Reef monitoring and reef health status of French Indian Ocean Territories

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Towards an efficient assessment for adequate management & conservation actions

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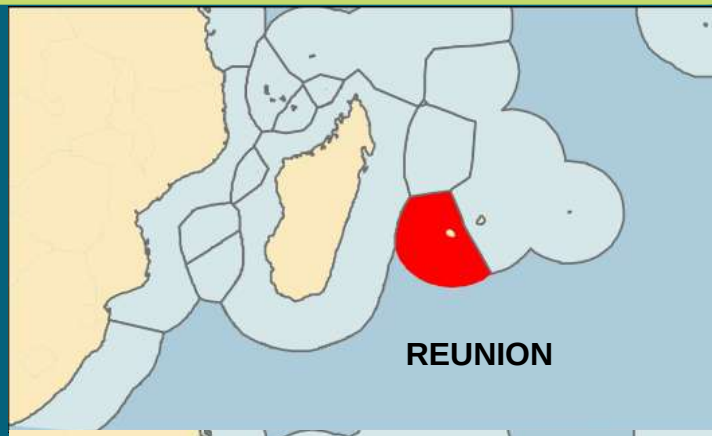
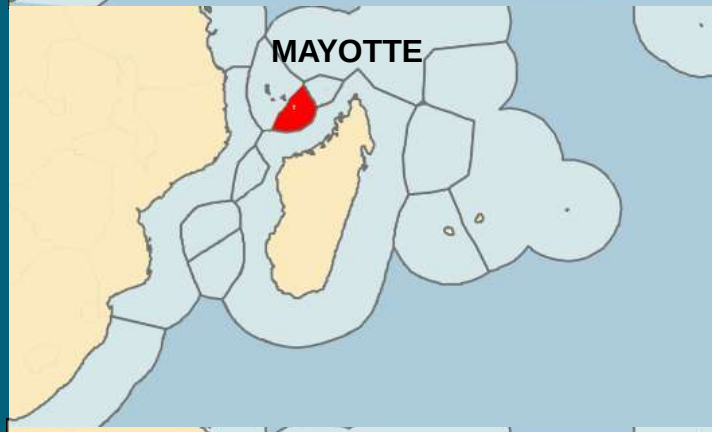
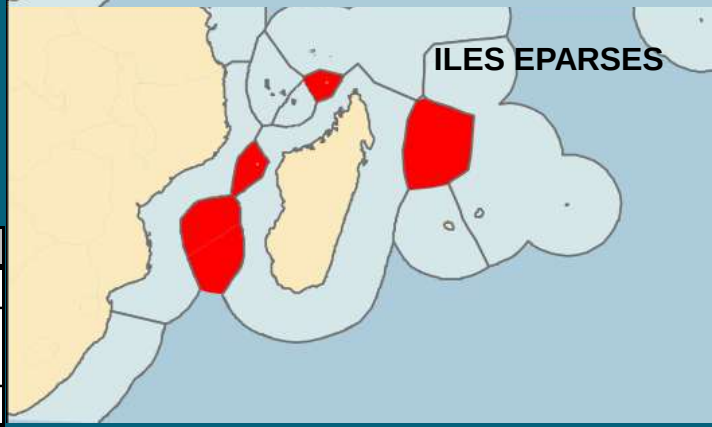
Coral reef of Indian ocean French territories : an heterogeneous situation

- **A diversity of habitats displayed in the french territories located in the Mozambic channel or East of Madagascar.**
- **Growing monitoring programs going on concerning mainly corals and fish communities and more recently Invertebrates, water quality, physical parameters such as Temperature.**
- **10 years data sets for both Mayotte and Réunion**
- **The monitoring network is actually set up as part of the IFRECOR action plan RESOBS activity.**







Island	Fish	Coral	Seagrass	Molluscs
1. Mayotte (Zelée)	765 (2009)	env. 200	12 (7 genus)	>1000 (estimate)
2. Iles éparses + Geyser	Entre 305 et 568 per island		5 genus	?
3. Reunion	965 (2009)	170 (2010)	1 (1 genus)	1 348 (2010

Coral reef monitoring: different scale and expertise levels

1. Reunion

Fauna and flora

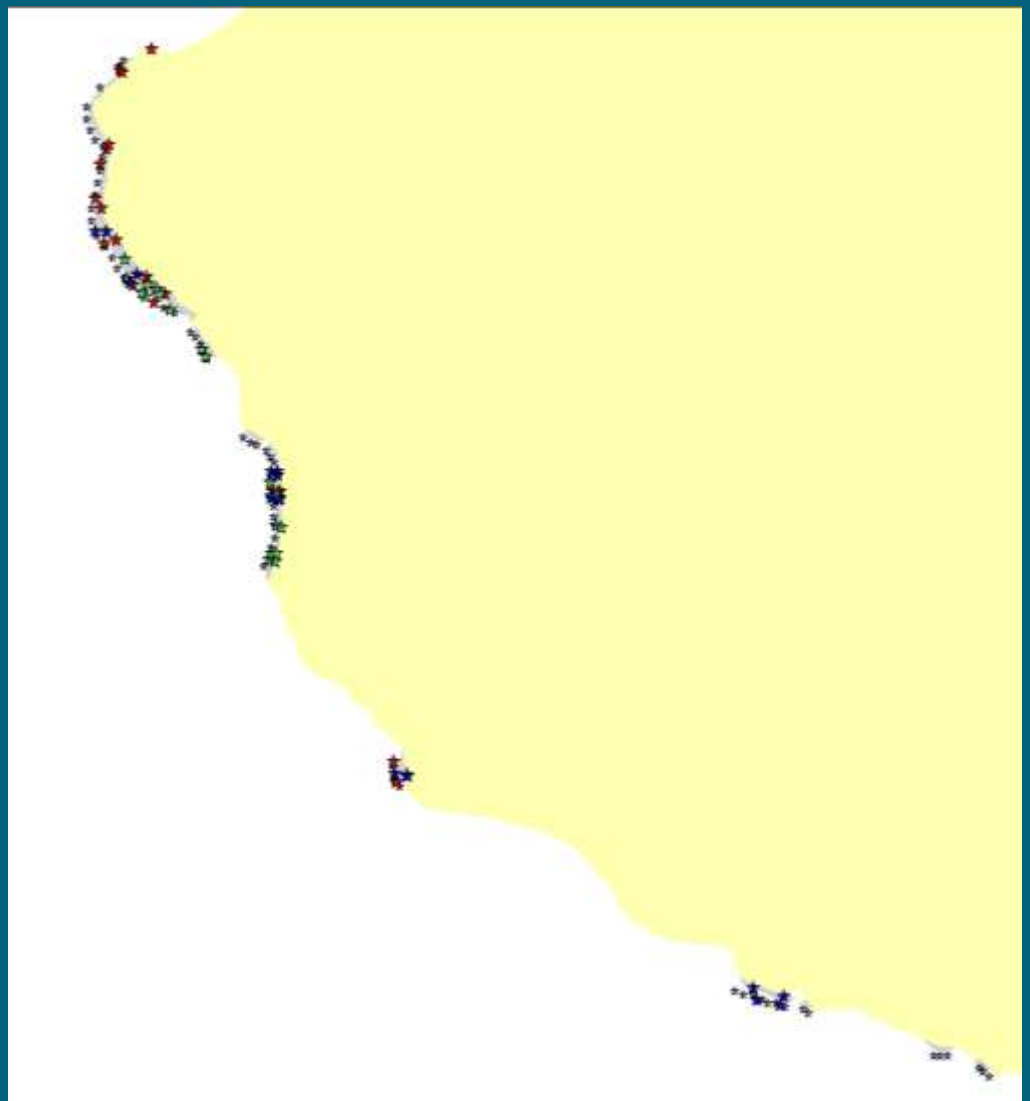
Permanent monitoring :

High Level of expertise : GCRMN (Coral, Fish, benthic fauna and flora sessile and mobile) : 12 sites (24 stations) (+ 2 sites in no coral reef habitat) (+6 sites quadrat MPA)

Medium Level of expertise : Reef Check (Coral, Fish, benthic fauna and flora sessile and mobile) : 8 sites

Broad scale monitoring

Outer reef slopes: medium level (MSA : sessile benthic fauna and flora) : 64 sites



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Coral reef monitoring: different scale and expertise levels

1. Reunion

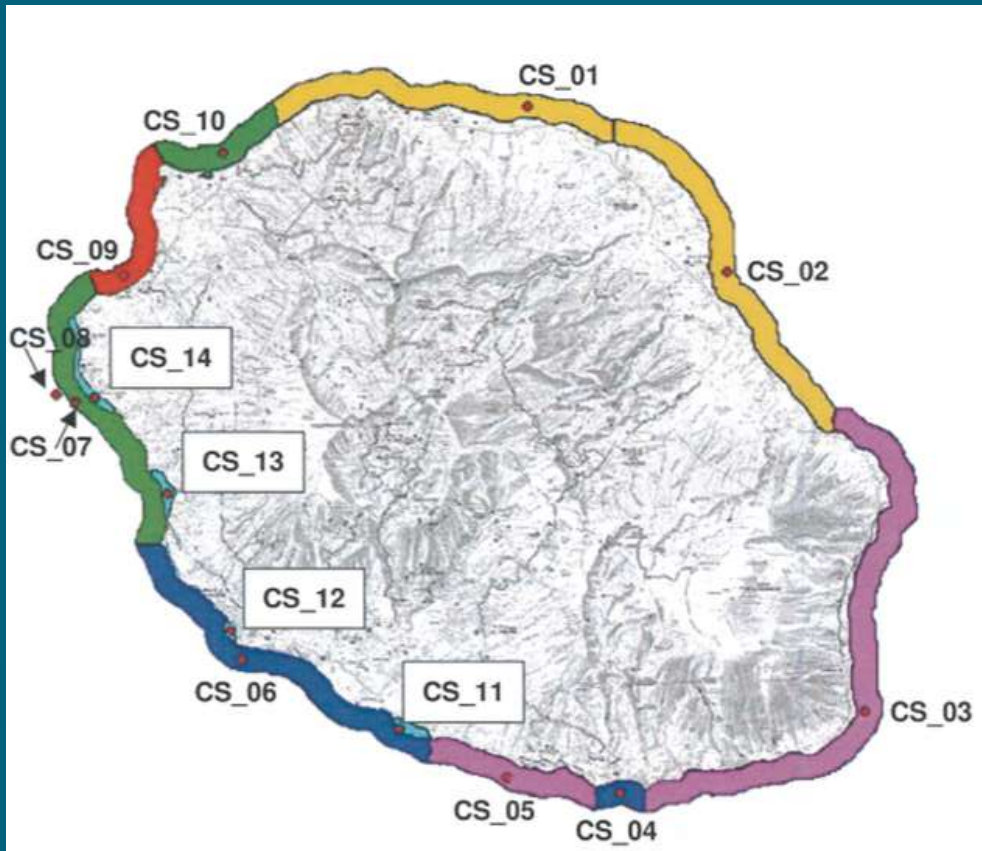
Water and sediment (EU directive framework)

Water Quality

High Level of expertise: T (adding data logger), S, nutrients, pH, Chla, O2, Metal, chemical, products… : 10 sites (4 in reefs)

Sediment

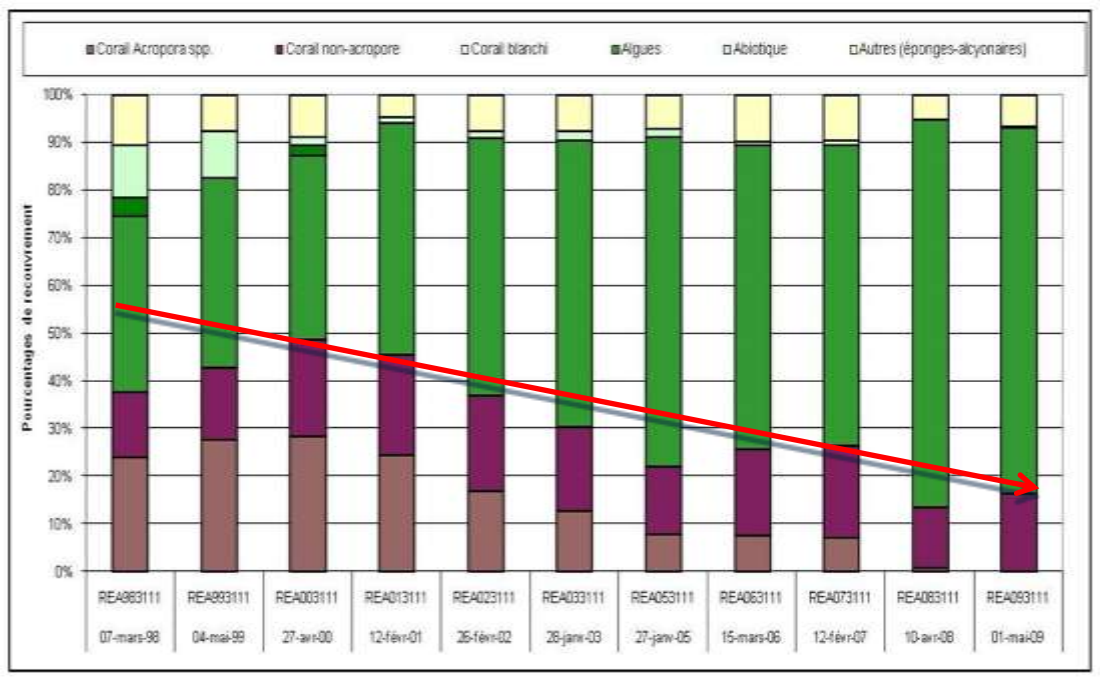
High Level of expertise : Particles size (silt), organic matter, N, P, fauna community, ….: still in progress

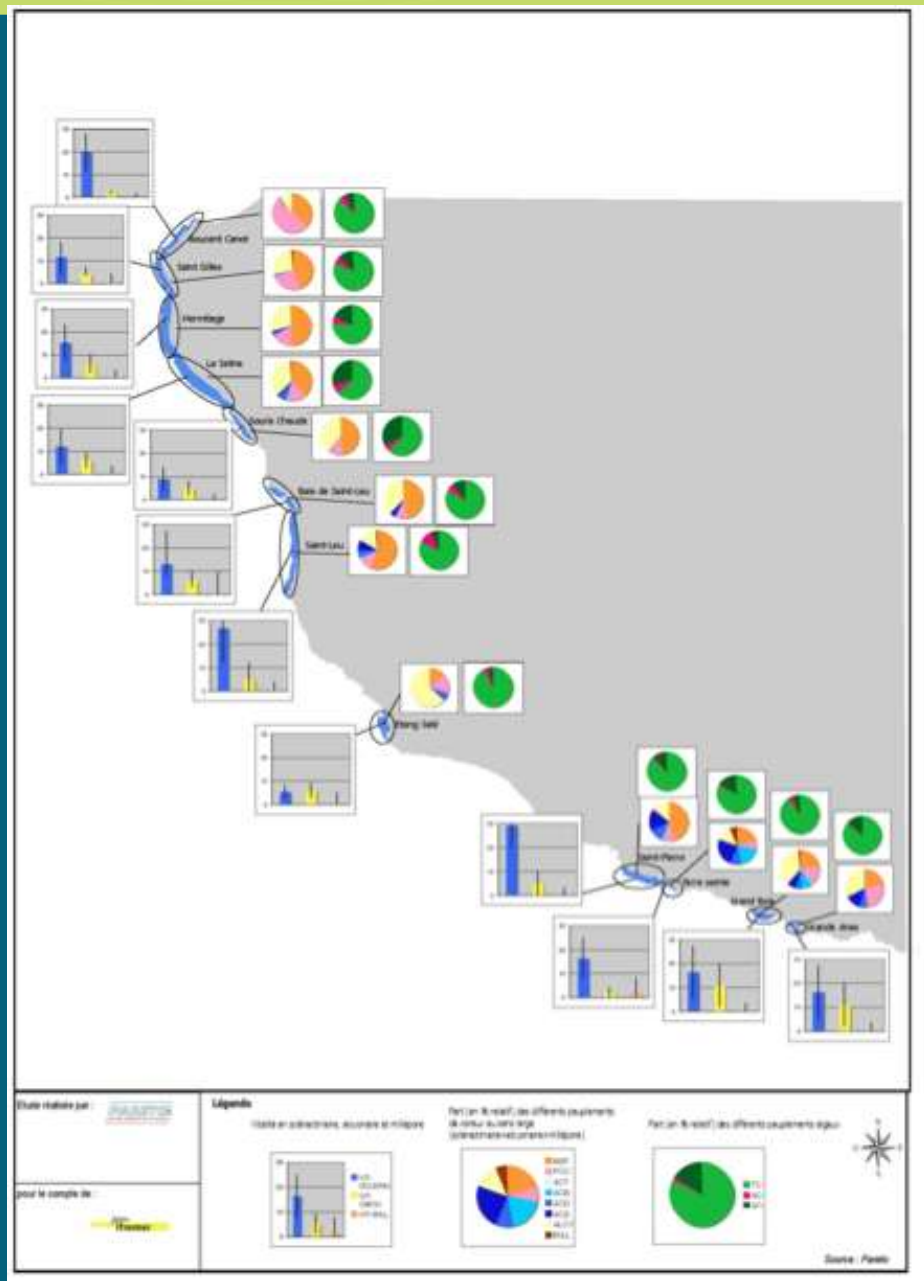


Coral reef monitoring: status 2011

1. Reunion

- **Since 1998**: decrease of coral cover for outer reef slopes (now approx : 20%)
- **Reef slopes in 2010**: low coral cover
- **Reef flats:** Heterogeneous coral cover





Coral reef monitoring: different scale and expertise levels

2. Mayotte

Fauna and flora

Permanent Monitoring :

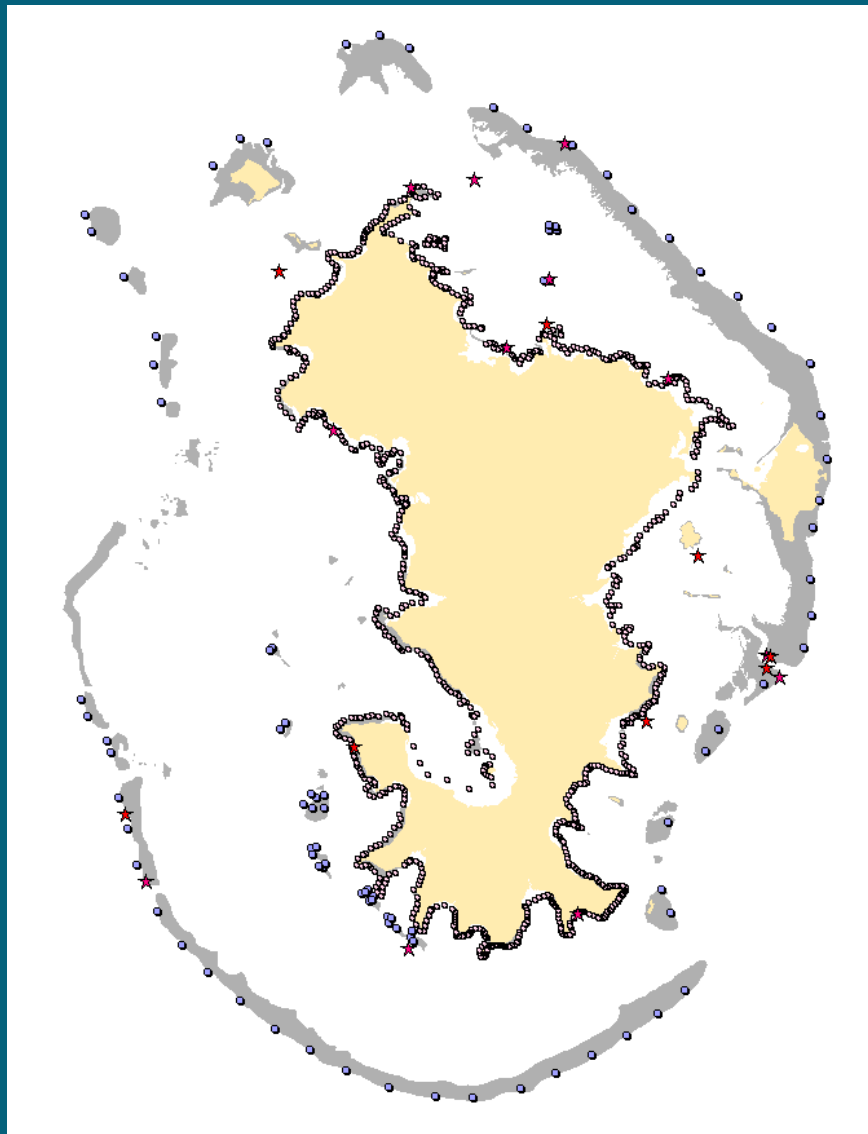
High Level of expertise : GCRMN (Coral, Fish, benthic fauna and flora sessile and mobile) : 12 sites (+4 sites for Bouzi MPA)

Medium Level of expertise : Reef Check (Coral, Fish, benthic fauna and flora sessile and mobile) : 8 sites

Broad scale monitoring

Fringing reefs : Low level (Manta Tow : coral cover)

Inner and barrier reefs : medium level (MSA : sessile benthic fauna and flora) : 120 sites



Coral reef monitoring: different scale and expertise levels

2. Mayotte

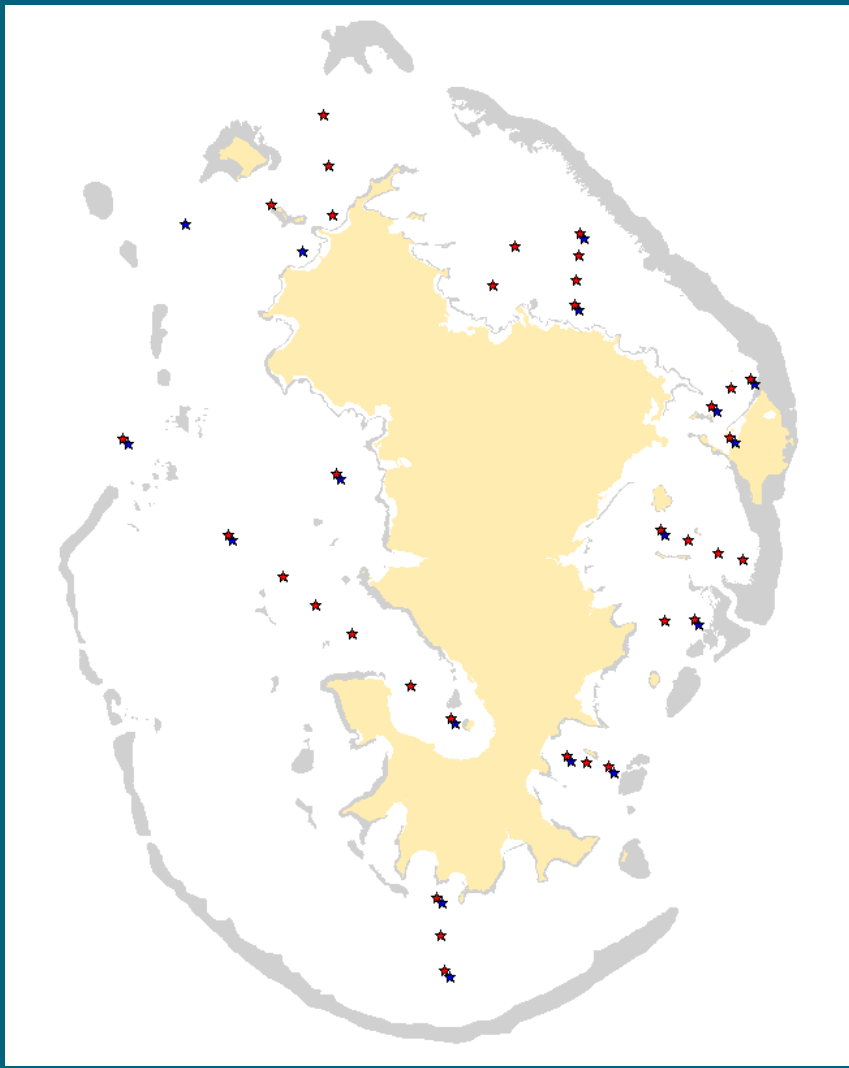
Water and sediment (EU directive

Water :

High Level of expertise : T (adding data logger), S, nutrients, pH, Chla, O2, Metal, chemical products,… : 16 sites

Sediment

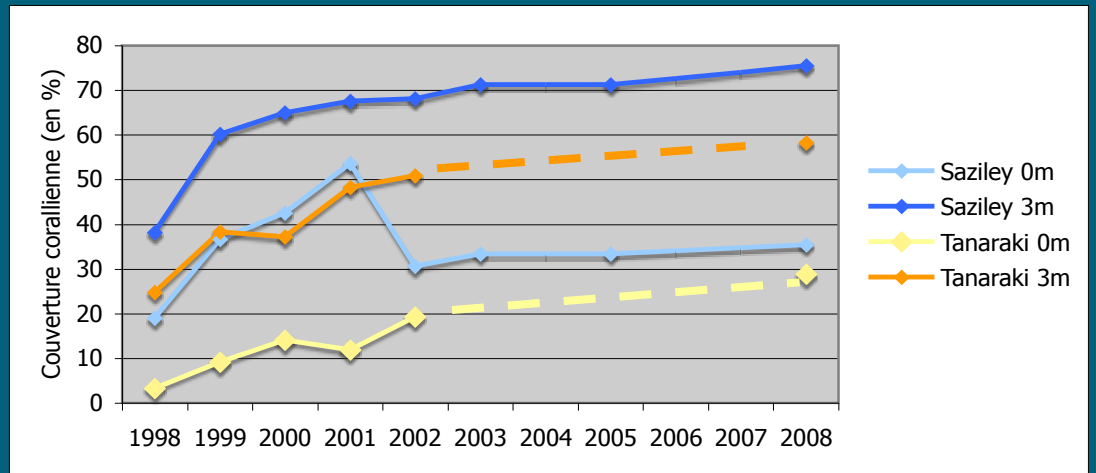
High Level of expertise : Particles size (silt), organic matter, N, P, fauna community, ….: 34 sites

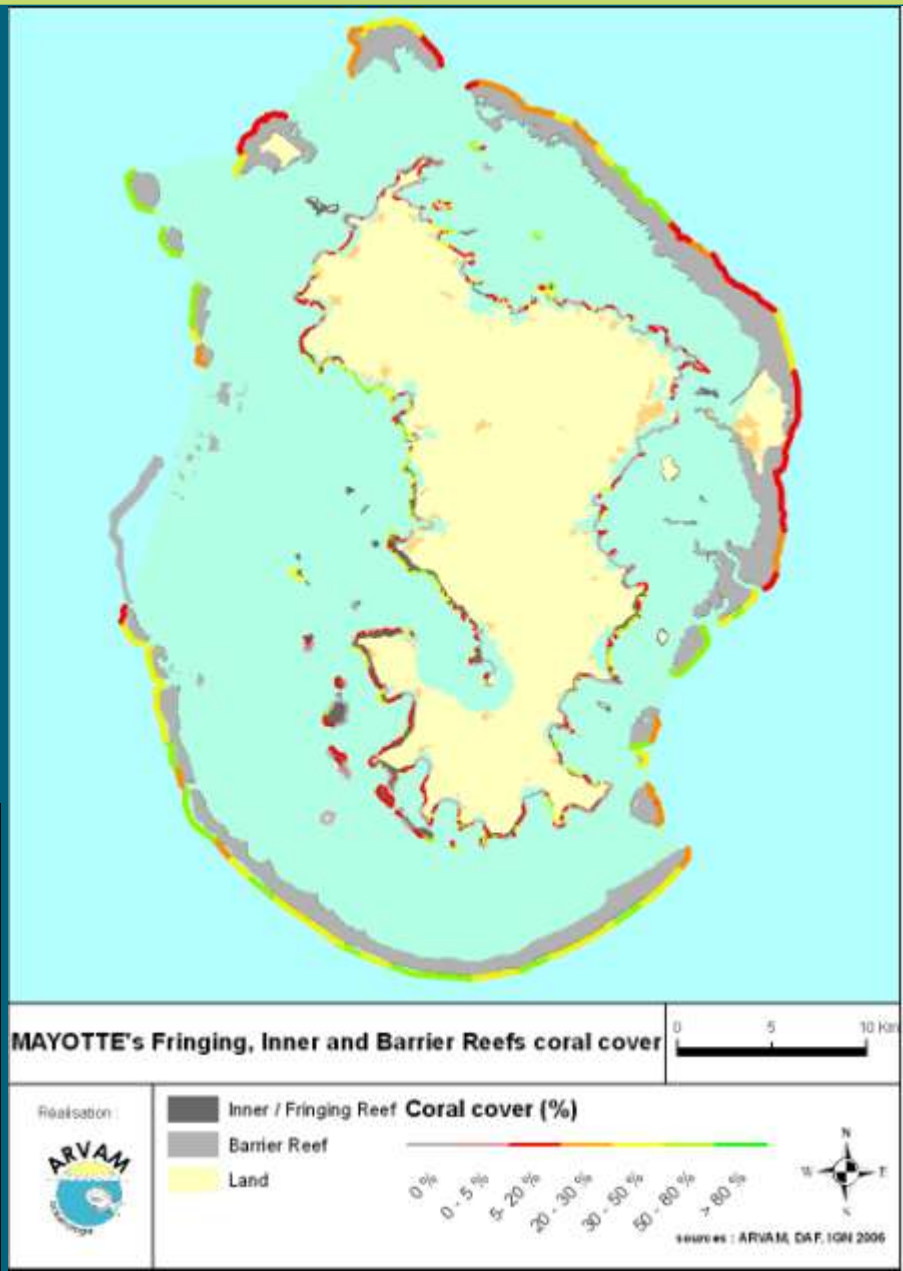


Coral reef monitoring: 2011 status

2. Mayotte

- **Since 1989** : Decrease of fringing reef coral cover
- **Since 1998** : Resistance/resilience seems depend of type of reef.
- **Barrier reef :** Good coral cover (good resilience from 1998) in 2006
- **BUT in 2010 :** massive bleaching (probably also occurred in 2011 with an increasing of 2010 bleaching mortality effect).





Monitoring of coral reef : different scale and expertise level

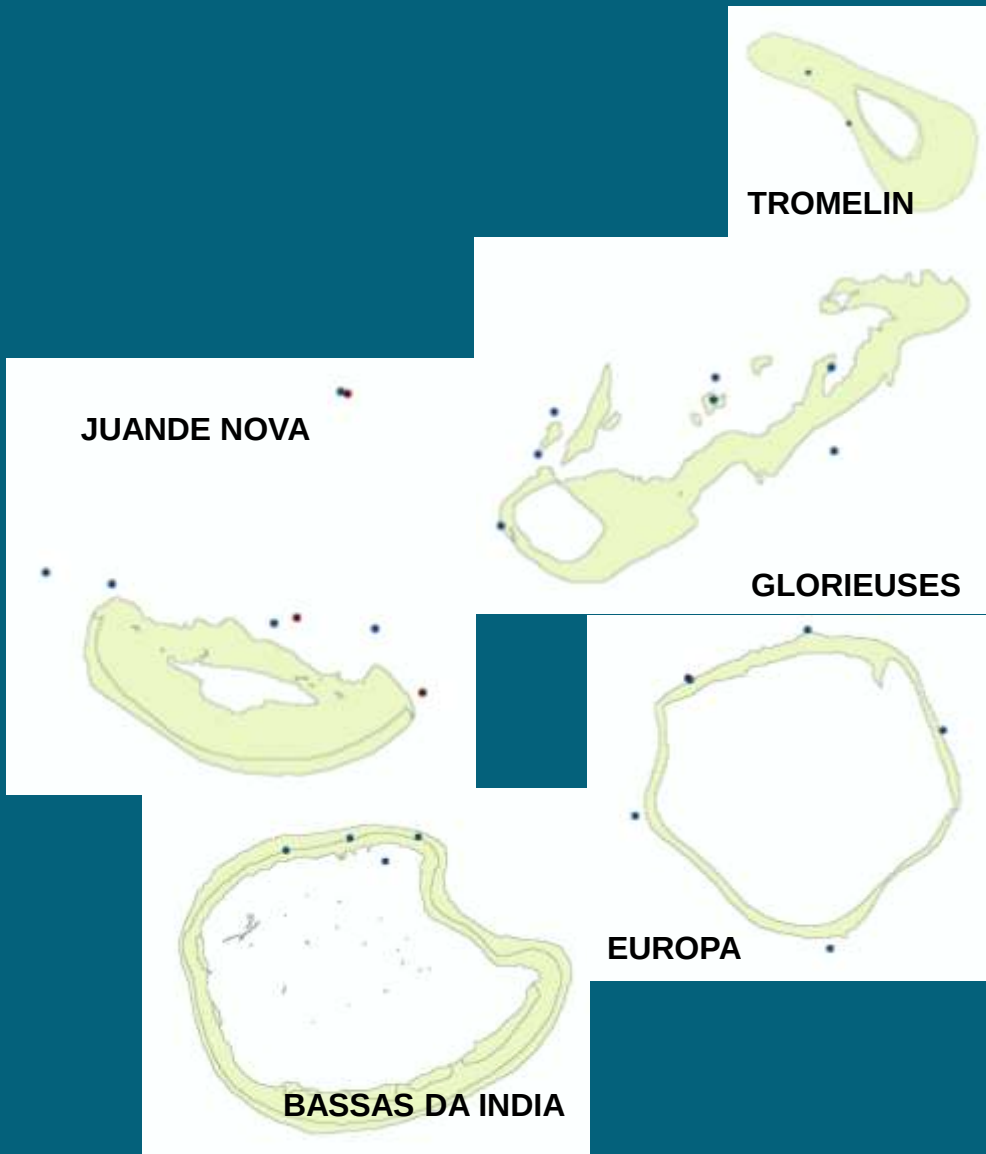
3. Iles Eparses

Fauna and flora

Station Monitoring (Program RECOSUR and now BIORECIE) :

High Level of expertise : GCRMN (Coral, Fish, benthic fauna and flora sessile and mobile) : 19 sites

Medium Level of expertise : Reef Check (Coral, Fish, benthic fauna and flora sessile and mobile) : 4 sites



TAAF

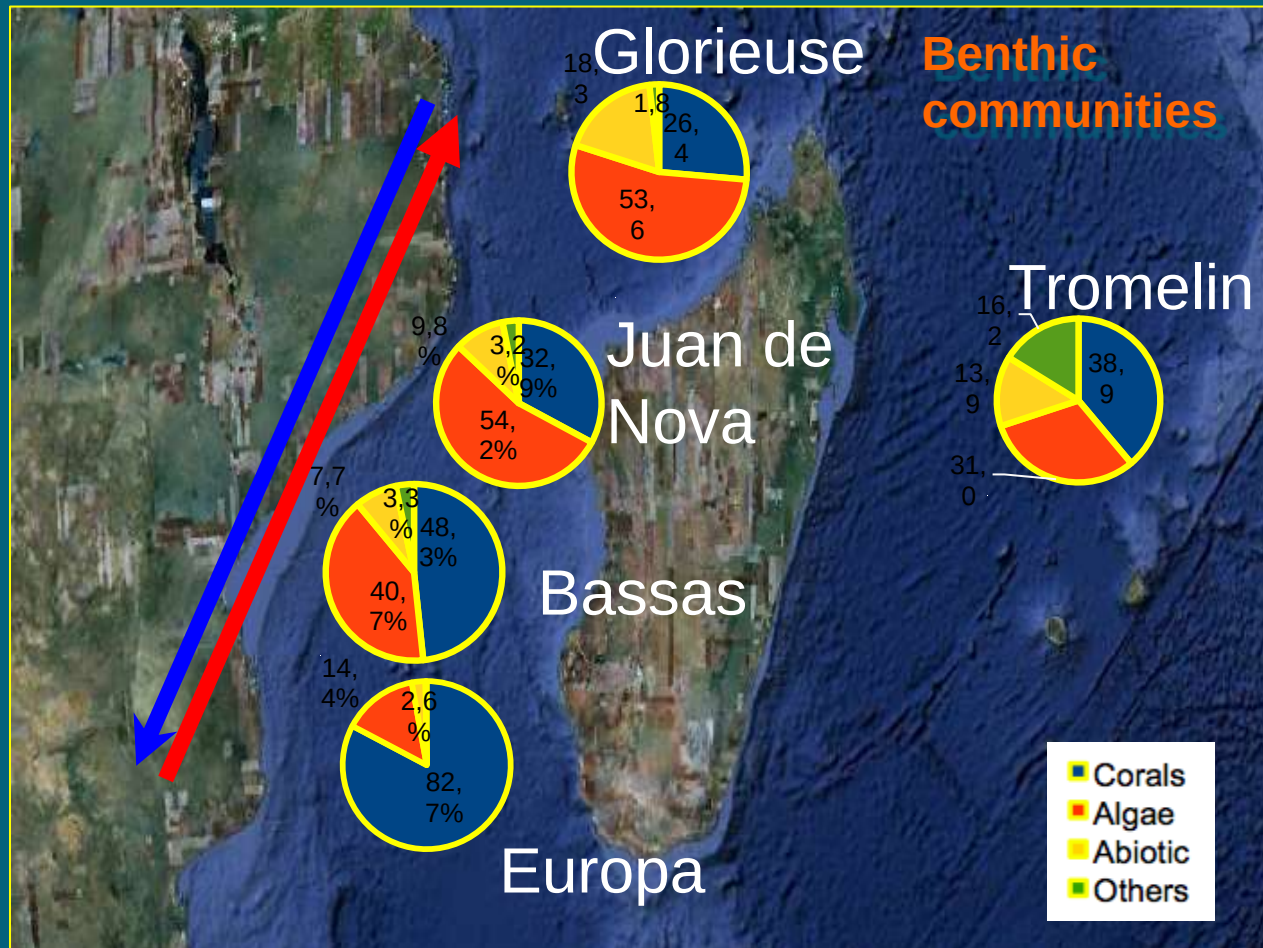
Monitoring of coral reef : status of coral reef

3. Iles Eparses

Program BIORECIE (IRD)

- Gradient along the Mozambic channel
- Coral cover Glorieuses - → Europa+
- Differences could be due to their geomorphology, isolation and thermal stress
- Good recovery at Juan de Nova (2004-2011)

Source: CHABANET et al., 2011



Conclusions & Perspectives.

Monitoring is well established for ten years in Mayotte and Réunion, in progress in Iles Eparses.

Nb of stations	Expert	Intermediate	Other	
Mayotte	40	8	120	168
Iles Eparses	19	4		23
Réunion	32	8	64	104
	91	**20**	**184**	295

Target groups are:
- **Fixed benthos**
- **Fishes**
- **Invertebrates**

Environmental associated data such as Temperature (cf coral bleaching), physico-chemical parameters are now collected on some stations to provide help for decision making.