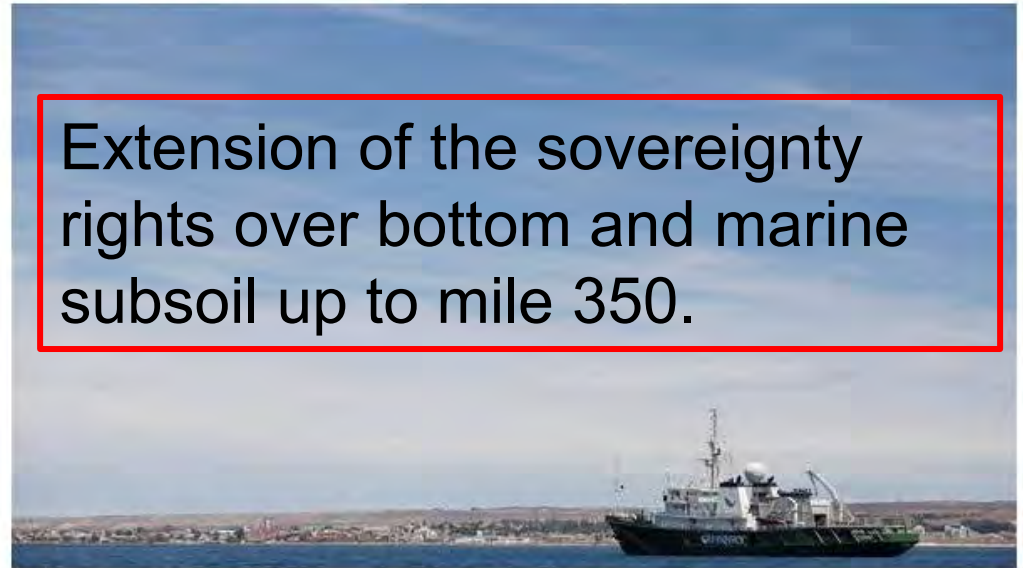


Clarín.com > Política > 27/03/16

Por un fallo de la ONU, Argentina agranda 35% su plataforma marítima

Soberanía nacional El Comité especializado en derechos del mar aceptó un reclamo de 2009. Se ganan 1,7 millón de kilómetros cuadrados.

Extension of the sovereignty rights over bottom and marine subsoil up to mile 350.

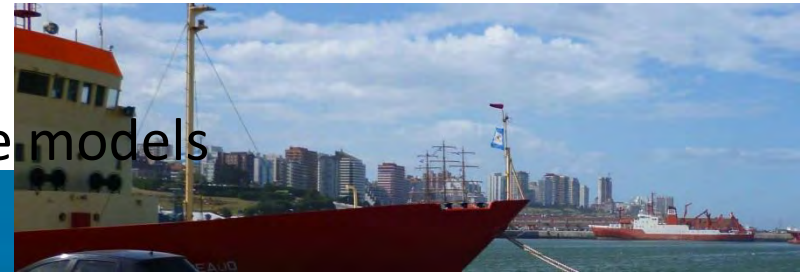


Motivations.....4) PAMPA AZUL INICIATIVE

❖ The initiative promotes technological innovations applicable to the sustainable exploitation of natural resources and the development of industries related to the sea, strengthening Argentina maritime conscious, supporting with data and scientific presence our sovereignty in the South Atlantic. **PROMAR LAW (#27.167)**

Main research areas of Pampa Azul

- Physical and biological oceanography
- Preservation and management of biodiversity
- Monitoring of fishery resources
- Climate change and impacts on biodiversity and fisheries
- Marine geology and mineral resources prospecting
- Integrated coastal management and marine spatial planning
- Creation of marine protected areas
- Development of databases and predictive models



Priority Areas

1. Burdwood Bank
2. Continental Shelf ("Blue Hole")
3. San Jorge Gulf
4. Patagonian and Rio de la Plata Estuaries
5. Sub Antarctic Islands



Research Vessels

- Puerto Deseado (CONICET)
- Austral (CONICET)
- Azara I (Fundación Azara)
- Dr. E. Holmberg (INIDEP)
- Capitán Oca Balda (INIDEP)
- Dr. B. Houssay (PNA)
- SB15-Tango (PNA)
- Almirante Irizar (INA)
- Comodoro Rivadavia (SHN)



Institutional Infrastructures



Motivations.....

In an International Framework this Mission is according to:

1) Climate Change



Paris Climate Change Conference - November 2015



And also SABIA-Mar will provide support for the National Level Contributions related to Climate Change

2) International Ocean Color Community

Collaboration with:

Regional: Brasil/INPE

International: IOCCG (International Ocean-Color Coordinating Group)/CEOS

NASA

NOAA

ESA

SABIA-Mar

Main Users

- Ocean Color Community (National & International)
- Public Institutions (Fishery & Surveillance)
- Universities & Academy

Data Access

- Data & Products from the web (open data)
- Standard formats
- Special Acquisitions (out of regional scenario)

Public Outreach

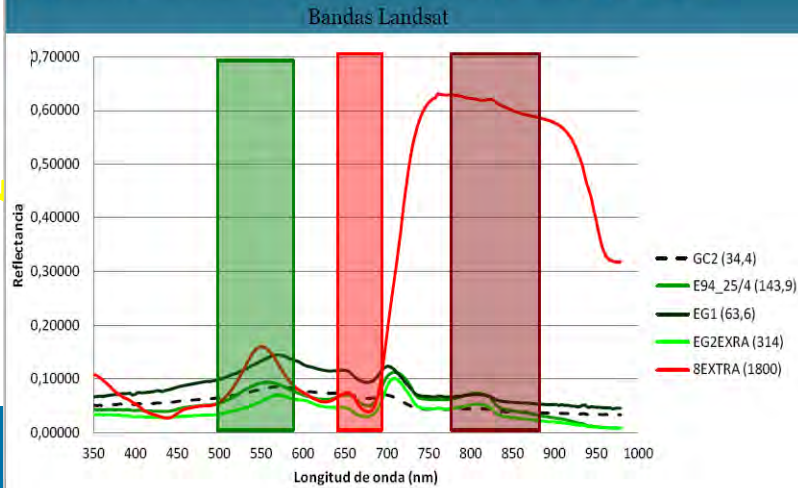
- Web Site & Webinar
- 2Mp Educational Programme Connection
- Announcements of Opportunity
- Activities for general public

In situ radiometric measurements in progress

With National & International Cooperation

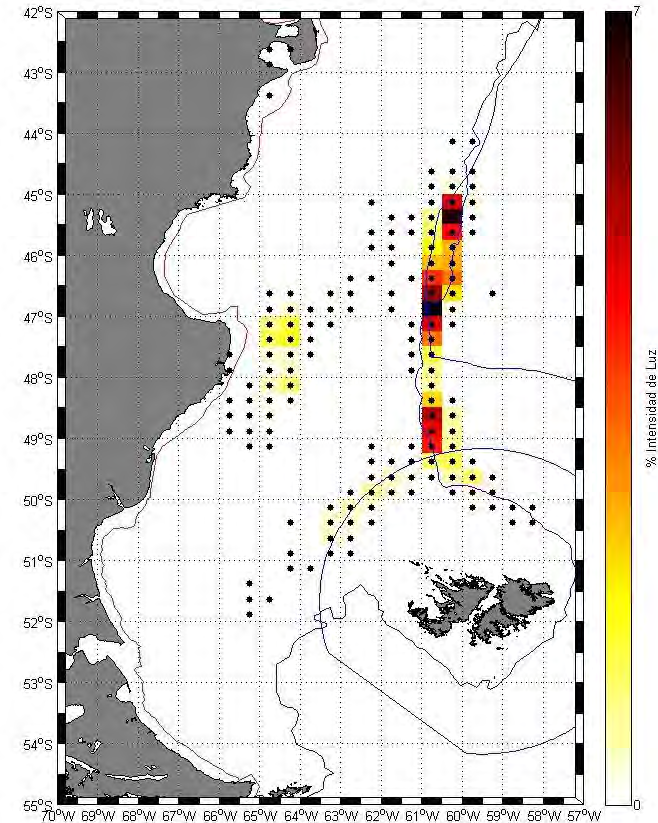
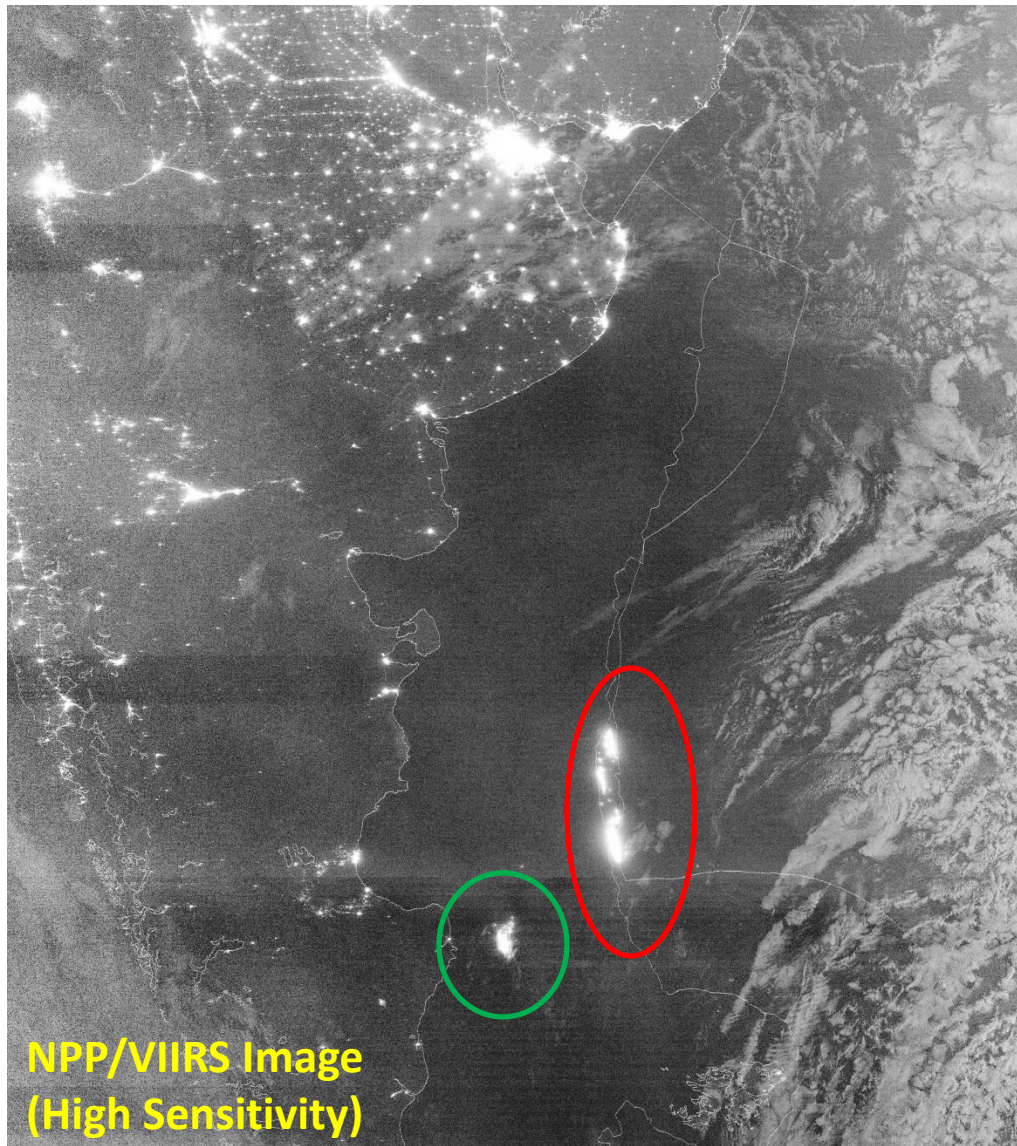


Respuesta espectral del sitio con una concentración de clorofila de 1800 mg/m³



Current Applications in the Sea

Fishery Monitoring (Squid)



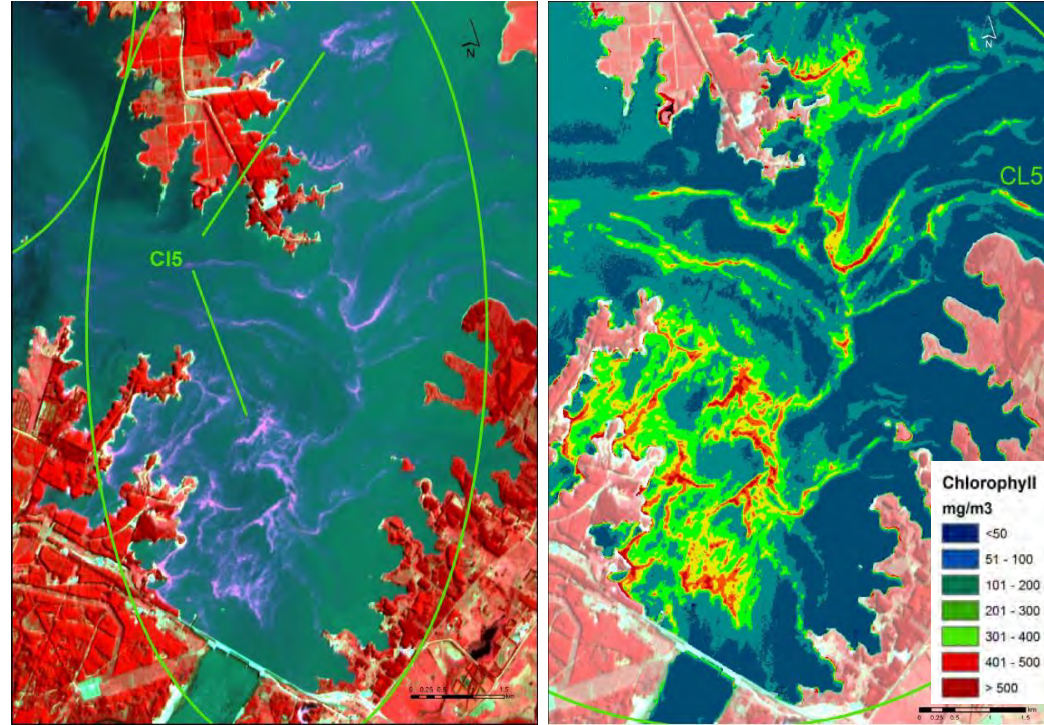
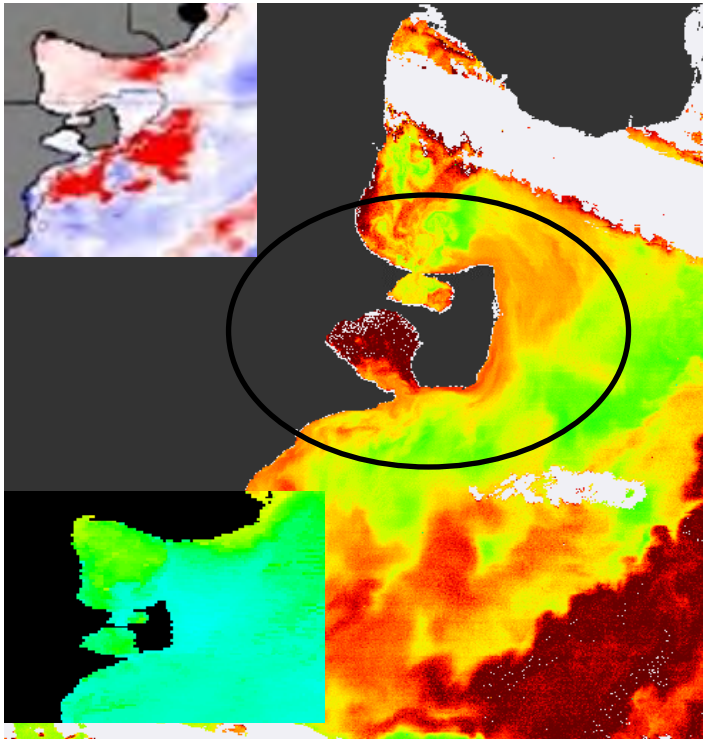
SOURCE: INIDEP

Map of Vessels
Frequency

Lisbon, Portugal
15-18 May 2017

Aquaculture: Identify potential zones and monitoring the HABs

Operative Monitoring of water quality in Salto Grande Dam



LA INTOXICACIÓN POR **MAREA ROJA**

DISFRUTE DE SU ESTADÍA EN NUESTRAS PLAYAS. **PUUEE SER FATAL. EVITARLA DEPENDE DE USTED.**

Se conoce como **MAREA ROJA** a la proliferación de algas tóxicas las que se concentran en los moluscos bivalvos que las consumen volviéndolos tóxicos para el ser humano. Ni el mar ni los moluscos contaminados cambian su color, sabor, olor ni aspecto. Su cocción **NO** elimina la toxina.

NO CONSUMA NI RECOLECTE MOLUSCOS BIVALVOS Y GASTERÓPODOS EN ÉPOCA DE VEDA.

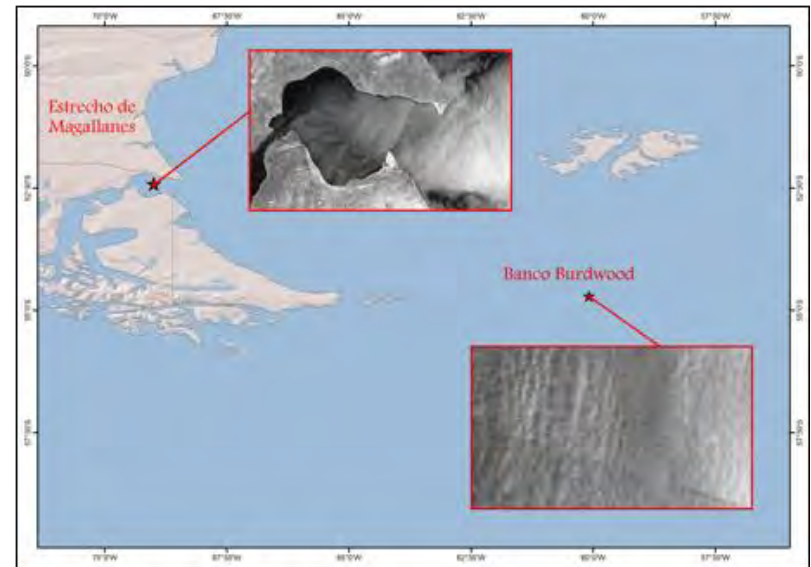
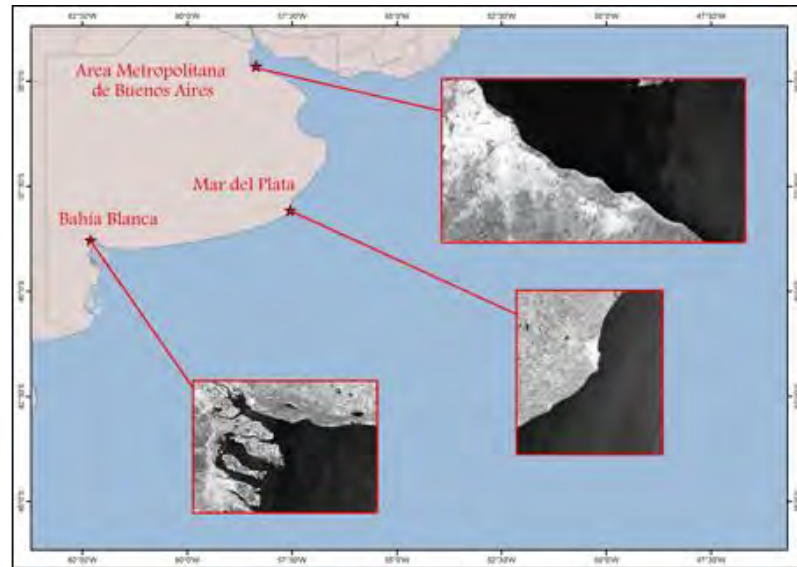
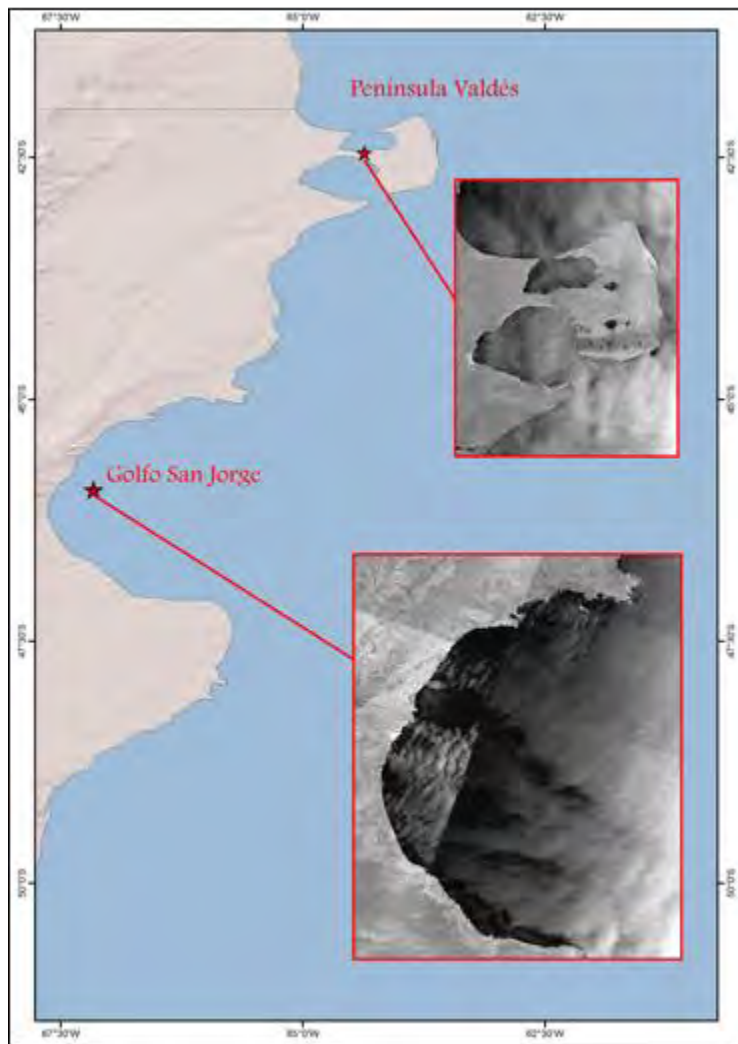
Consuma mariscos de fuentes seguras (pescaderías, restaurantes y boca de expendio habilitadas)

MEJA BLANCA, CARACOL, MEJILLÓN, VIEYRA, CHOLGA, PANOREA

Chlorophyll Index (SPOT data)
 Recurrent Cyanophytes Blooms.
 Cooperation work CARU-CONAE

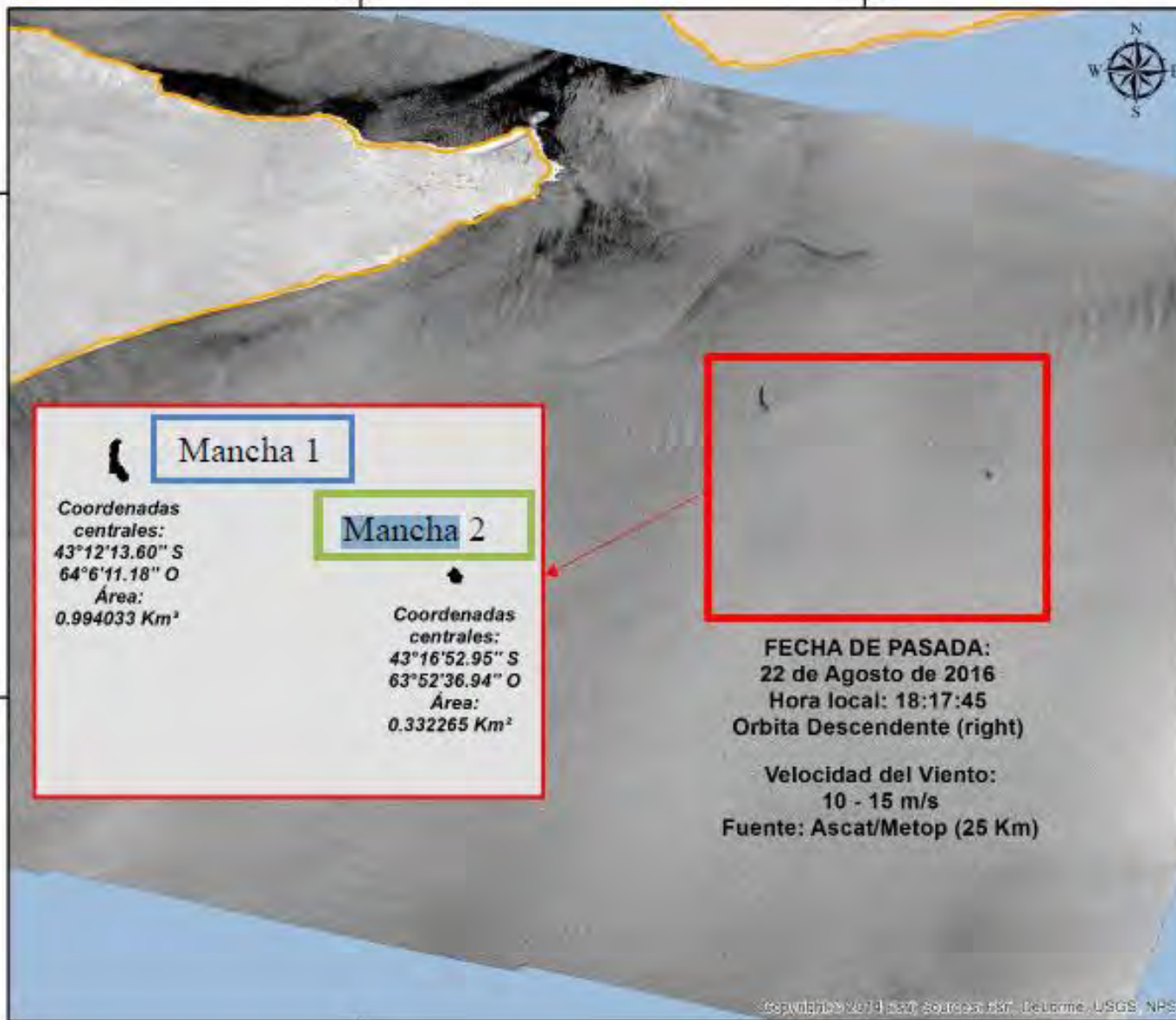
Lisbon, Portugal
 15-18 May 2017

Operative Monitoring of Oil Spill



64°30'0

64°0'0



Mancha 1

Coordenadas
centrales:
43°12'13.60" S
64°6'11.18" O
Área:
0.994033 Km²

Mancha 2

Coordenadas
centrales:
43°16'52.95" S
63°52'36.94" O
Área:
0.332265 Km²

FECHA DE PASADA:
22 de Agosto de 2016
Hora local: 18:17:45
Orbita Descendente (right)

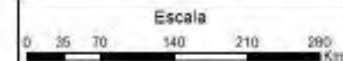
Velocidad del Viento:
10 - 15 m/s
Fuente: Ascat/Metop (25 Km)

Copyright © 2014 Esri, Source: Esri, DeLorme, USGS, NPS

PROYECTO
Monitoreo de petróleo en
el mar y zonas costeras
Año 2016

ALERTA
DERRAME DE HIDROCARBUROS

Península Valdés



1:600.000

Sistema de referencia UTM Faja 21
Datum WGS84

Referencias

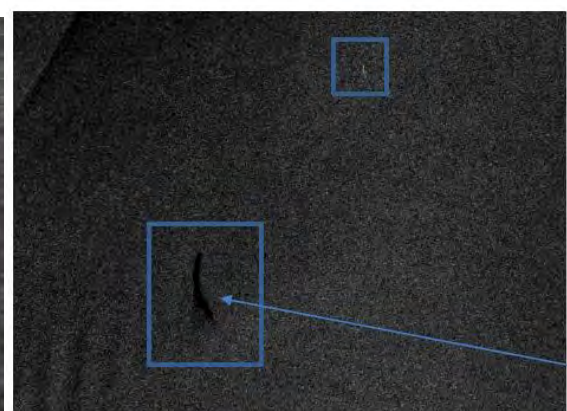
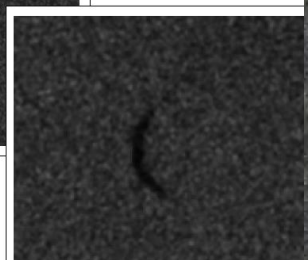
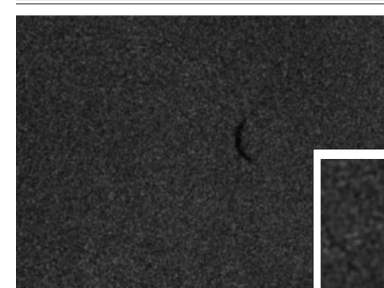
- Posibles derrames detectados
- Línea de costa
- Área de alerta

Imágenes Cosmo SkyMed
Modo WideRegion
Polarización VV

Los productos elaborados para la cartografía
rápida en situación de emergencia se realizan
dentro de un plazo de tiempo muy corto,
optimizando el material disponible. Se trata
de un análisis preliminar aún no validado en
el terreno. El uso y manejo de la información
enviada es responsabilidad del usuario final.

Ubicación relativa

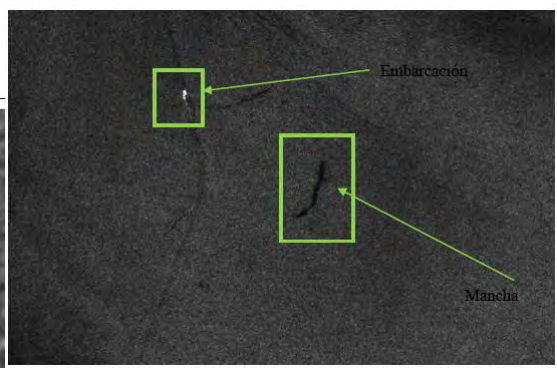
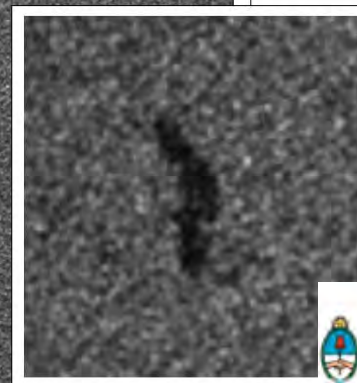
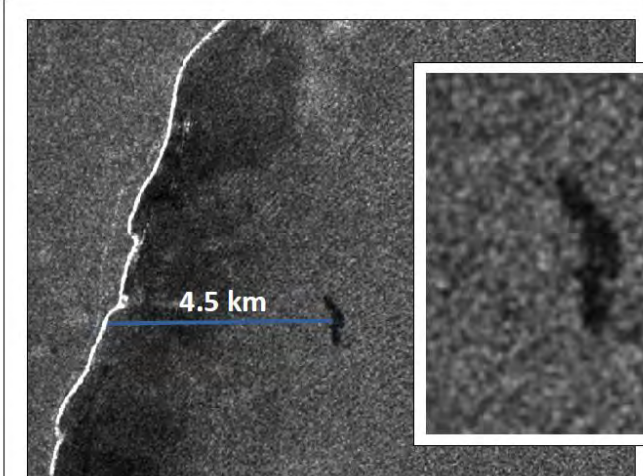
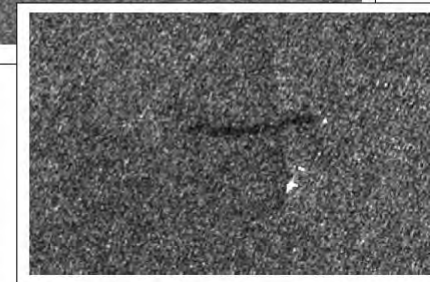
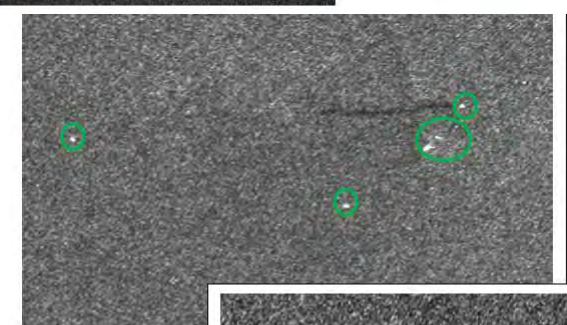
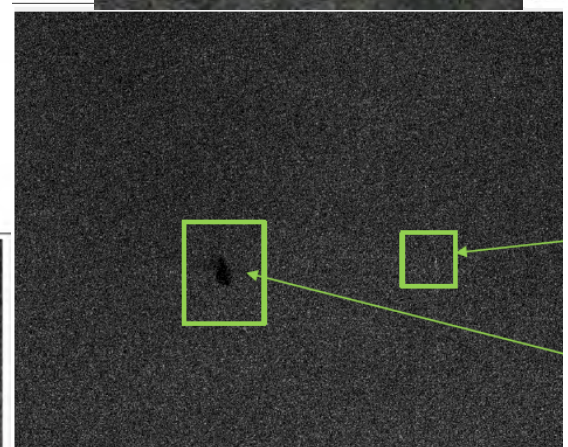
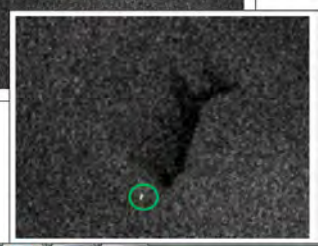


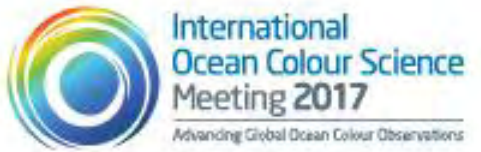


Embarcación



Mancha 1





“Thank very much!!



storrusio@conae.gov.ar



Back Up Slides

Bands – Ocean Color

Band	Wave length [nm]	GSD [m] Regional	GSD [m] Global	L typical [$\text{Wm}^2\text{sr}^{-1}\mu\text{m}^{-1}$]	L max [$\text{Wm}^2\text{sr}^{-1}\mu\text{m}^{-1}$]	S/N @ Ltyp GSD: 1000m
B0	412 ± 5	200	800	79	602	1000
B1	443 ± 5	200	800	68	664	1000
B2	490 ± 5	200	800	52	686	1000
B3	510 ± 5	200	800	45	663	1000
B4	555 ± 5	200	800	34	643	1000
B5	620 ± 5	200	800	21	570	1000
B6	665 ± 5	200	800	16	536	1000
B7	680 ± 3.75	200	800	15	517	1500
B8	710 ± 5	200	800	12	489	1000
B9	750 ± 5	200	800	10	447	600
B10	765 ± 5	400	---	7.8	430	600
B11	865 ± 10	200	800	5.9	333	400
B12	1044 ± 10	400	---	3.7	236	400
B13	1240 ± 10	400	---	0.88	158	250
B14	1610 ± 30	400	---	0.29	82	250

Spectral Justifications/Applications

Reflective Bands	Wavelength (nm)	Applications
B0	412	Coloured Dissolved Organic Matter -Chl separation
B1	443	Chl-a Absorption maximum, band ratio for Chl-a retrieval
B2	490	Chl-a band ratio algorithm and other pigments,
B3	510	Chl-a band ratio algorithm Turbidity, suspended sediment, red tides, strong O ₃ absorption
B4	555	Bio-optical algorithms (e.g. band ratio Chl), turbidity, suspended sediment
B5	620	Cyanobacteria, suspended sediment phycocyanin, total suspended matter (TSM)
B6	665	Chl-b, baseline of fluorescence signal, suspended sediment
B7	680	Chl- a Fluorescence line peak
B8	710	FLH baseline, HABs detection, Chl in highly turbid water, turbid water atmospheric correction
B9	750	Atmospheric correction open ocean
B10	765	Atmospheric correction open ocean, cloud altitude
B11	865	Atmospheric correction open ocean, water vapor reference over the ocean, TSM
B12	1044	Atmospheric correction turbid water, TSM
B13	1240	Atmospheric correction turbid water, TSM
B14	1640	Atmospheric correction turbid water
Emissive Bands	Wavelength (nm)	Applications
B15	10800	Cloud, SST algorithm
B16	11800	Cloud, SST algorithm

Lisbon, Portugal
15-18 May 2017