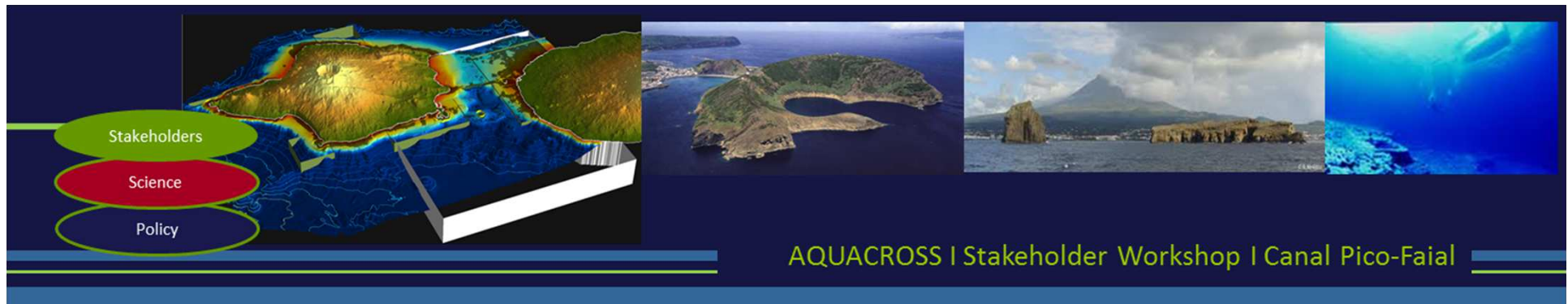


# The socioeconomic dimension of Azorean MPAs The Pico-Faial Channel



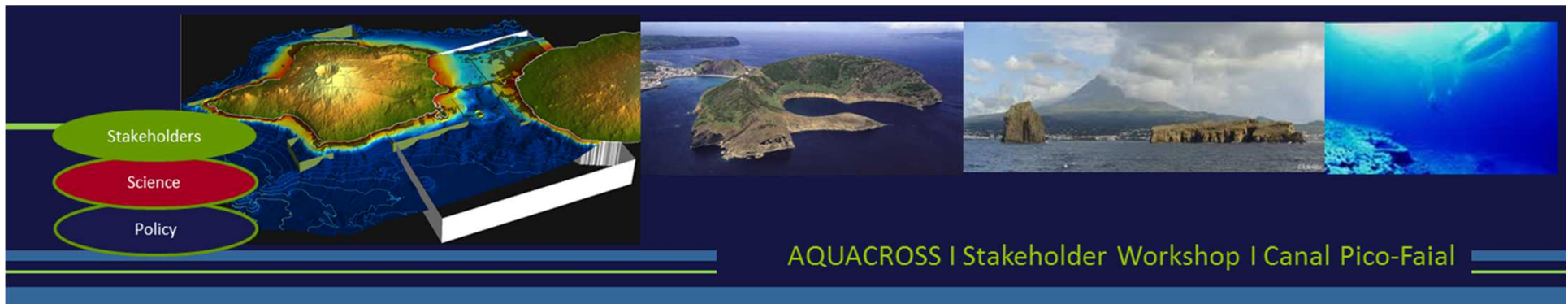
Adriana Ressurreição,  
Eva Giacomello, Nuno Leite,  
Frederico Cardigos, Hugo Diogo,  
Ricardo Serrão Santos

AQUACROSS Workshop  
October 3rd, 2017



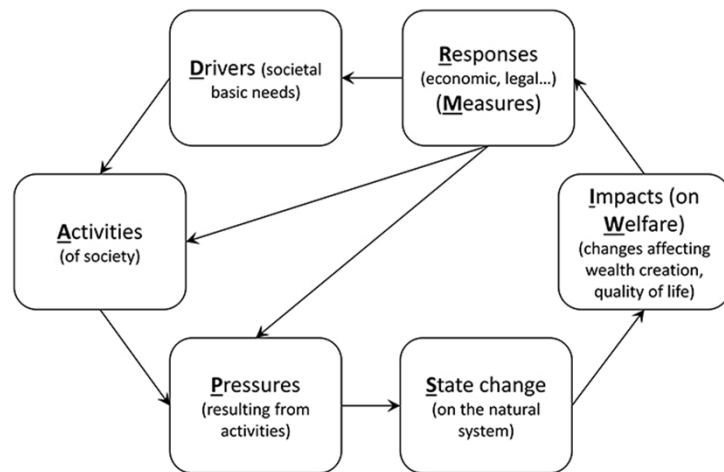
Marine management  
is a **politically** driven  
process, shaped by  
human **uses**,  
livelihoods &  
**perceptions**





As human **pressure** increase

**Engage** society to tackle marine challenges



Wolanski & Elliott, 2015

Societal behaviour **change**

Likelihood of **agreement**

Resolve **conflicts**

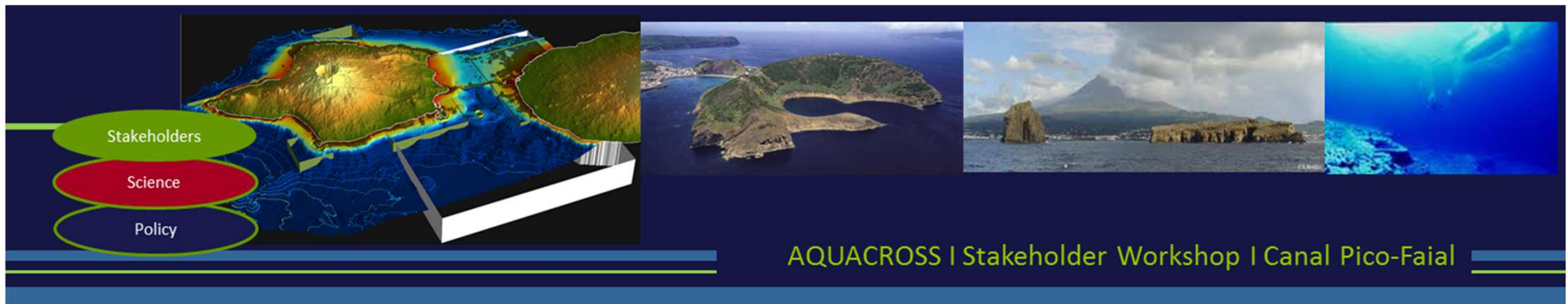
Sharing **knowledge**

Promote **trust**



Particularly **important** for **MPAs**





## Ecosystem Based Management

Levels	Scientific Advice	Management Framework
<b>EBM</b> Ecosystem Based Management	Fisheries            Development            Energy            Eco Tourism            Oil & Gas Conservation            Marine            Sanctuaries            Aquaculture            Etc	Regional Ocean Plans
<b>EBFM</b> Ecosystem Based Fisheries Management	Fisheries            Climate            Habitat            Predator	Fisheries Ecosystem Plan
<b>EAFM</b> Ecosystem Approach to Fisheries Management	Fisheries            Climate            Habitat            Predator	Fishery Management Plan
<b>SS</b> Single Species	Fisheries	Fishery Management Plan



### Current Practice: Conventional Management

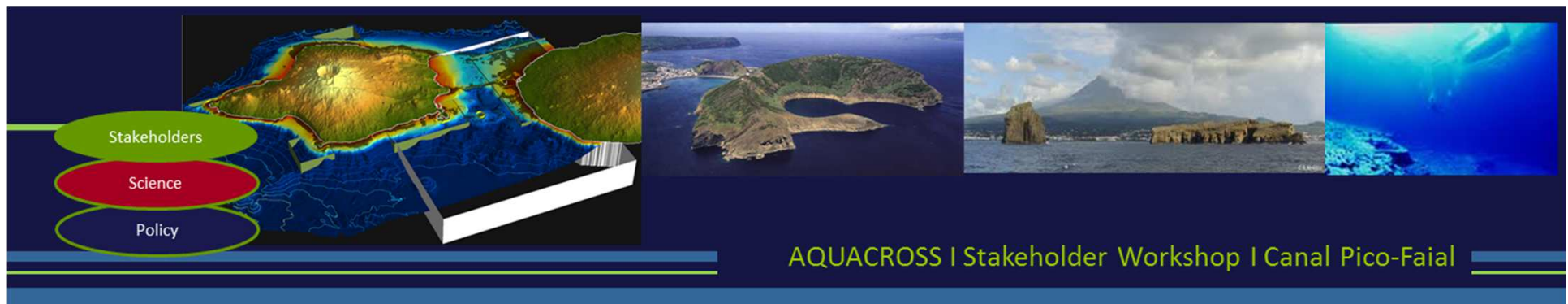
- Individual Species
- Individual Human Activities Evaluated
- Management by Individual Sectors
- Narrowly Focused Scientific Monitoring Programs
- Observations Serving a Single Use and Purpose

### The Goal: Ecosystem-Based Management

- Multiple Species
- Humans Integral Part of Ecosystem
- Multi-Sector Resource Management
- Adaptive Management Based on Scientific Monitoring
- Shared and Standardized Observations

Developed by NOAA Fisheries

Integrated and socioeconomic studies



## Azores Integrated and socioeconomic studies



Resident and expert opinions on marine related issues: Implications for the ecosystem approach

Adriana Ressurreição<sup>a,\*</sup>, Alexandra Simas<sup>b</sup>, Ricardo S. Santos<sup>a</sup>, Filipe Porteiro<sup>a</sup>

<sup>a</sup>Centre of IMAR of the University of the Azores, Department of Oceanography and Fisheries/UAz & IARSyS Associated Laboratory, Rua Prof. Doutor Frederico Machado 4, 9901-862 Horta, Portugal

<sup>b</sup>Azores Sea Observatory (OMA), Fábrica da Baleia de Porto Pim, Monte da Guia, 9900 Horta, Portugal



Quantifying the direct use value of Condor seamount

Adriana Ressurreição<sup>a,\*</sup>, Eva Giacomello

Centre of IMAR of the University of the Azores, Department of Oceanography and Fisheries/UAz & IARSyS Associated Laboratory, 9901-862 Horta, Portugal



Different cultures, different values: The role of cultural variation in public's WTP for marine species conservation

Adriana Ressurreição<sup>a,\*</sup>, James Gibbons<sup>b</sup>, Michel Kaiser<sup>c</sup>, Tomaz Ponce Dentinho<sup>d</sup>, Tomasz Zarzycki<sup>e</sup>, Charlotte Bentley<sup>c</sup>, Melanie Austen<sup>f</sup>, Daryl Burdon<sup>g</sup>, Jonathan Adkins<sup>h</sup>, Ricardo S. Santos<sup>a</sup>, Gareth Edwards-Jones<sup>b</sup>

Vol. 467: 15-28, 2012  
doi: 10.3354/meps09967

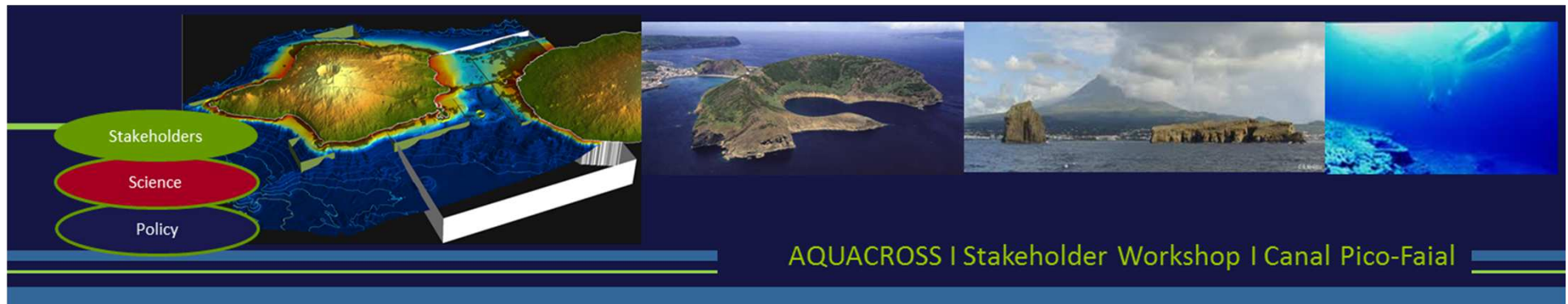
MARINE ECOLOGY PROGRESS SERIES  
Mar Ecol Prog Ser

Published October 25



### Towards an ecosystem approach for understanding public values concerning marine biodiversity loss

Adriana Ressurreição<sup>1,\*</sup>, Tomasz Zarzycki<sup>2</sup>, Michel Kaiser<sup>3</sup>, Gareth Edwards-Jones<sup>4,†</sup>, Tomaz Ponce Dentinho<sup>5</sup>, Ricardo S. Santos<sup>1</sup>, James Gibbons<sup>4</sup>



## Integrated and socioeconomic studies Results

### **High level of social demand for marine biodiversity conservation**

Despite citizen's limited level of understanding on marine environmental issues there was a clear evidence that people do care about MB conservation

### **WTP ecosystem > WTP individual marine taxa**

Greater benefits were attached to the conservation of the ecosystem as a whole rather than to partial conservation plans

### **WTP mammals = Fish > birds, inverts, algae**

Yet low profile taxa such as algae and inverts were highly valued as well

Significant  $\neq$  among **experts** and **public opinion**

Drivers of change, marine pressures and management priorities



# Ocean health and evolution

## Residents vs Experts

Table 1. Respondents' perceptions about ocean health and its evolution over time

Ocean Health	Residents (%)	Experts (%)
Very bad	1%	0%
Degraded	3%	2%
Reasonable	33%	28%
Good	49%	53%
Very Good	13%	14%
<i>Don't Know</i>	2%	2%
N	692	43
p= 0.403 (n.s.)		
Ocean Evolution	Residents(%)	Experts (%)
It has deteriorated	32%	53%
It has not change significantly	39%	26%
It has improved	18%	14%
<i>Don't Know</i>	11%	7%
N	692	43
p= 0.018 (**)		



Stakeholders

Science

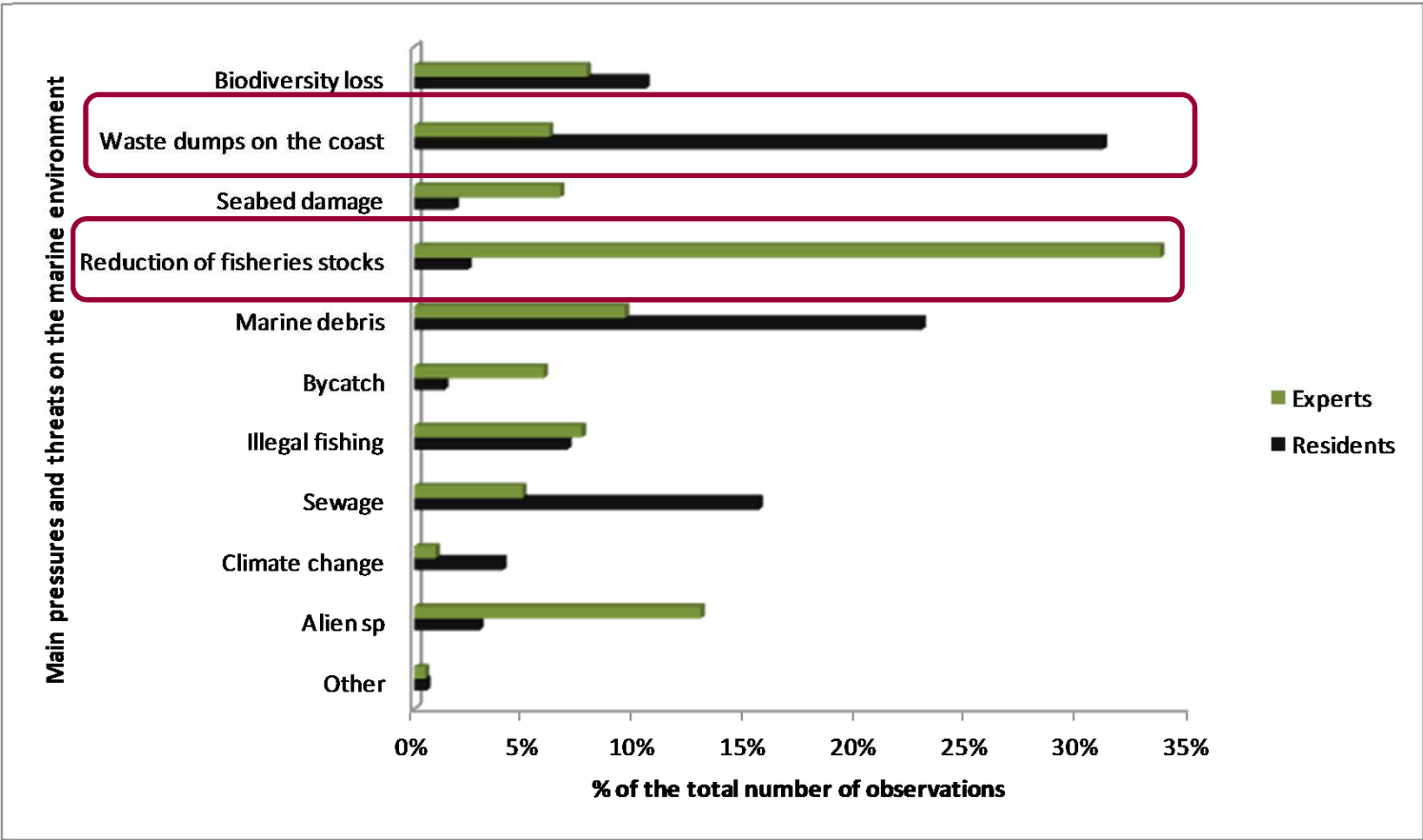
Policy



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# Marine pressures and threats

98% Experts  
62% Residents







## Knowledge and attitudes on MPAs

63% residents were familiar with MPAs

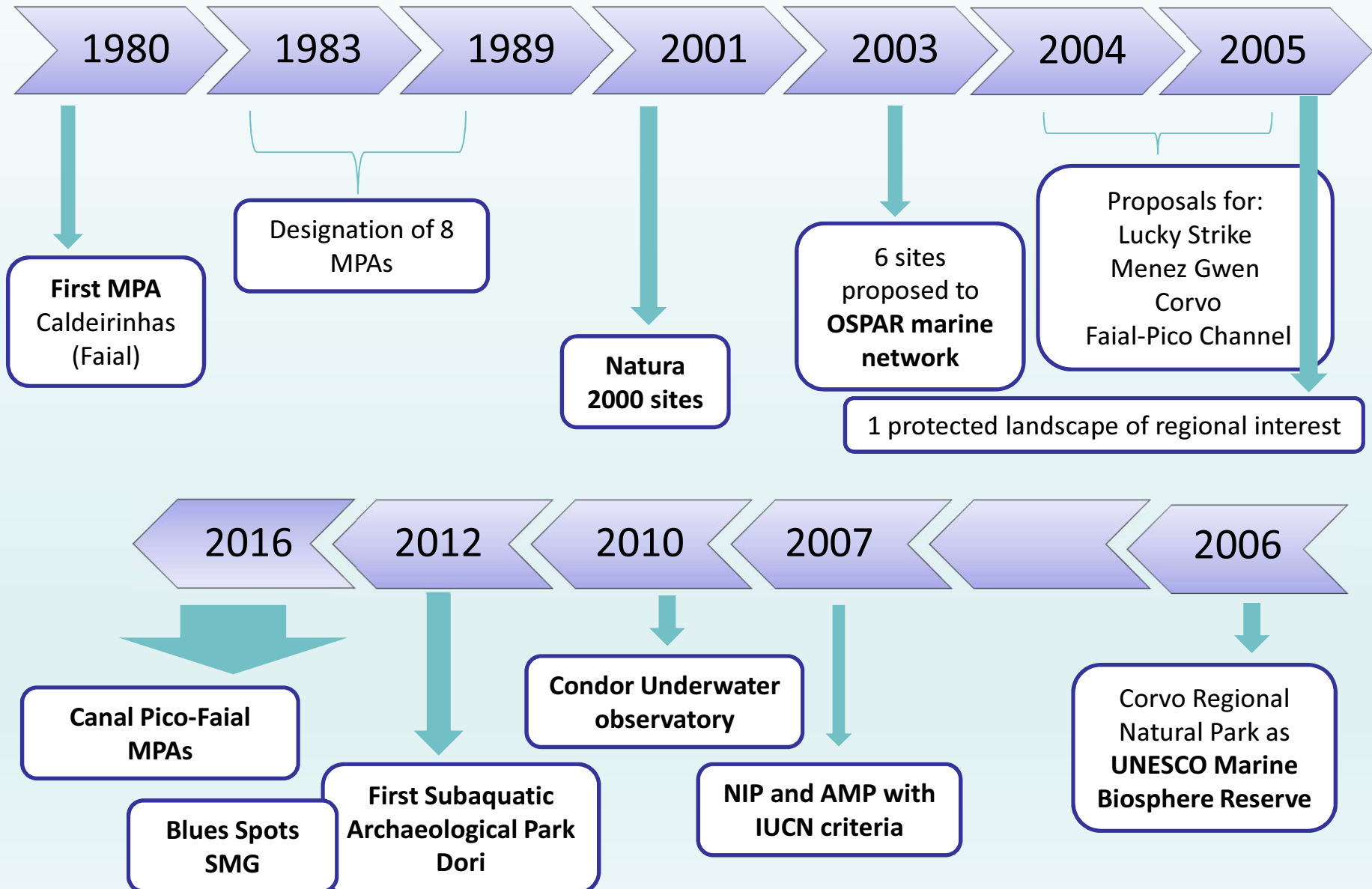
46% residents aware of MPAs in the Azores

Table 2. Respondents' attitudes and knowledge on MPAs in the Azores

Knowledge	Residents	Experts						
% of respondents familiar with the term MPA	63%	100%						
% of respondents aware of the presence of MPAs in the Azores	46%	100%						
	Residents (% of the total responses)				Experts (% of the total responses)			
Statements	Agree	Disagree	NAD(*)	Mean	Agree	Disagree	NAD(*)	Mean
MPAs help to protect biodiversity	95%	2%	3%	4.42	95%	2%	3%	4.56
MPAs help to attract tourists and improve the quality of recreational activities	80%	9%	11%	4.00	81%	9%	10%	4.14
MPAs are good management tools but if there is no surveillance it does not work	94%	2%	4%	4.47	100%	0%	0%	4.72
MPAs benefit fisheries and enhance fish abundance	77%	11%	12%	3.92	74%	14%	12%	3.91
MPAs help to reduce conflict between the different activities	57%	16%	27%	3.54	51%	26%	23%	3.42

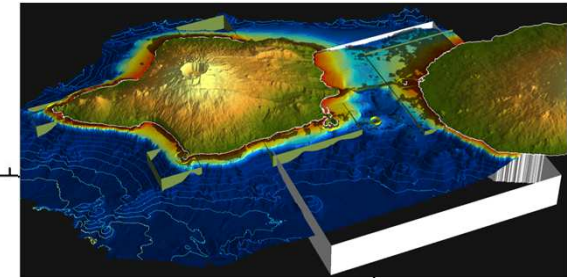
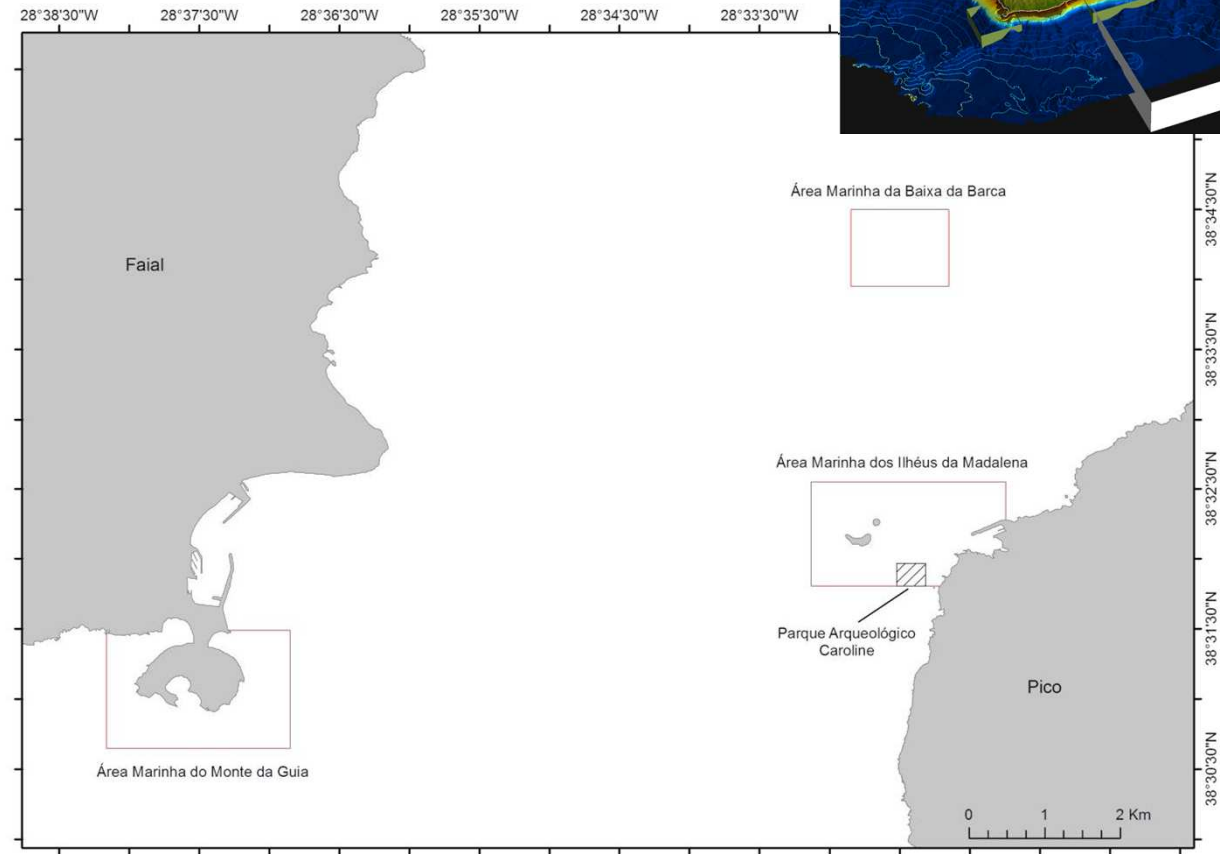
(\*) NAD: neither agree nor disagree

# Timeline of MPAs in the Azores





## MPAs Pico-Faial Channel



**Participatory bottom-up process**  
Recognition of **value** to marine **tourism**

Stakeholders

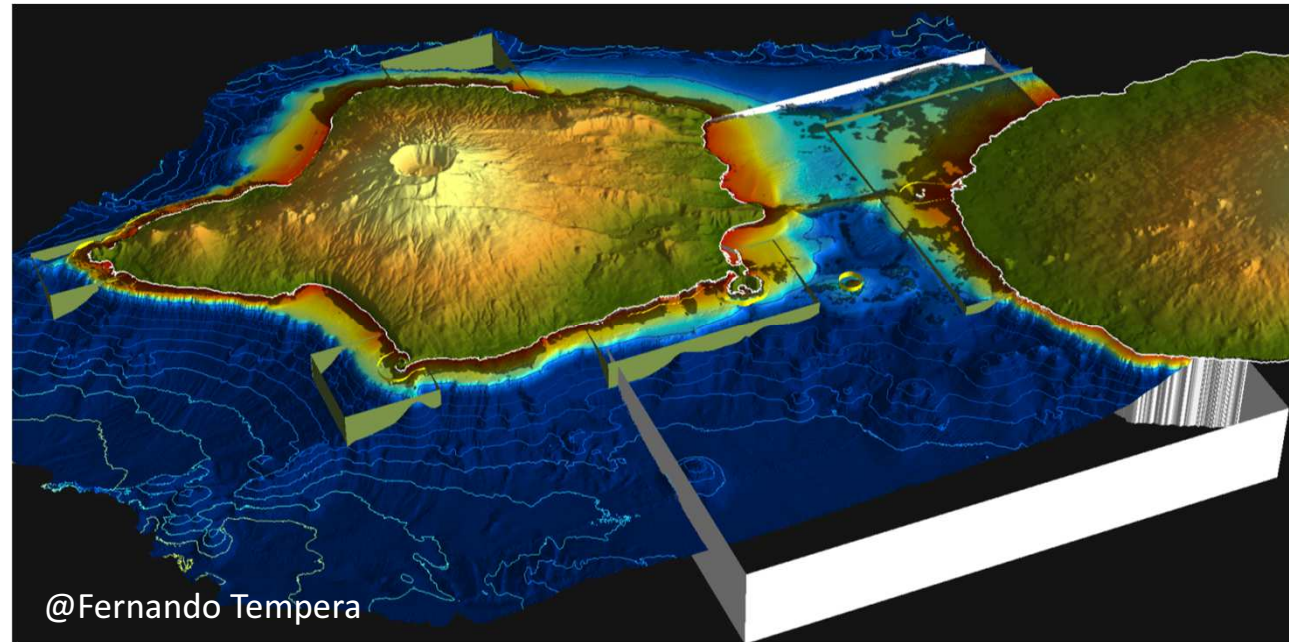
Science

Policy



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## MPAs Pico-Faial Channel







## Pico-Faial channel | Uses

### **Extractive activities**

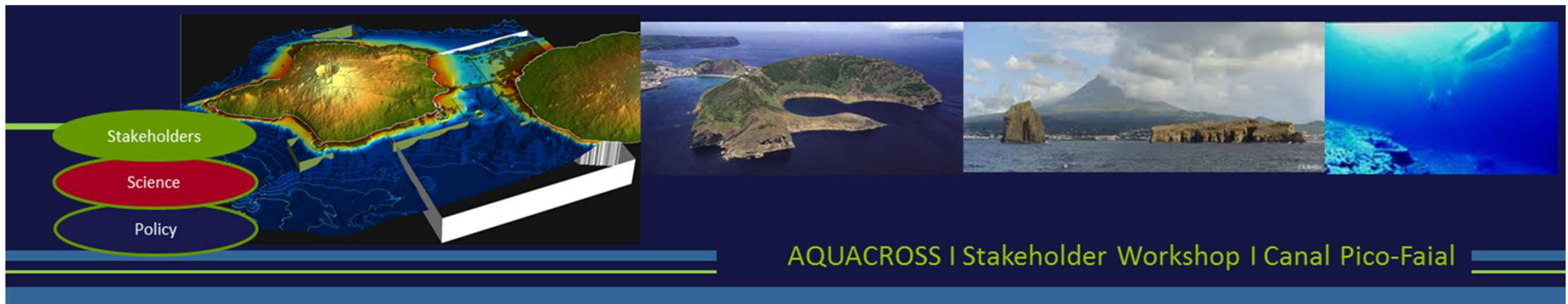
Recreational Fisheries  
Comercial Fisheries  
Dredging

### **Non-extractive activities**

Marine ecotourism  
Nautical sports  
Science  
Transportation  
Ship repair  
Port of call

**Uses** poorly monitored  
**Benefits** poorly quantified





## Extractive activities

### Dredging



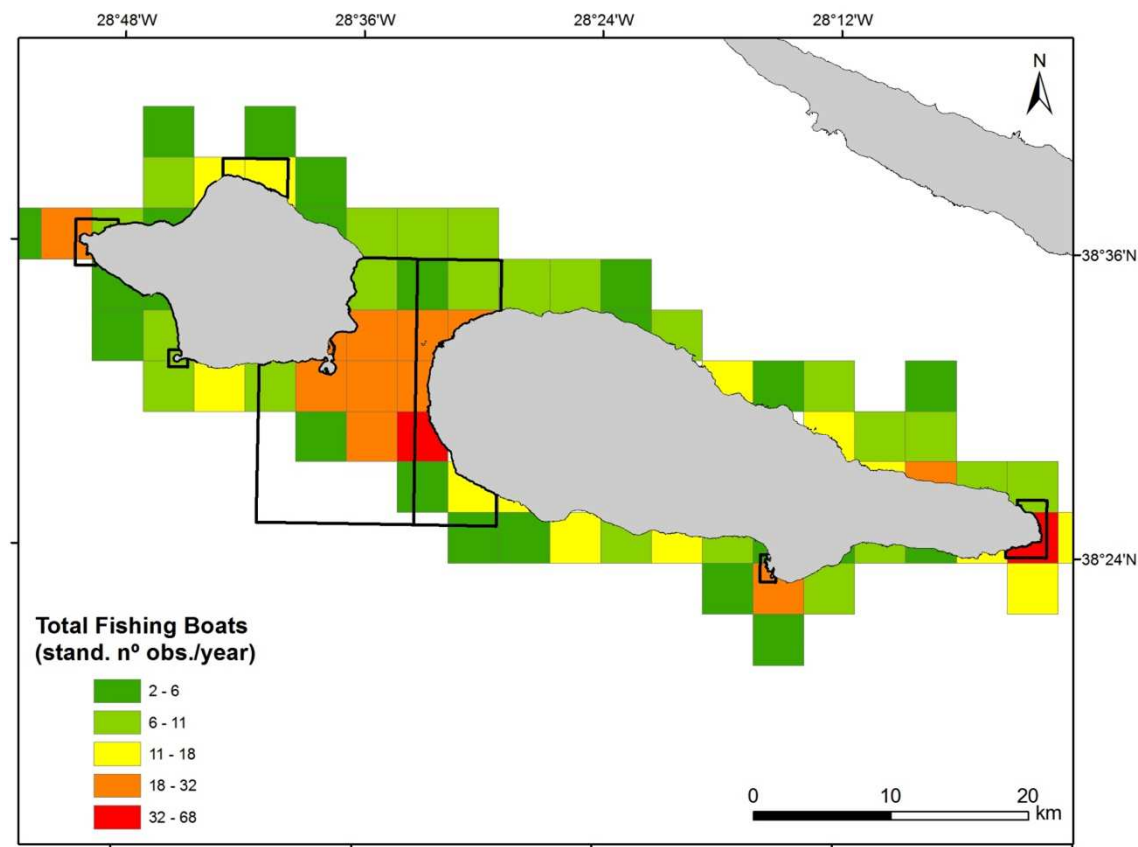
**DLR 9/2010/A**

Volume per year (?)  
Socioeconomic impact (?)  
Ecological Impact (?)



# Extractive activities

## Total fishing boats



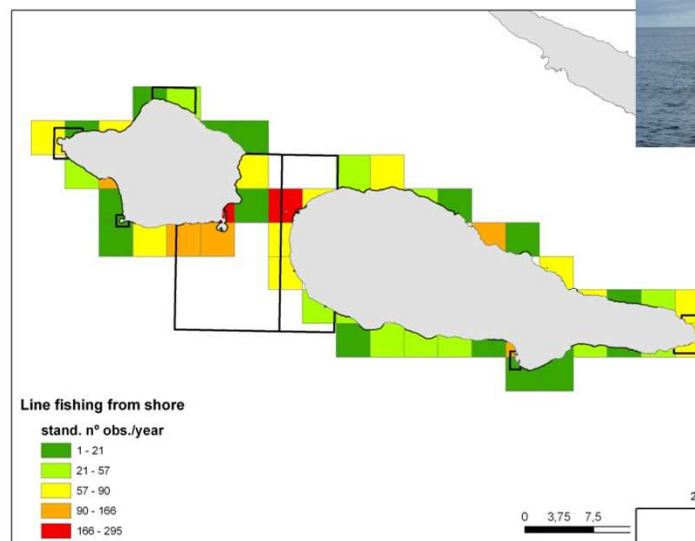
Diogo (2012) oral communication

# Extractive activities

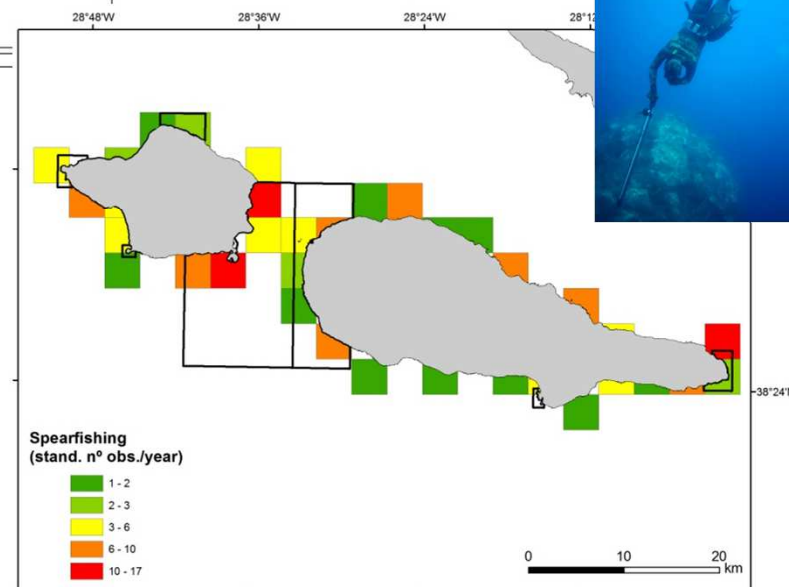
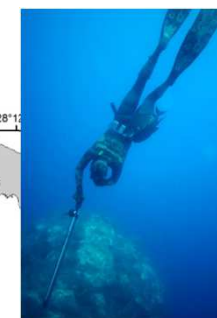
## Recreational Fisheries



Fishing from coast



Spear fishing



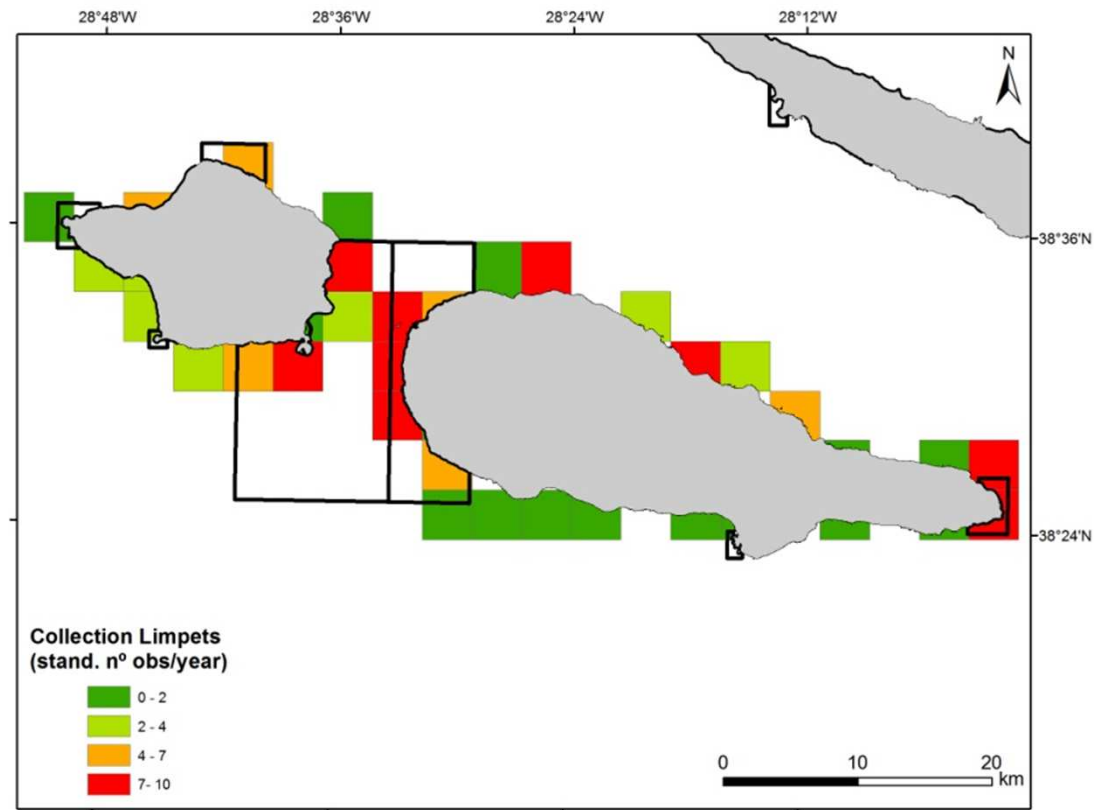
Diogo (2012) oral communication





# Extractive activities

## Recreational Fisheries



## Limpets

40% effort inside MPAs

Diogo (2012) oral communication

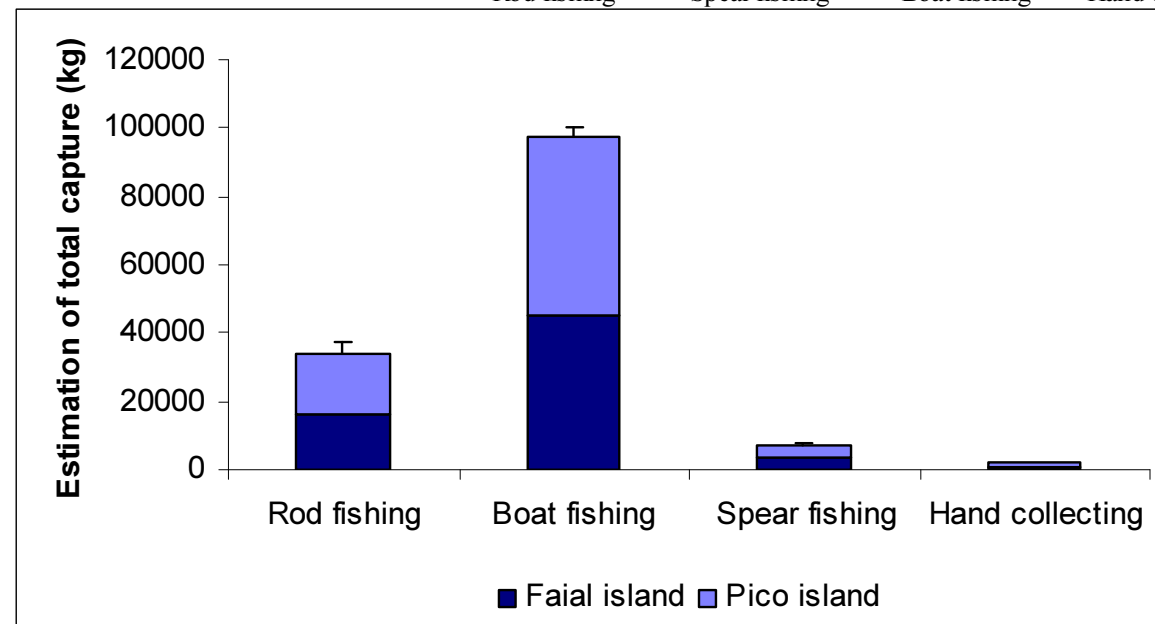
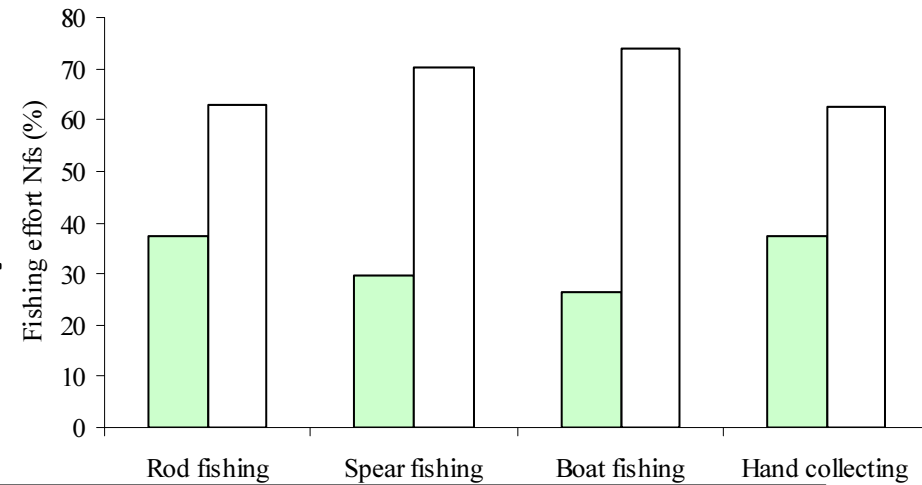


# Extractive activities

## Recreational Fisheries

138 ton/year

Channel: 37 ton/year

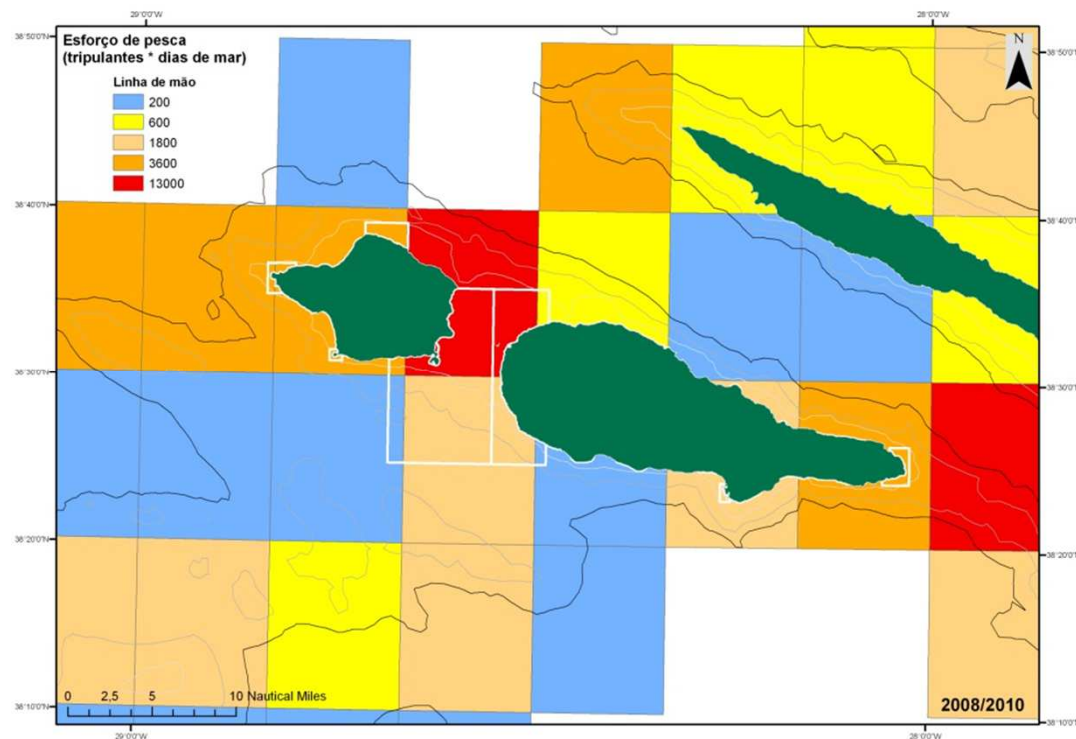


Diogo (2012) oral communication



# Extractive activities

## Commercial Fisheries



**Handline 44ton/year**

**Diogo (2012)** oral communication



## Methods

## Official data

## In-depth Interviews

Marine Operators

## Logbooks

**QUESTIONNAIRE FOR DIVING OPERATOR**

The survey is part of a scientific research project, undertaken by the Azores University, among thousands of the Azorean sea. The aim of the project is to identify areas of recreational interest in the waters around the Azores and to estimate the value of different parts of the Azorean sea in relation to the activities carried out in the region (mainly recreational fishing). The study will enable the inclusion of marine-based tourism in management plans, contributing for the long-term conservation and sustainable use of the marine environment. Any information given will be used for statistical purposes only, in complete confidentiality. Information identifying individual marine-based operators will not be disclosed under any circumstances. Your cooperation in answering these questions is greatly appreciated. For further information please contact: Mariana Paes Pereira ([mpereira@uaac.pt](mailto:mpereira@uaac.pt)) or 292 200 400 or 292 200 430.

1. Date: \_\_\_\_\_ 2. Level: \_\_\_\_\_

**DESCRIPTION OF YOUR MARINE-BASED TOURISM OPERATION**

3. Name of the fishing/diving operation: \_\_\_\_\_

4. Date of establishment: \_\_\_\_\_

5. Manager's name: \_\_\_\_\_

6. When did you start this job: \_\_\_\_\_

7. Home port: \_\_\_\_\_

8. Number of jobs, including manager (excluding part-time)

	Number of jobs	Full-time	Part-time
Permanent:	1		
	2		
	3		
	4		
	5		
Seasonal:	1		
	2		
	3		
	4		
	5		

9. How many boats do you run? \_\_\_\_\_

10. What are their technical characteristics?

Type of boat	Length (meters)	Engine (HP)	Engine power (KW)	Annual use of engine (hours)

This inquiry is part of the research work on Condor seamount, conducted at the Institute of Marine Research-Department of Oceanography and Fisheries of the University of the Azores. Data will be used for scientific purposes exclusively. Should you wish to have more information about the project, please contact Eva Giacomello (tel. 292200400; [evagiacomello@uaac.pt](mailto:evagiacomello@uaac.pt)). Thank you for your collaboration.



2013

### Shark diving



Sport fishing 2013

### SPORT FISHING Captures and observations

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Data: \_\_\_\_/\_\_\_\_/2013

Barco	Área	Latitude/Longitude	Espécie	Peso (kg ou libras)	Abaloçado	Tempo	Nº horas pesca
Notas (quantidade de laca e aves: alta/meda/baixa; vento: etc)							
Notas (quantidade de laca e aves: alta/meda/baixa; vento: etc)							
Notas (quantidade de laca e aves: alta/meda/baixa; vento: etc)							
Notas (quantidade de laca e aves: alta/meda/baixa; vento: etc)							
Notas (quantidade de laca e aves: alta/meda/baixa; vento: etc)							



Stakeholders

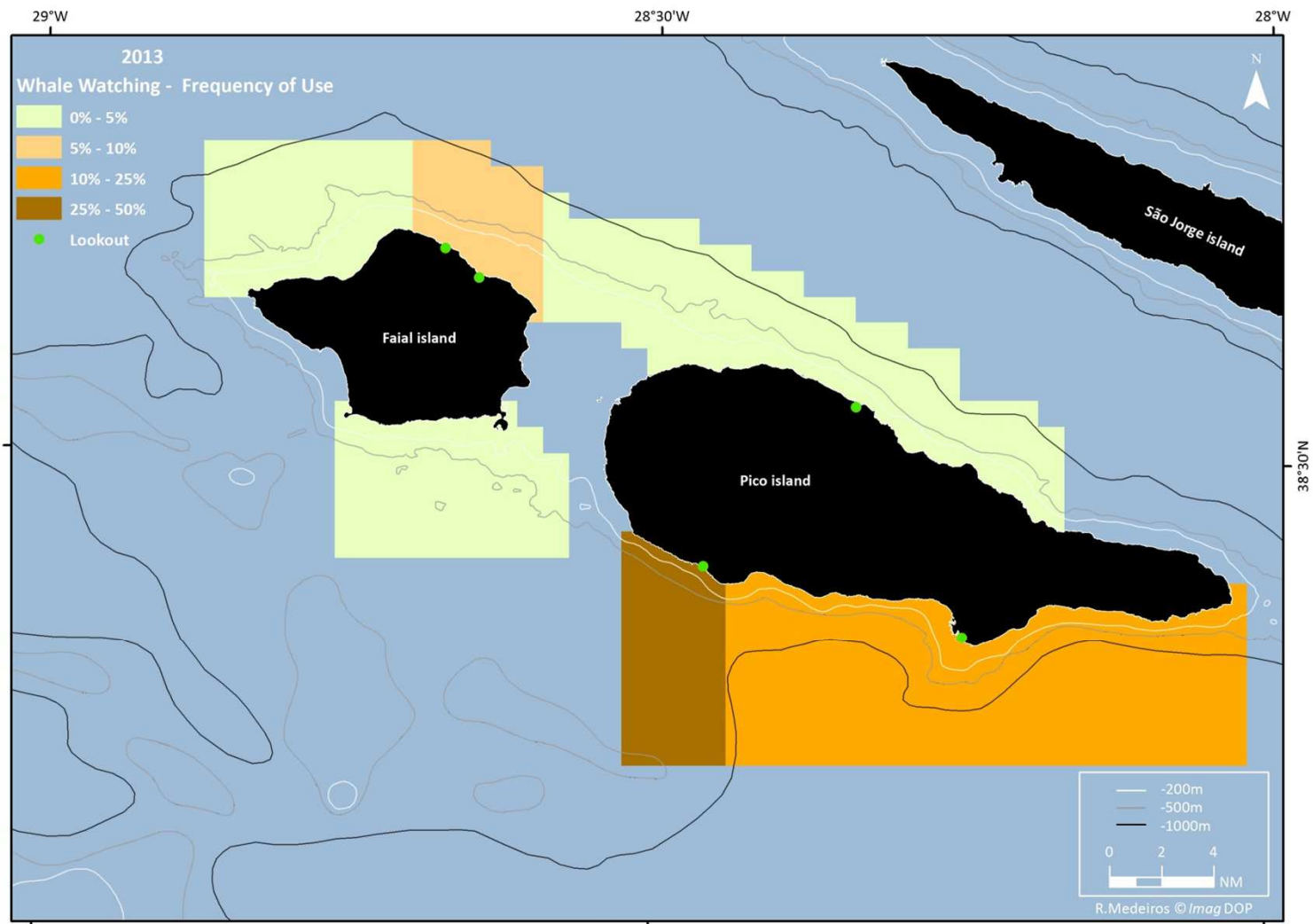
Science

Policy

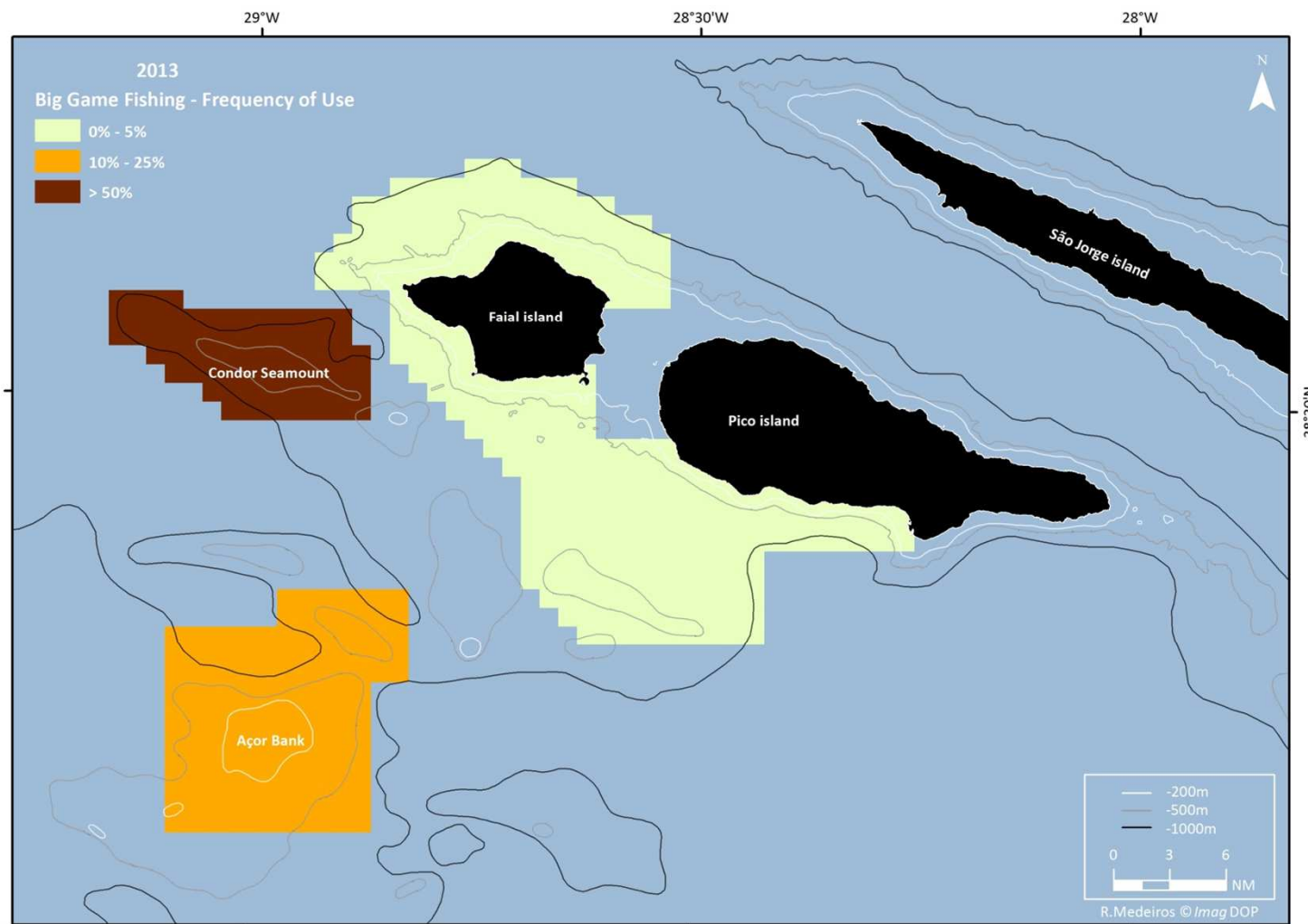


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# Whale Watching



# Big Game Fishing



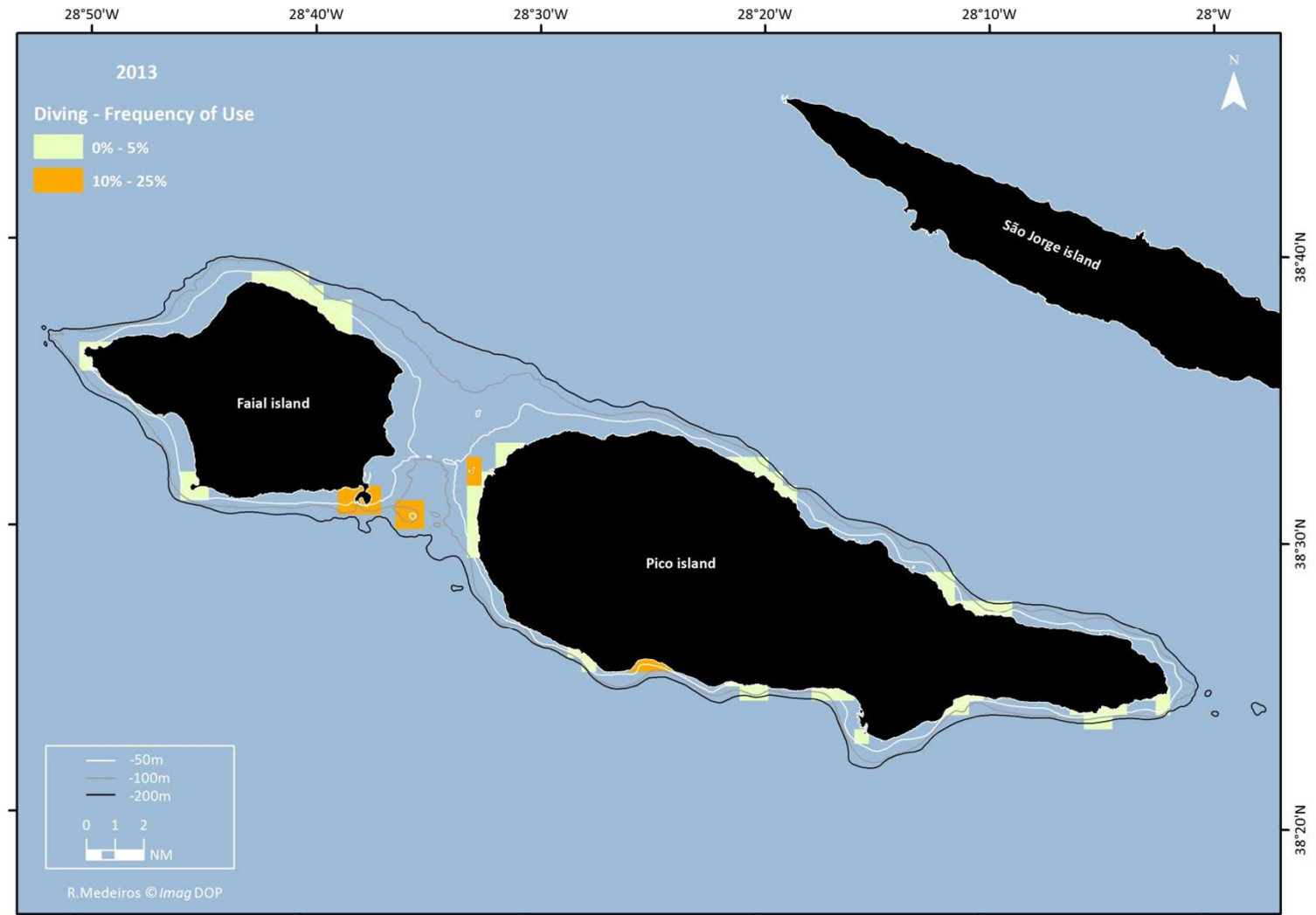
Stakeholders

Science

Policy

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# Coastal Diving

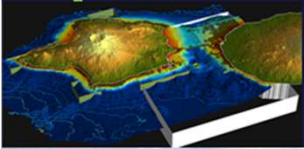


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Stakeholders

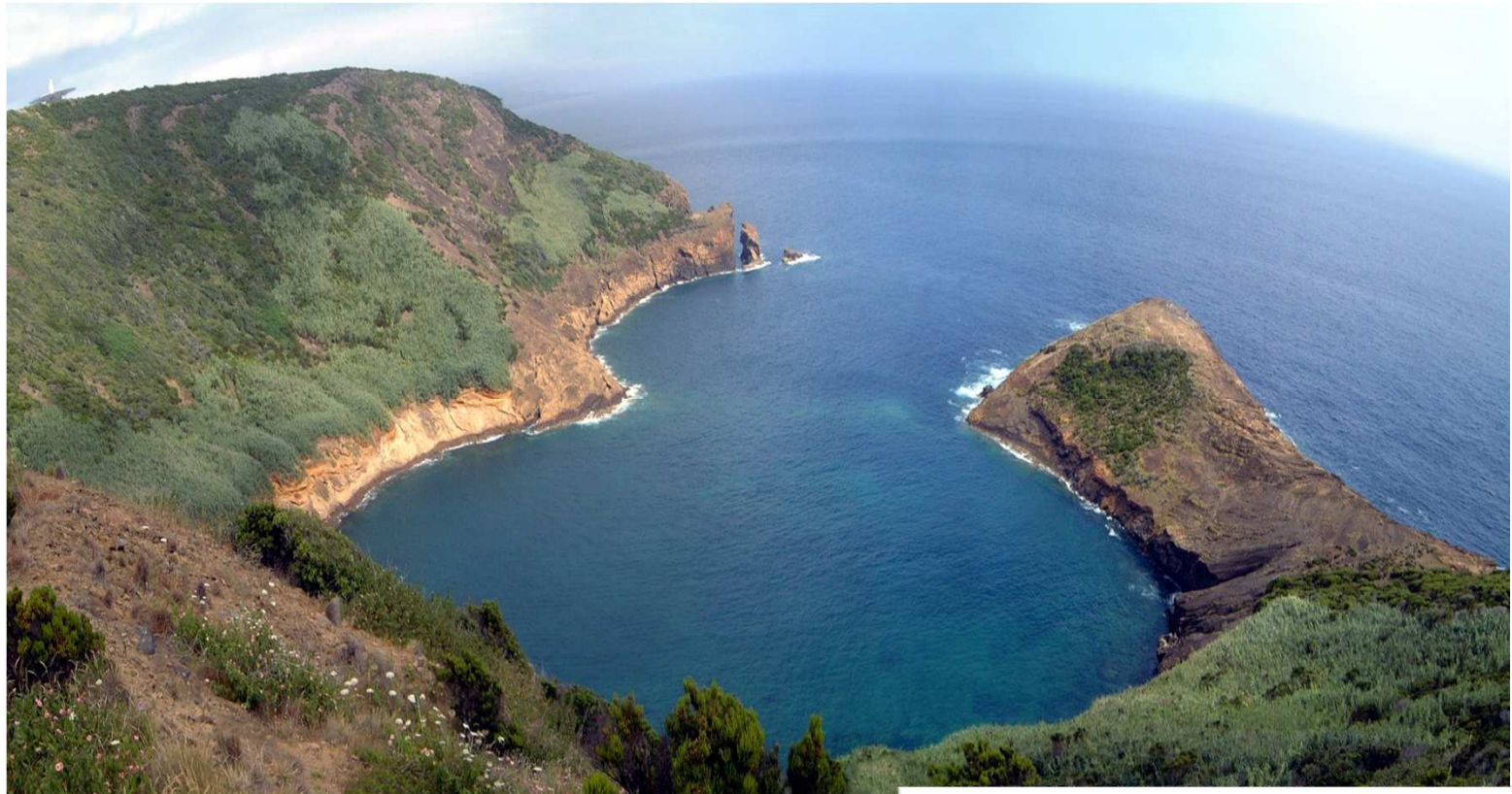
Science

Policy





# Monte da Guia



- Nature reserve IUCN I
- All human activities **prohibited**
- Diving in surrounding areas (Monte da Guia)
- **25%** of total dives in Pico/Faial

*Hot Spot*



MSP

Policy

Science

Project SciPol-ISeMars





# Ilheus da Madalena

MSP

Policy

Science



Project SciPol-ISeMarS

- 20% of total dives from Pico /Faial
- Recreational & Comercial fisheries prohibited
- Exception: Fishing for live bait and fishing from shore

*Hot Spot*



# Problems hindering the establishment of MPAs in the Azores

MSP

Policy

Science



Project SciPol-ISeMarS



Legislation **ambiguity**

Several of the Azorean Marine reserves  
allow **extractive**  
**activities**

**Illegal** fishing

Depletion of **fish**  
**species**

Deposit of marine litter

## Conclusions

- Despite its limited area, Marine reserves have a major contribution to **cultural services**
- **Hot-spots** for marine recreation: **Diving** and BGF
- Some areas support more than **50% of diving** and fishing trips based from adjacent islands, differentiated types of activities with **added value**
- Marine reserves generate significant **economic benefits** to local economies, **1,2 M€ direct use value**
- Benefits for **non-extractive uses** > extractive-uses





➤ **Socio-economic** and **spatial distribution**  
at a fine resolution

➤ **Trade offs** among different uses

**Conflicts**

**Prioritize areas for conservation**

➤ **Integrate** different types of values

**Uses & Values & Perceptions**  
dynamic



**Monitoring**



# Thanks!

contactos

aressurreicao@uac.pt

ricardo@uac.pt

<http://scipol-isemars.wix.com/scipol-isemars>

Project SciPol-ISeMarS



MSP

Policy

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Divers, whale watchers, fishers who took time to answer our questionnaire survey

Managers of marine-tourism companies who provided invaluable information

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