

MareFrame



Scientific Conference “Advances in Ecosystem-based Fisheries Management”

14th December 2017
Brussels, Belgium

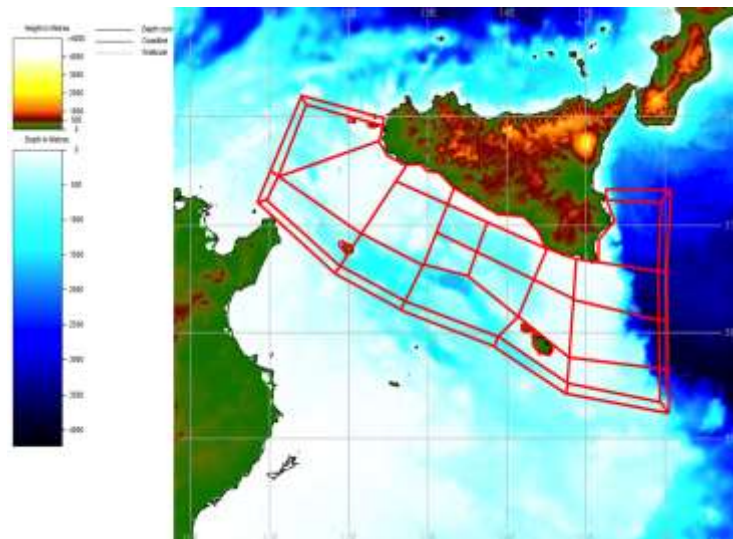


This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no. 611571

Decision support disentangles the multiple EBFM goals of the mixed shrimp and hake fishery in the Strait of Sicily

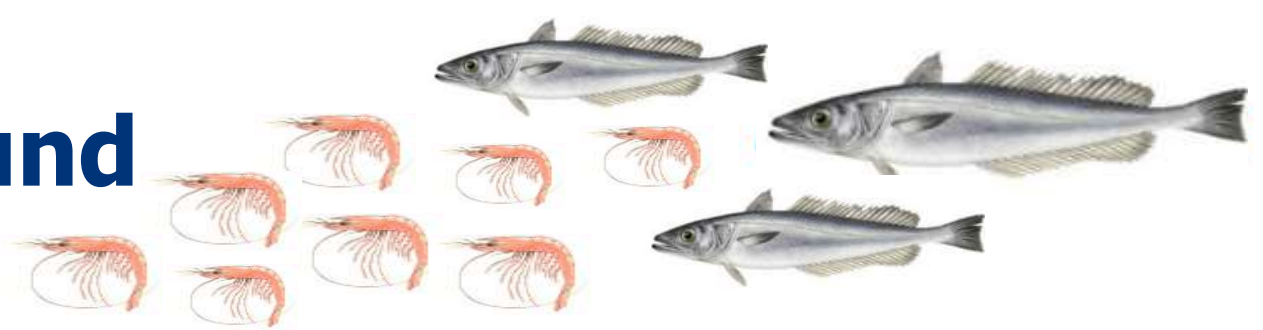
Mika Rahikainen*, Matteo Sinerchia, Marco Enea, Fabio Fiorentino, Marta Ballesteros, and Francesco Colloca

[*mika.rahikainen@helsinki.fi](mailto:mika.rahikainen@helsinki.fi), University of Helsinki, FINLAND



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no. 613571

Background



- **deep-water rose shrimp and hake fished in a mixture**
 - trophic link between shrimp and hake
 - red mullets, common pandora, and cephalopods have a role in the landing portfolio
- **multi-national multi-fleet fishery**
 - Italy, Malta & non-EU Tunisia, Libya, Egypt (enforcement)
 - a multiannual management plan for BT in 2016 by the General Fisheries Commission for the Mediterranean (GFCM)
- **habitat heterogeneity and biodiversity hot spots**



Acknowledged problems

- overfishing of the main commercial stocks
- high fishing mortality of juvenile hake and shrimp
- profitability of the bottom trawl fleet low



-  F_{MSY} shrimp versus F_{MSY}  hake

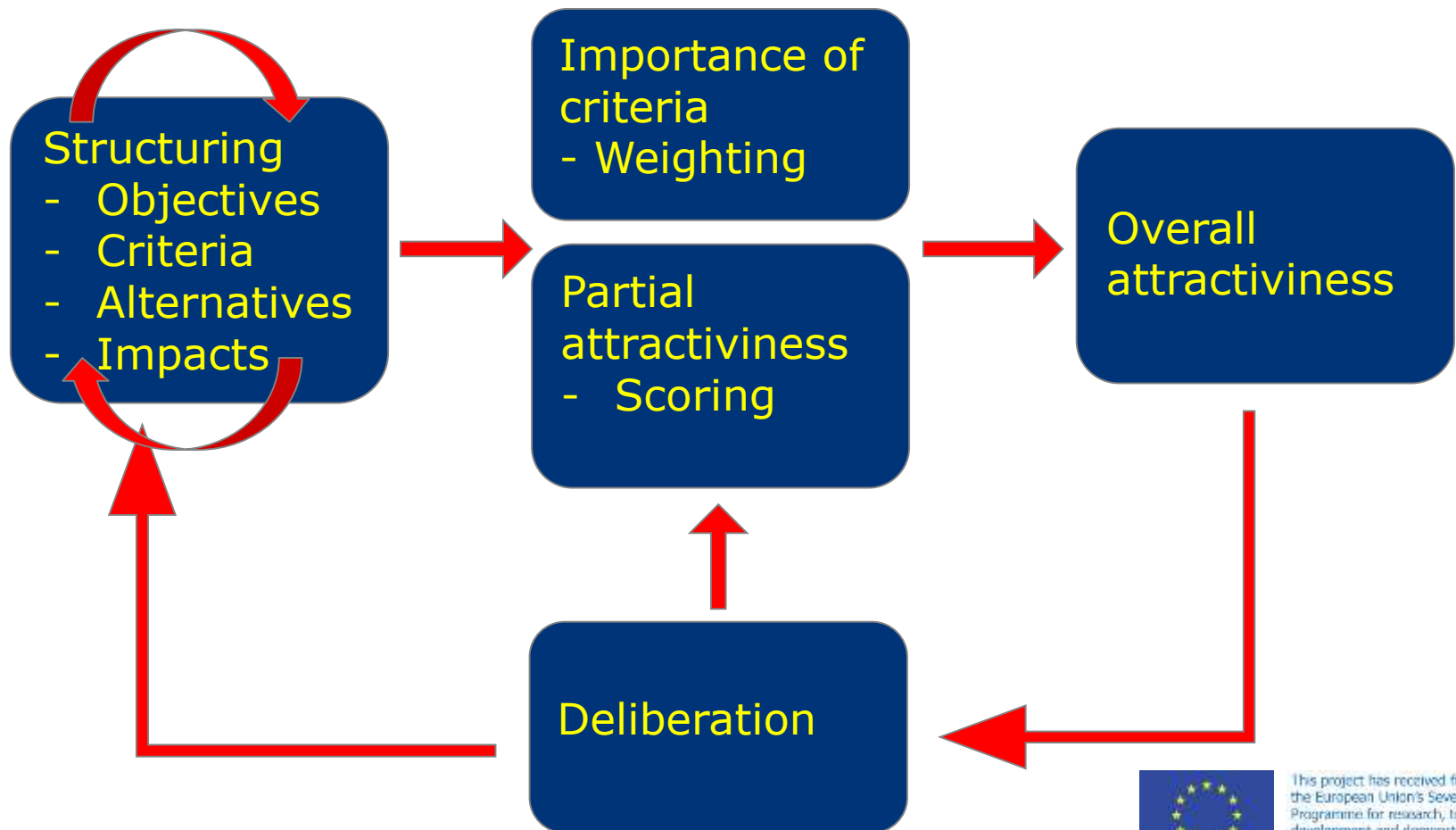
- Effort reduction 5%
- hake stock declines

- 25%
- (shrimp) fishery suffers





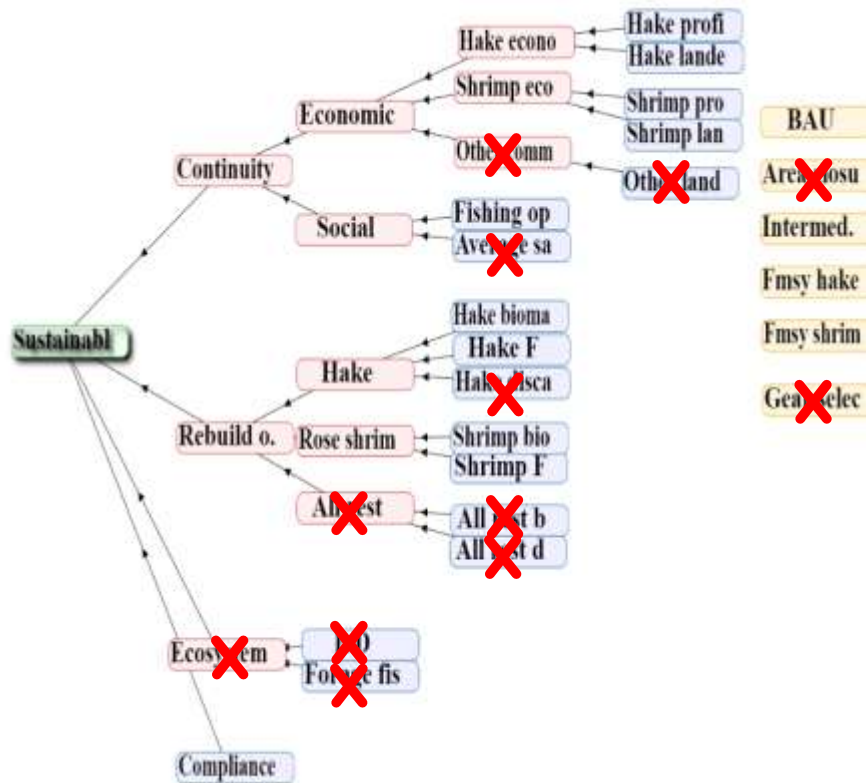
Decision support process





Decision model

- Objectives hierarchy



- ecosystem models

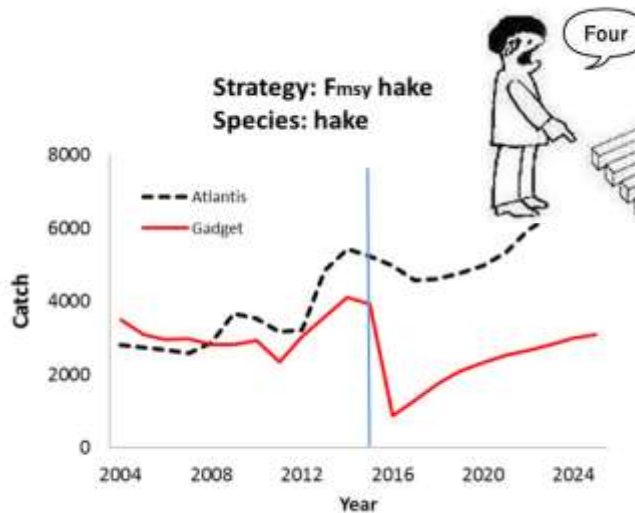
- Atlantis
- Gadget



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no. 613571



Challenges - science



- **undermines trust in science & process**
- **opportunity to acknowledge uncertainty**





Challenges – co-creation

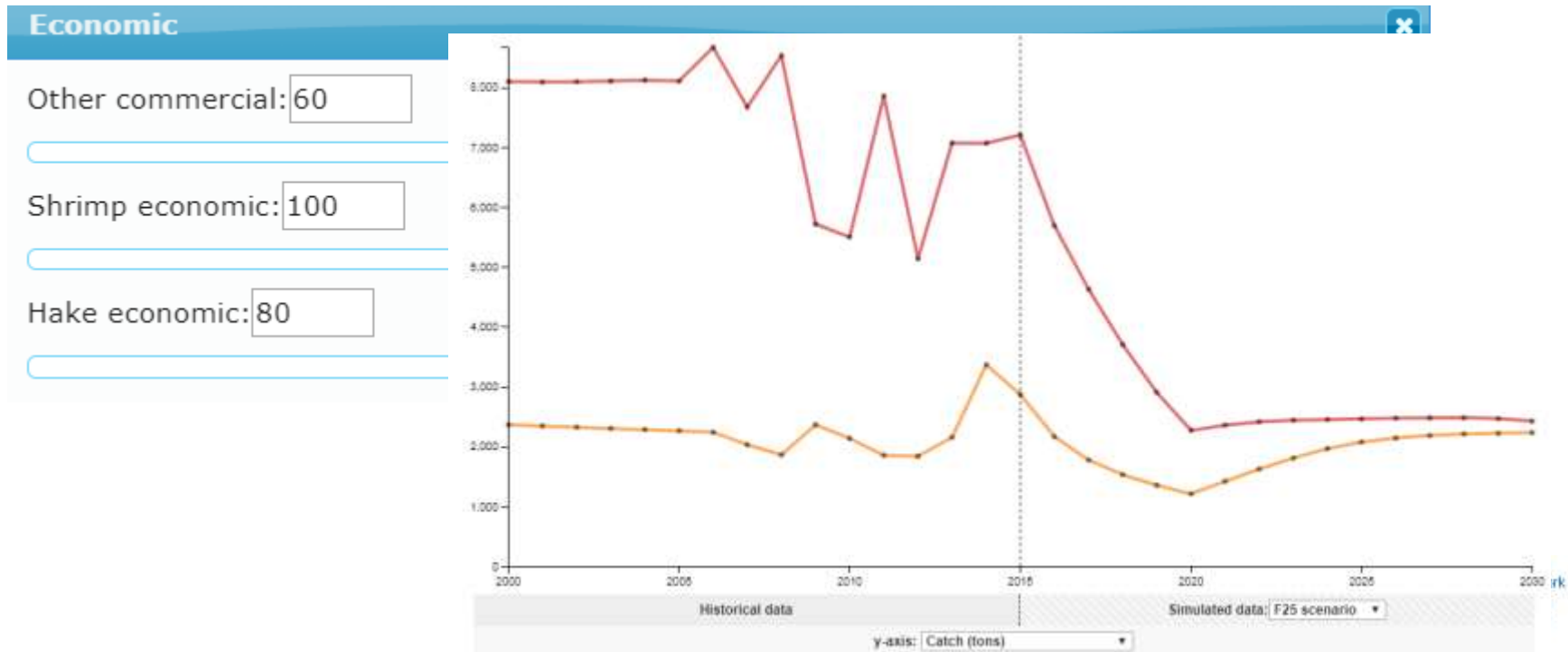
- **Maintaining stakeholder motivation during the project and the participatory workshops**
- **Cognitive load may become too high for lay people**
- **Pragmatically impossible to validate whether the assigned weights really reflect stakeholders true opinions**





Challenges – co-creation

- **Weights provided by stakeholders might be general, not for this specific case**





Challenges – in common

- Indicators might not indicate the real outcome of a management choice



Fishing opportunities

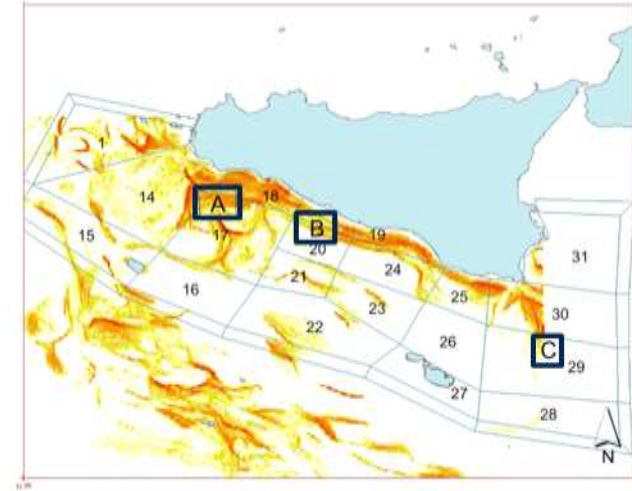
Type of Weighting Method:

Value Function

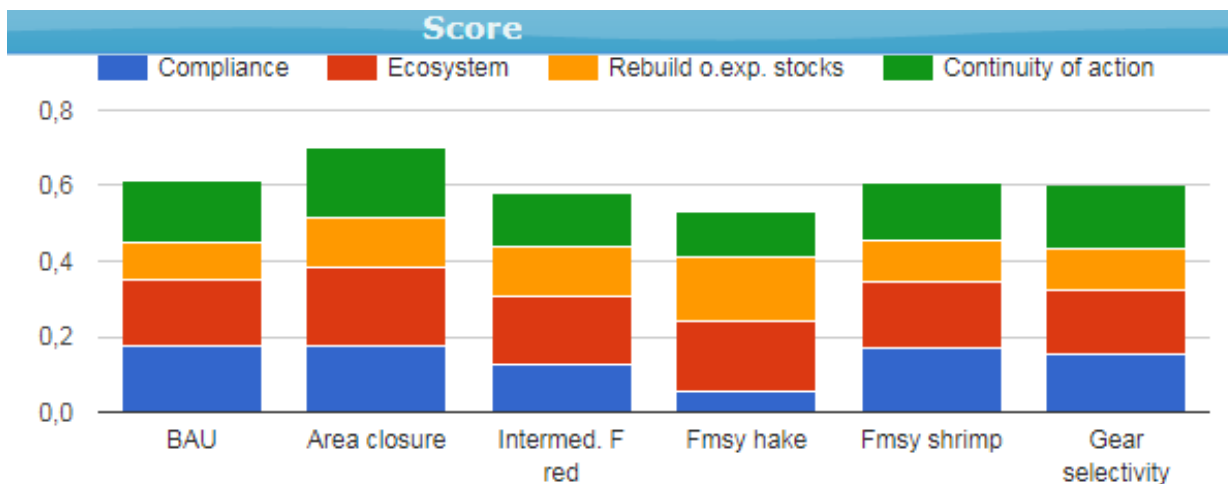




Results



- **If Atlantis is used as the scientific base of knowledge**
- **management based on fisheries restricted areas would perform best for 2020 and 2030**

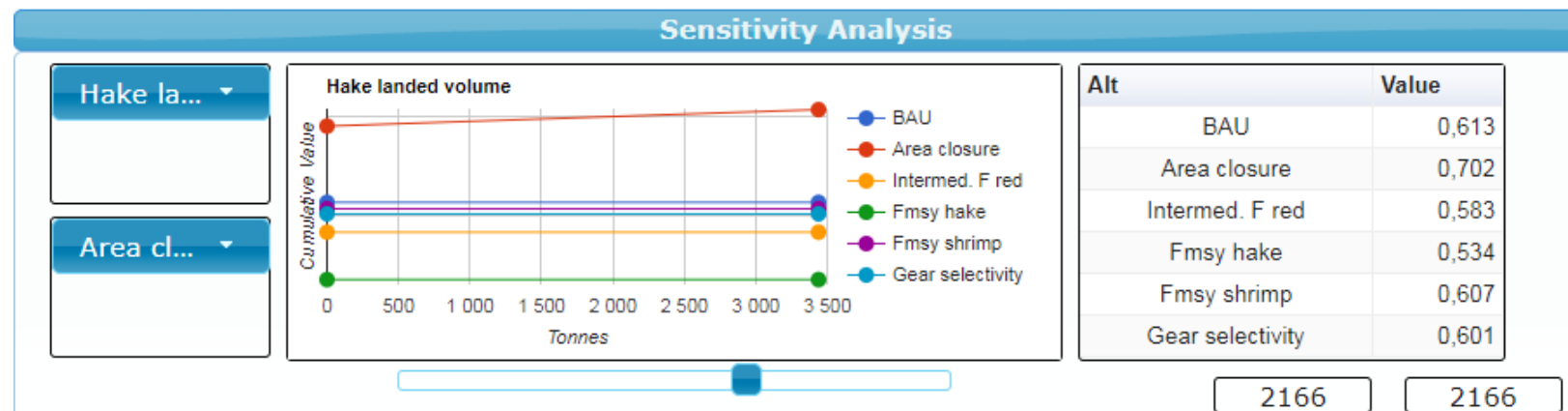
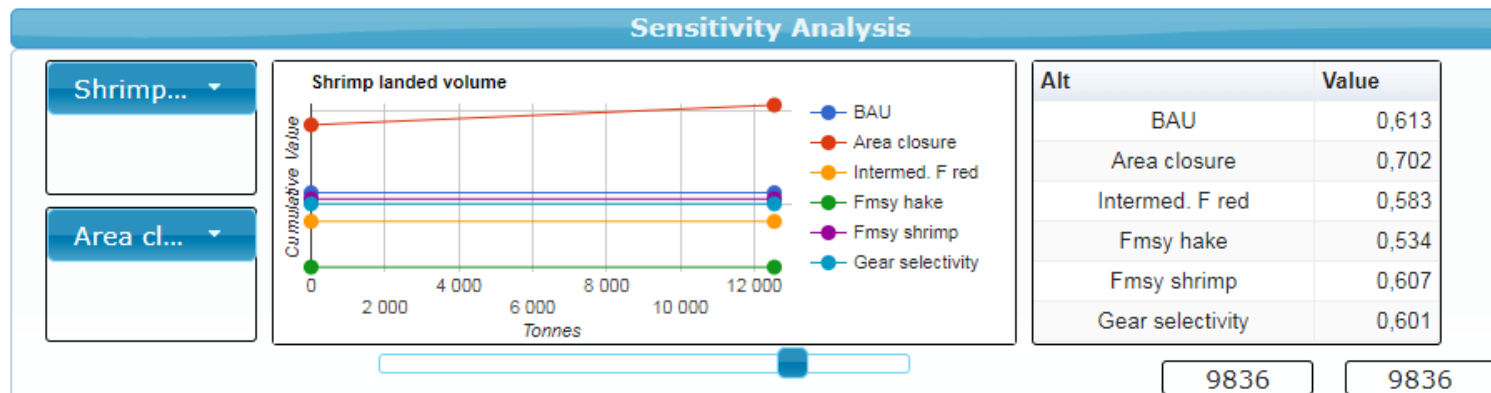


This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no. 613571



Results

- ... and uncertainty about the future landing will not change the rank of the decisions.





Lessons learnt

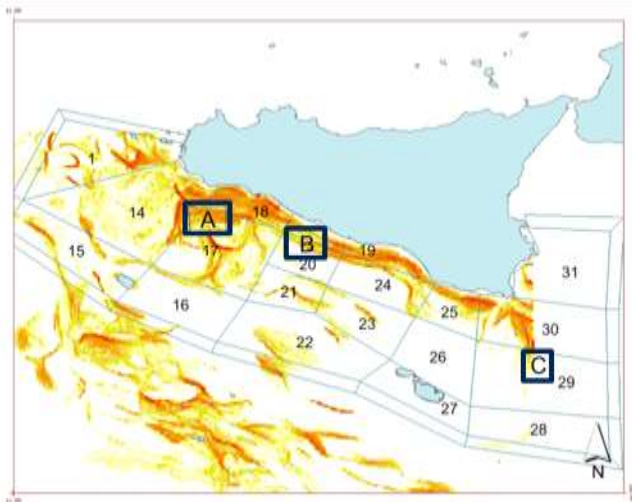
- **Insufficient attention to full suite of performance indicators (esp. social/economic and governance aspects).**
- **It is necessary to reduce the number of indicators and improve the quality of the remaining ones.**
- **Cumulative understanding and stakeholder buy-in was achieved.**





After MareFrame

- **Fishing restricted area strategy performs best but potentially can be improved.**
- **The DSF is planned to be showcased during the GFCM and FAO management meetings in 2018.**



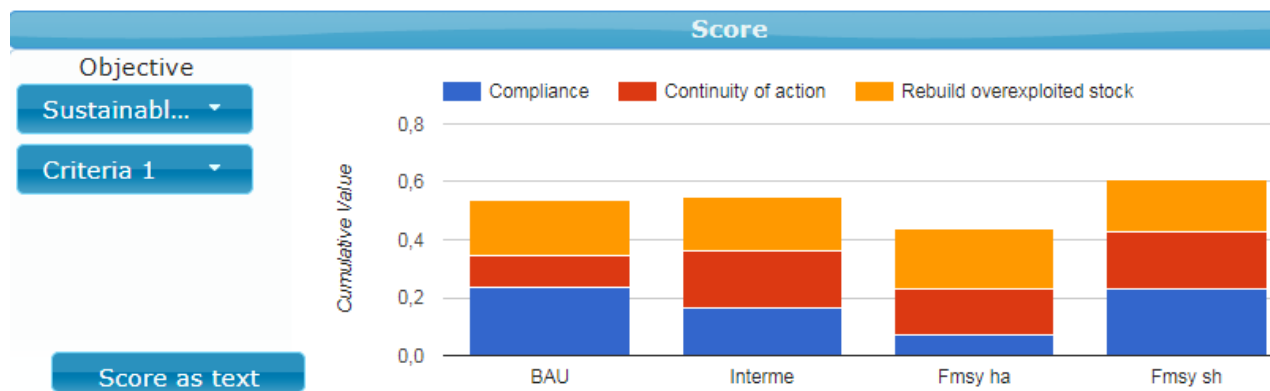
Strait of Sicily		Management scenario										
		BAU	F _{msy} hake	F _{msy} shrimp	Intermediate F reduction	Area closure	Gear selection					
Compliance/management	perfect compliance							No deviance from the control rule (TAC not e				
	very good compliance	0.5		0.4		0.5		Deviance max 10% from the control rule (TA				
	good compliance	0.5		0.6	0.4	0.5	1	Deviance max 20% from the control rule (TA				
	moderate compliance				0.6			Deviance max 30% from the control rule (TA				
	poor compliance		1					Deviance max 50% from the control rule (TA				
		Relevant control: TAD (total allowable days)	Relevant control: TAD (total allowable days)	Relevant control: TAD (total allowable days)	Relevant control: TAD (total allowable days)	Relevant control: area	Relevant control: sorting grid in the trawl					





Results

- **If Gadget is used as the scientific base of knowledge**
- **management based on F_{MSY} shrimp would perform best for 2020**



Selected management plan scenarios

BAU

Effort reduction

F → F _{MSY} by 2020 for DPS (low reduction)	5%
intermediate	15%
F → F _{MSY} by 2020 for HKE (high reduction)	25%

Fisheries restricted areas (3 areas)

Improved gear selectivity

Application of social economics evaluation of management scenarios

