



SPATIAL ZONING AND FISHERY RIGHTS: A REPORT ON 20 YEARS EXPERIENCE IN CHILE

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**WORKSHOP: IMPACTS OF CLIMATE, FISHERY AND
GOVERNANCE IN LATIN AMERICAN SHELLFISHES**

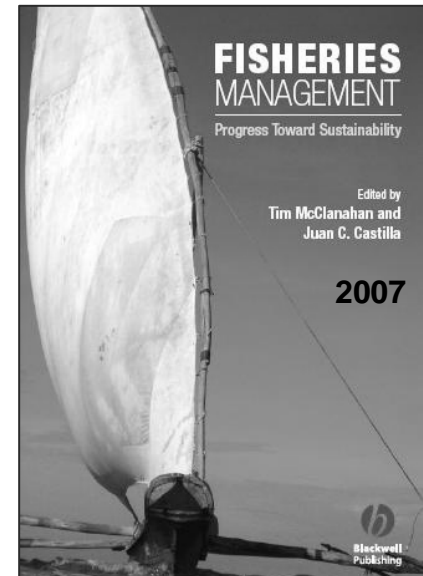
MALDONADO, URUGUAY 2011

Outline of presentation

- **Beyond Fishery & the Commons**
- **The Six Key Major Governance Rules in the 1991 Chilean Fishery Law**
- **Artisan versus Industrial Fleets: Definitions, Fishery Rights and Ocean Zoning**
- **A Conservation-Fishery Tool Box**
- **Fisheries in Chile, results after 20 years: What is going on?**

FISHERY, THE COMMONS AND GOVERNANCE

1. Fisheries management and sustainability depend on *Governance of Humans & Environments*: interactions among and between government, society, markets and knowledge on the environment.
2. Fishery open access management policies do not work and alternative restrictive access legal action (or collective action) is more likely to occur and be effective if it is agreement with self-interest of fishers.
3. Compliance with fishery legislation, for instance access privileges (i.e.. local community property rights, large fishery collective property rights, zoning of the ocean) is more likely to occur and be effective if it is in agreement with self-interest of fishers.
In a nut shell: 1, 2, 3...Fishery problems are more fishers than fish problems
4. BUT, fishery problems are not exclusively fishers problems but also fish (bio-environmental) problems. Therefore, if early in the establishment of *Fishery Governance Mechanisms* the process is accompany by SCIENCE (basic and applied), also is more likely to occur and be effective



FISHERIES: BEYOND THE COMMONS

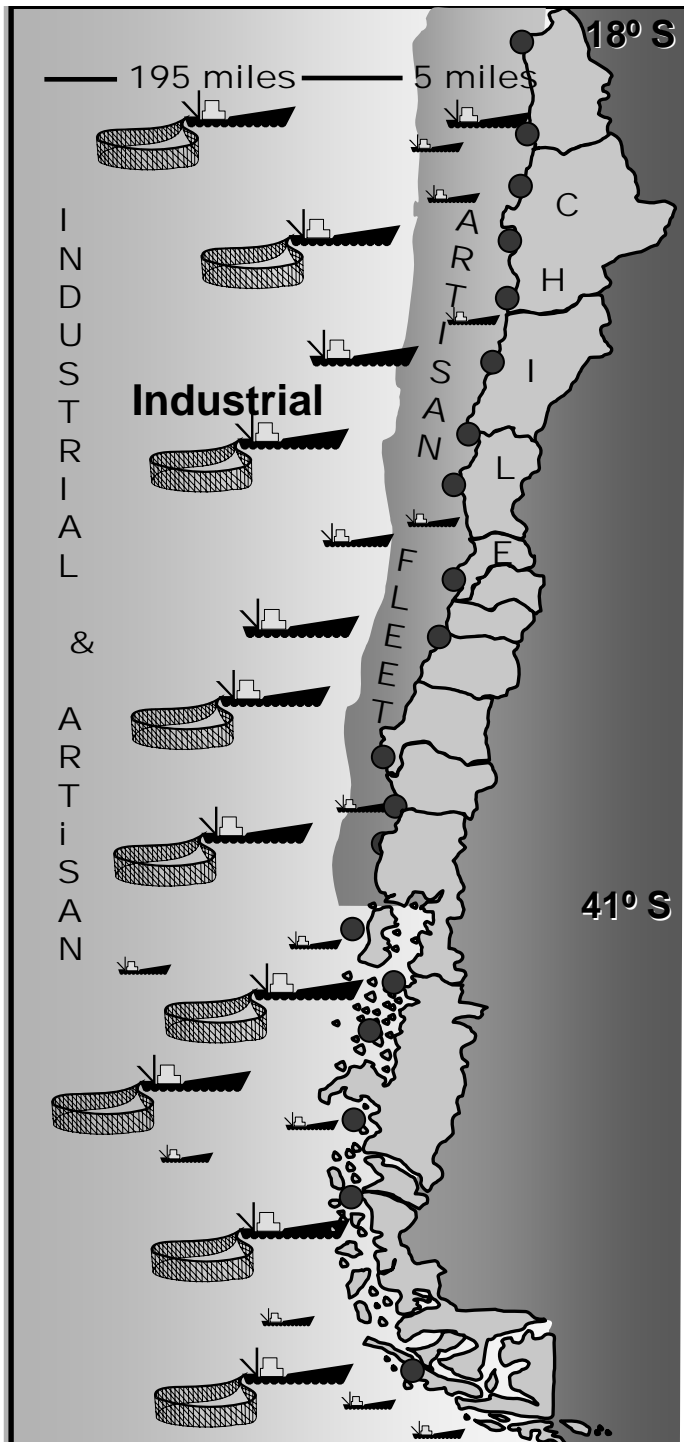
**SCIENTIFIC KNOWLEDGE, FISHERY CRISIS
AND POLITICAL CHANGE AS WINDOW OF
OPPORTUNITY**



**GOVERNANCE, COLLECTIVE AND LEGAL
ACTIONS**

ACCESS PRIVILEGES AND REGULATIONS

***SPATIAL ACCESS (OCEAN ZONING)
FISHERY EXCLUSIVE RIGHTS
QUOTA ALLOCATION TO USERS
GOVERNMENT - STATE PRIVILEGES***



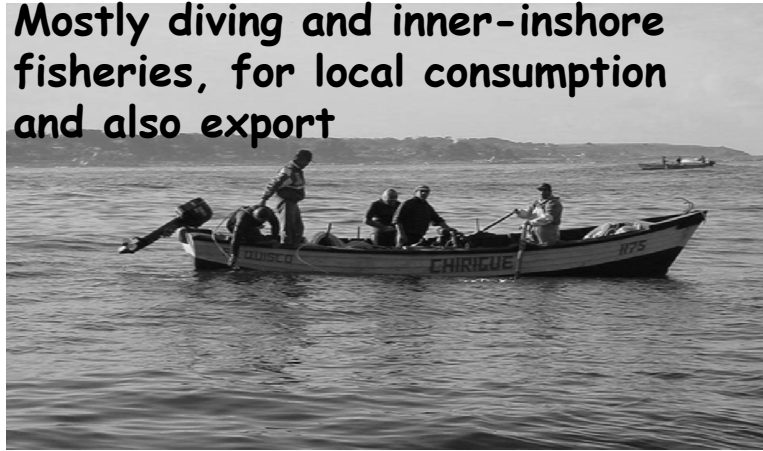
1991 CHILEAN FISHERY LEGISLATION 6 KEY GOVERNANCE RULES

1. Definition of 2 fleets and Official Registers:
 - (a) Artisan (small and mid-scale) as A UNIT
 - (b) Industrial (large) vessels over 18 m length and/or 50 gross tons, as A UNIT.
- ✓ 2. First 5 miles (between 18°S to 41°S and around oceanic islands: ca. 30 000 km²) for the EXCLUSIVE USE of the artisan fishery fleet unit (A MACRO-TURF for all fisheries)
3. Territorial User Rights for Fisheries of benthic Resources (Benthic-TURFs) resources allocated exclusively to local organized communities as Management and Exploitation Areas for Benthic Resources (MEABRs or MICRO-TURFs for benthic) ●
4. For 10 Fully Exploited species (sardine, anchovy, jack mackerel, shrimps) management is based on the allocation of QUOTAS. There exist no quota transferability inside the artisan fleet and very reduced transferability inside the industrial fleet
5. In above case, option for the government for public AUCTION of quotas: 5% each year to reach 50% of quota it was established (it was no used!)
6. December 2012 legislation will be revisited: ADAPTIVE

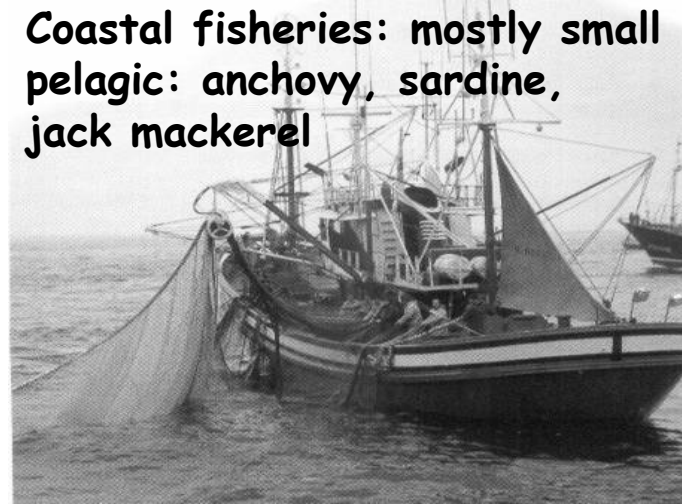
Castilla, 2010-Bull. Mar. Sci.; Gelcich et al., 2010-PNAS)

Artisan Fleet (< 18 m length or 50 gross tons)

Mostly diving and inner-inshore fisheries, for local consumption and also export



Coastal fisheries: mostly small pelagic: anchovy, sardine, jack mackerel



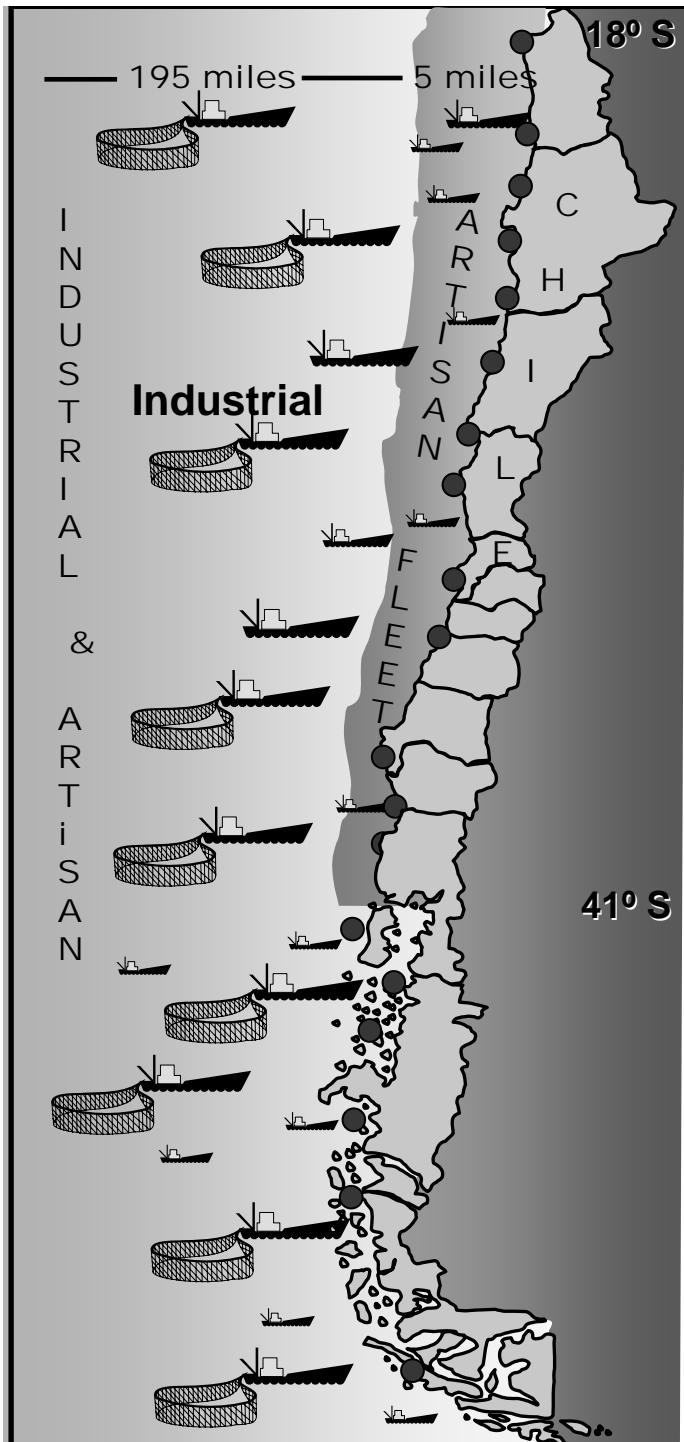
Industrial Fleet (> 18 m length or 50 gross tons)

Mid-water trawling (bottom trawling is very reduced)



Purse-seine (small pelagic)





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3. Territorial User Rights for Fisheries of Benthic Resources (Benthic-TURFs) resources allocated **EXCLUSIVELY** to local organized communities as Management and Exploitation Areas for Benthic Resources (MEABRs or MICRO-TURFs for benthic) ●
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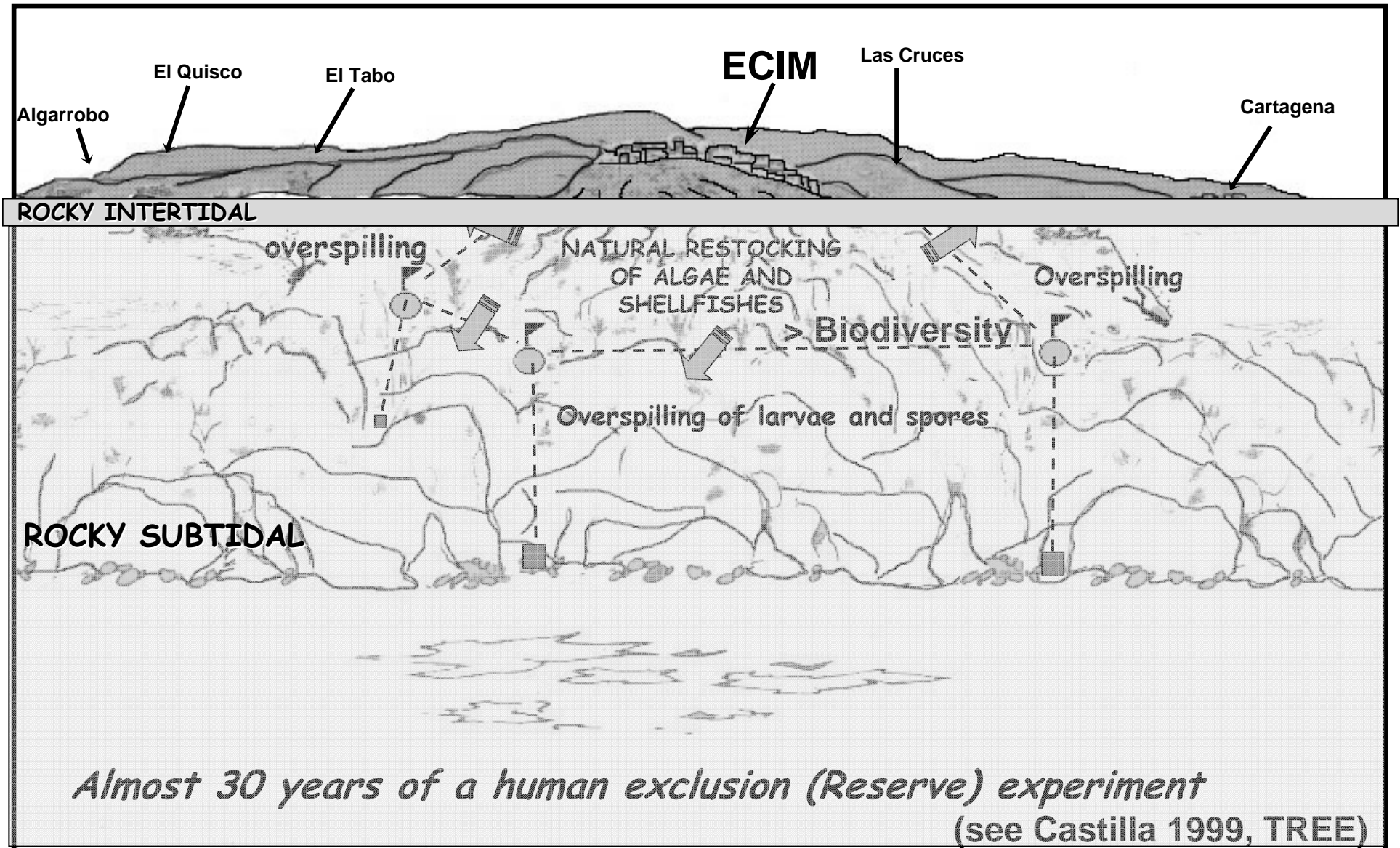
LAS CRUCES
Central Chile: 33° S

ECIM

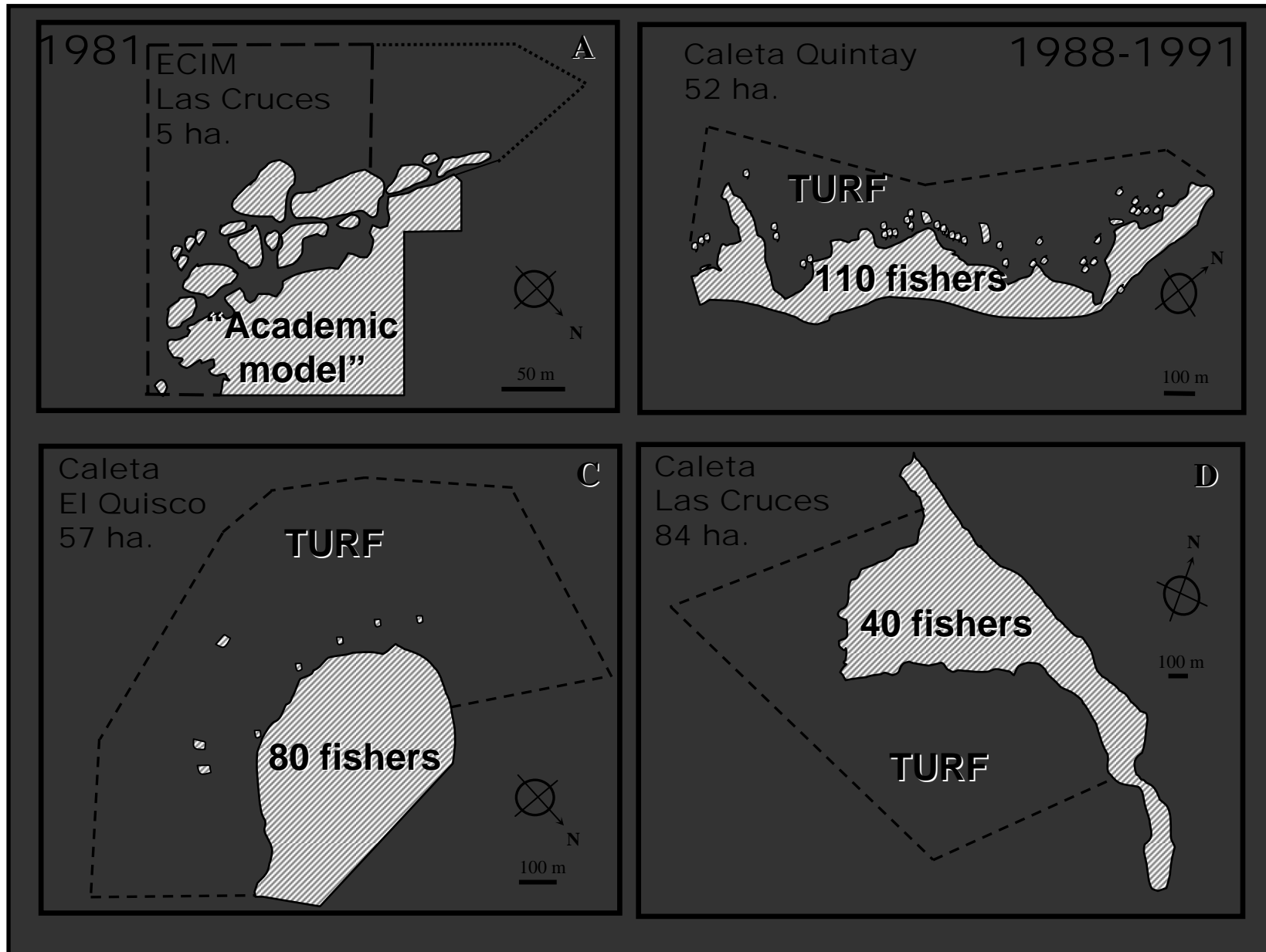
MARINE PROTECTED AREA

1 km

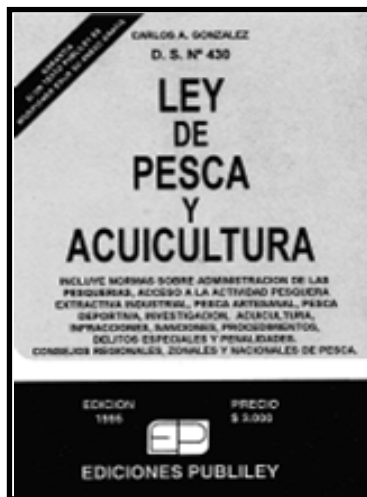
The Marine Reserve of Las Cruces, central Chile, as a model for conservation and coastal management



Pilot stage: 3 Experimental Management and Exploitation Areas
for Benthic Resources (MEABRs): Fisher communities exclusive access



1991



Artículo 48º.- En la franja costera de cinco millas marinas a que se refiere el artículo anterior, como en las aguas terrestres e interiores, además de las facultades generales de administración de los recursos hidrobiológicos mencionados en el Párrafo 1º del Título II, podrán establecerse, por decreto supremo del Ministerio, previos informes técnicos de la Subsecretaría y del Consejo Zonal de Pesca respectivo, las siguientes medidas o prohibiciones:

- a) Vedas extractivas por especie en un área determinada.
- b) Determinación de reservas marinas.
- c) Medidas para la instalación de colectores u otras formas de captación de semillas en bancos naturales de recursos hidrobiológicos, quedando igualmente prohibido efectuar actividades pesqueras extractivas en contravención a ellas.

d) Areas de manejo y explotación de recursos bentónicos, a las cuales podrán optar las organizaciones de pescadores artesanales legalmente constituidas.
Estas áreas serán entregadas por el Servicio, previa aprobación por parte de la Subsecretaría de un proyecto de manejo y explotación del área solicitada, a través de un convenio de uso, por un período

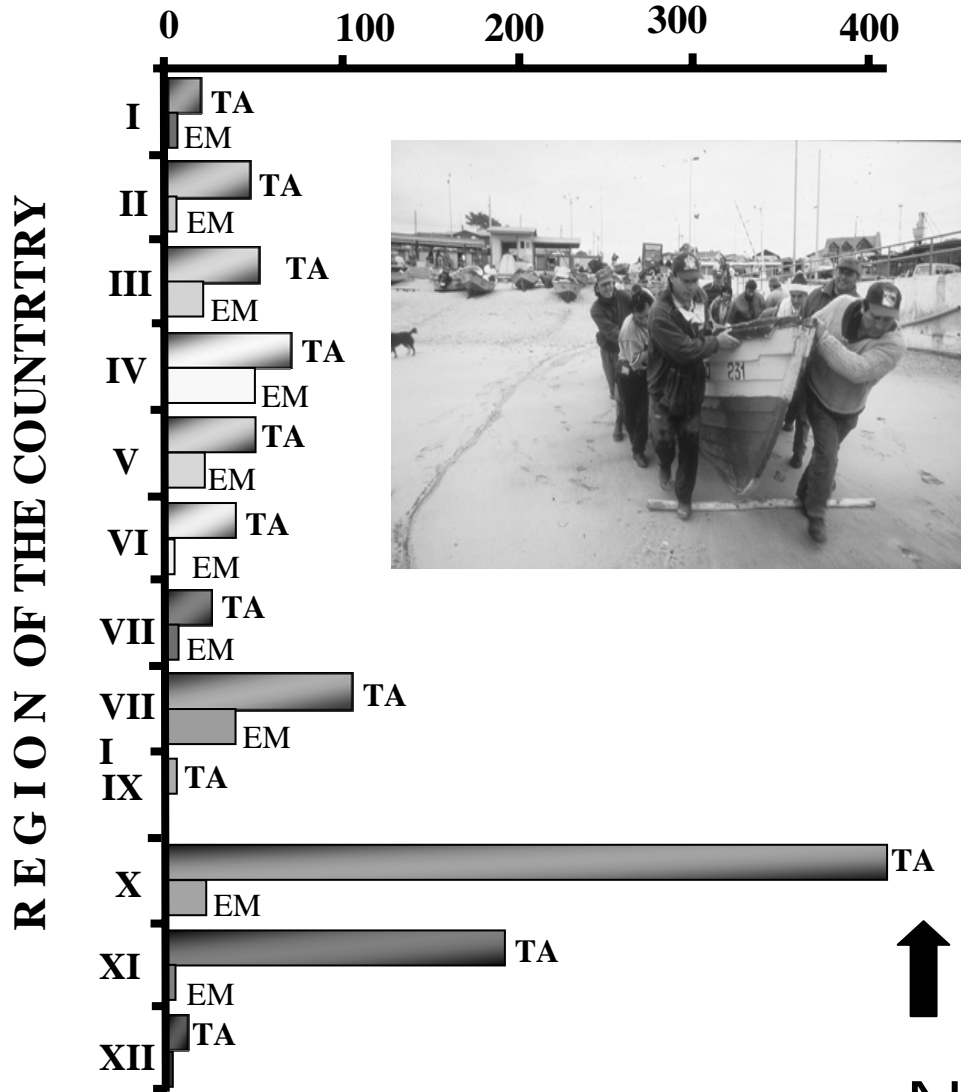
LEY GENERAL DE PESCA Y ACUICULTURA

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d) ***..the creation of : Management and Exploitation Areas for the extraction of benthic resources exclusively for legal organized artisan fisher communities (small-scale). Areas will be allocated by the government previous approval of a Management and Exploitation plan and for a period of four years***

A co-management scheme!

CHILE: NUMBER OF MEABRs (Micro-TURFs)



TA : Total of decreed areas
 EM: MEABRs in full operation for one or more years



NUMBER OF
 DECREED
 MEABRs
 (2009)

707

NUMBER
IN FULL OPERATION
WITH APPROVED
MANAGEMENT PLANS

547

**TOTAL SURFACE
 OF THE 547 MEABRs
 IN THE COUNTRY:
 1100 km²**

**A great potential for
 marine connectivity!**

Community TAC for a diver inside a MEABR

Resources managed in MEABRs:
Loco, Key-hole limpets, Sea-urchin,
Crabs, Bivalves (scallops, mussels)
Octopus, Kelps

The muricid gastropod “loco”
Concholepas concholepas

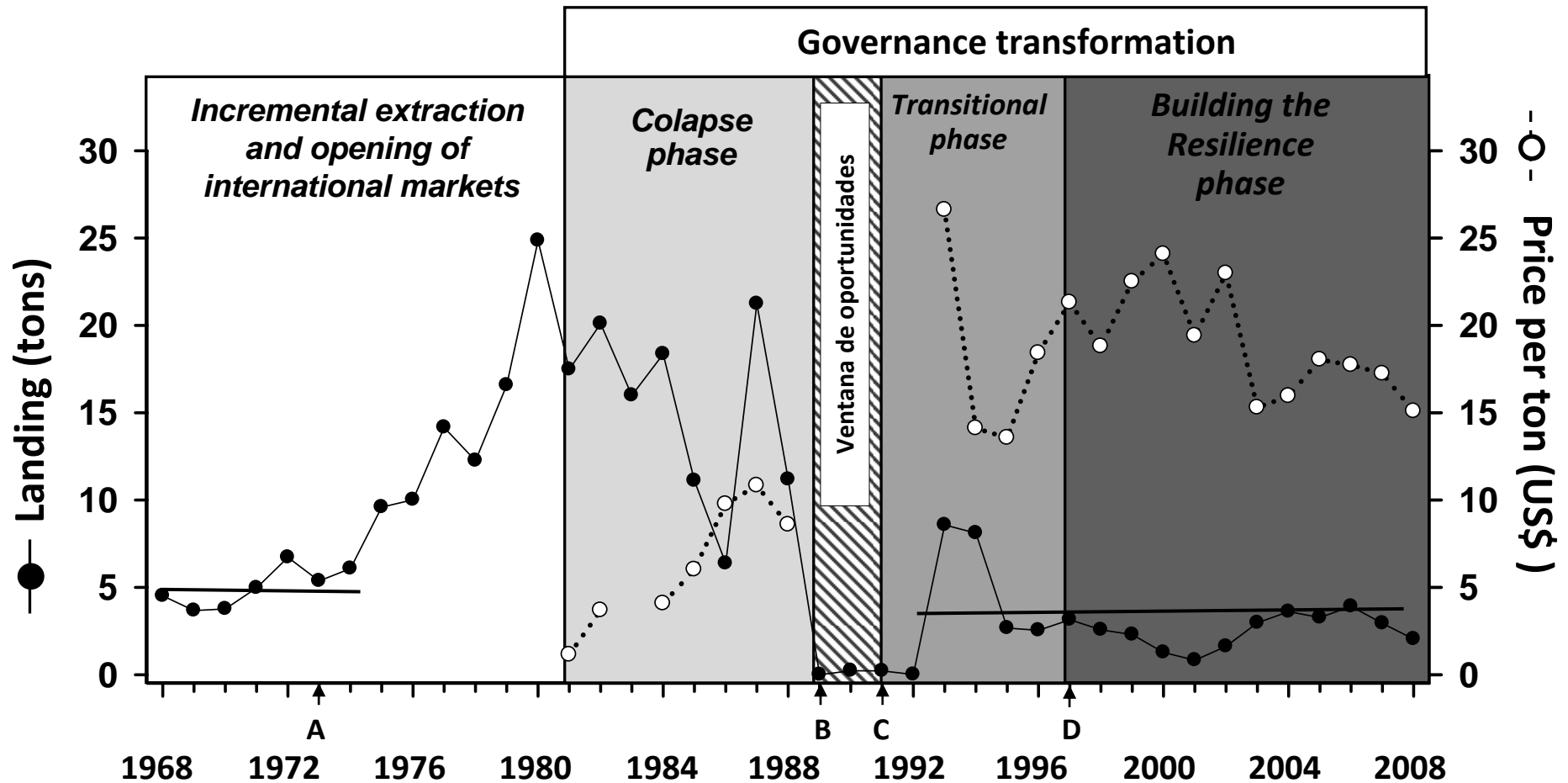
Community TAC: 1800 “locos” per diver

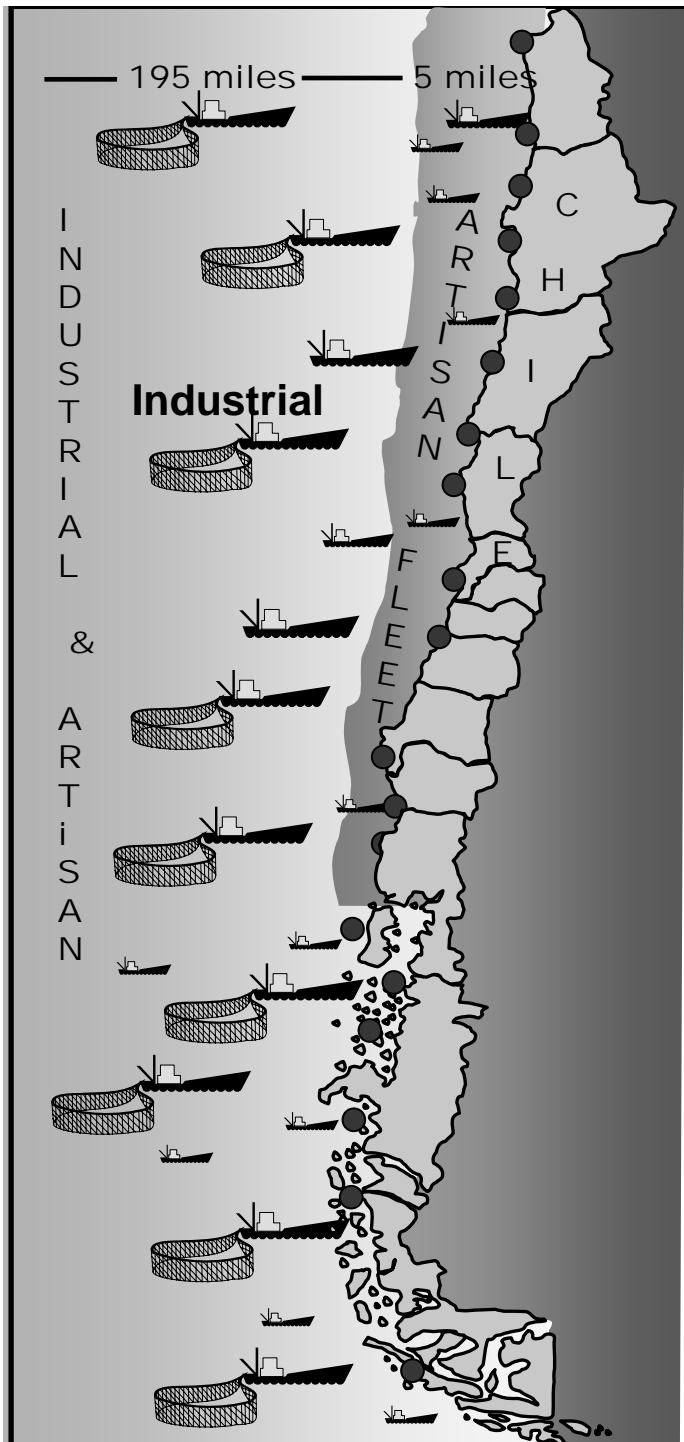


Navigating transformations in governance of Chilean marine coastal resources

Stefan Gelcich^a, Terry P. Hughes^b, Per Olsson^c, Carl Folke^{c,d}, Omar Defeo^e, Miriam Fernández^{a,f}, Simon Foale^b, Lance H. Gunderson^g, Carlos Rodríguez-Sickert^h, Marten Schefferⁱ, Robert S. Steneck^j, and Juan C. Castilla^{a,f,1}

An example: landing of locos in Chile





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 - (b) Industrial (large) ships over 18 m length and or 50 gross tons as A UNIT
2. First 5 miles (coast between 18°S to 40°S and around oceanic islands, about 30 000 km²) for the exclusive artisan fishery fleet (all fisheries)
3. Territorial User Rights for Fisheries (TURFs), ● for benthic resources allocated to local organized communities in the form of Management and Exploitation Areas for Benthic Resources (MEABRs)
4. For 10 highly exploited species (sardine, anchovy, jack mackerel, shrimps, etc) management is based on the allocation of fishery quotas. No quota transferability inside the artisan fleet and very reduced transferability inside the industrial fleet

1991-2010

Are there any effects on the evolution of the fleets and landings?

CHILE: EVOLUTION OF ARTESAN FLEET AND NUMBER OF FISHERS AFTER THE LAW WAS PASSED

Small- scale boats up to 10 m (diving and inner-inshore fisheries)



Mid-scale artisan lancha
(> 18 m and > 50 gross tons)



Number of Artisan boats/lanchas

Small-scale boats (less 10 m):

1996: ca. 5 000

2006: ca. 10 555

Mid-scale "lanchas":

1996: ca. 1 000

2006: ca. 4 100

*An increase of ca. 55-60%....
INCREASE in vessel holding
capacity of about 15,000 m³*

Number of Artisan Fishers

1995: ca. 57 000

2006: ca. 67 314

An increase of ca. 15%

EVOLUTION OF THE INDUSTRIAL FLEET AND VESSEL HOLDING CAPACITY AFTER THE LAW WAS PASSED

Vessels > 18 m length and
or 50 gross tons



Number of vessels

1996: 524

2006: 223

A reduction of ca. 42%

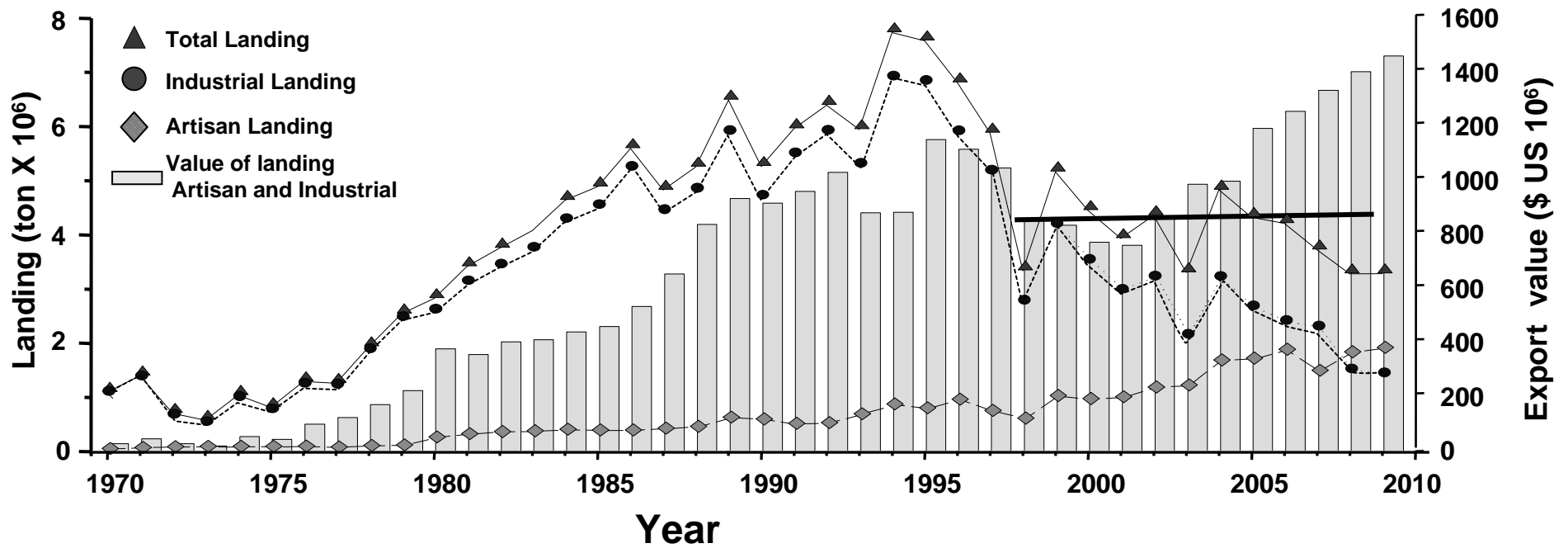
Vessel holding capacity

1996 = 300 000 m³

2006 = 150 000 m³

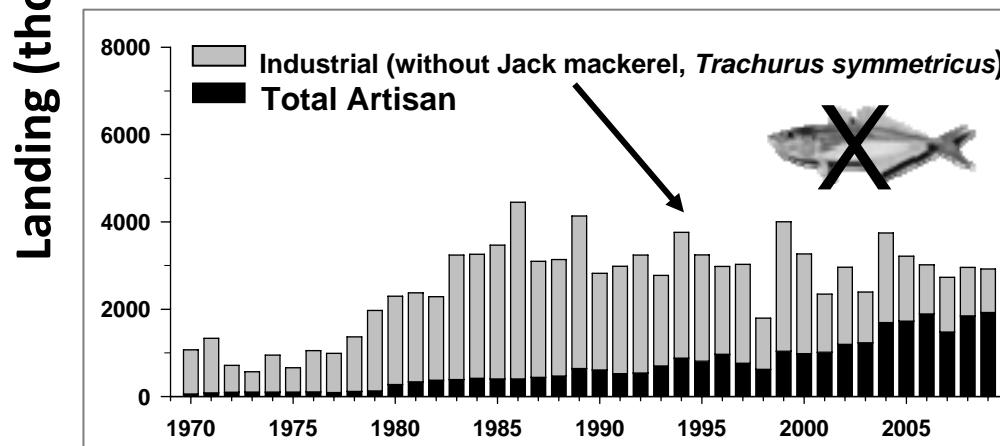
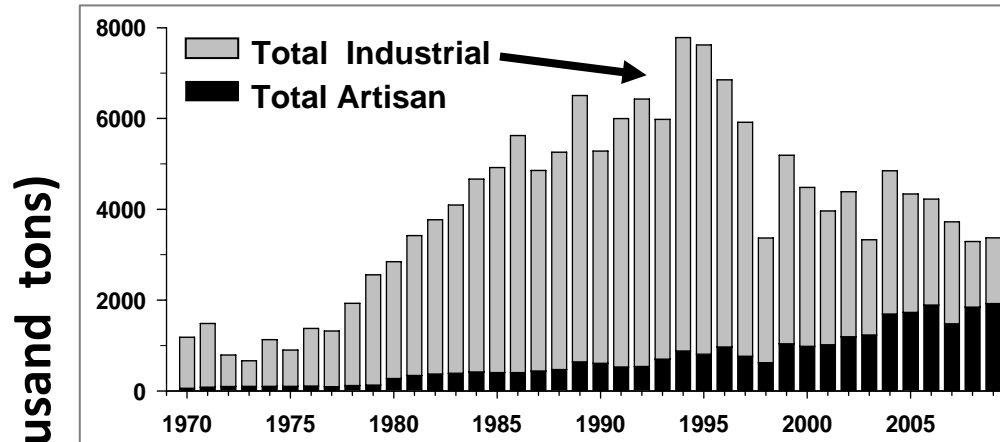
*A reduction of ca. 50% or
equivalent to ca. 150,000 m³*

*Landings: after 20 years of the Chilean Fishery Law
Does it work ?... An overview*



INDUSTRIAL FISHERY UNIT

Total Industrial Landing



Main fish species

- (*) Anchovy: *E. ringens*
- (*) Common sardine: *S. bentincki*
- (*) Jack mackerel: *T. symmetricus*
- (*) Hoki, P. grenadier: *M. magellanicus*
- (*) Chilean hake: *M. gayi gayi*
- (*) Southern hake: *M. australis*
- (*) Southern blue whiting: *M. australis*
- (*) P. cush-eel : *Genypterus blacodes*
- (*) Splendid alfonsino: *B. splendens*
- (*) Cardinalfish: *E. crassicaudus*

Mote sculpin: *N. crockeri*

Chub mackerel: *S. japonicus*

Falkland herring: *S. fuegensis*

Pacific menhaden: *E. maculatum*

Ray bream: *B. australis*

Crustaceans

(*) Blue squat lobster: *C. johni*

(*) Chilean nylon shrimp: *H. reedi* (*)

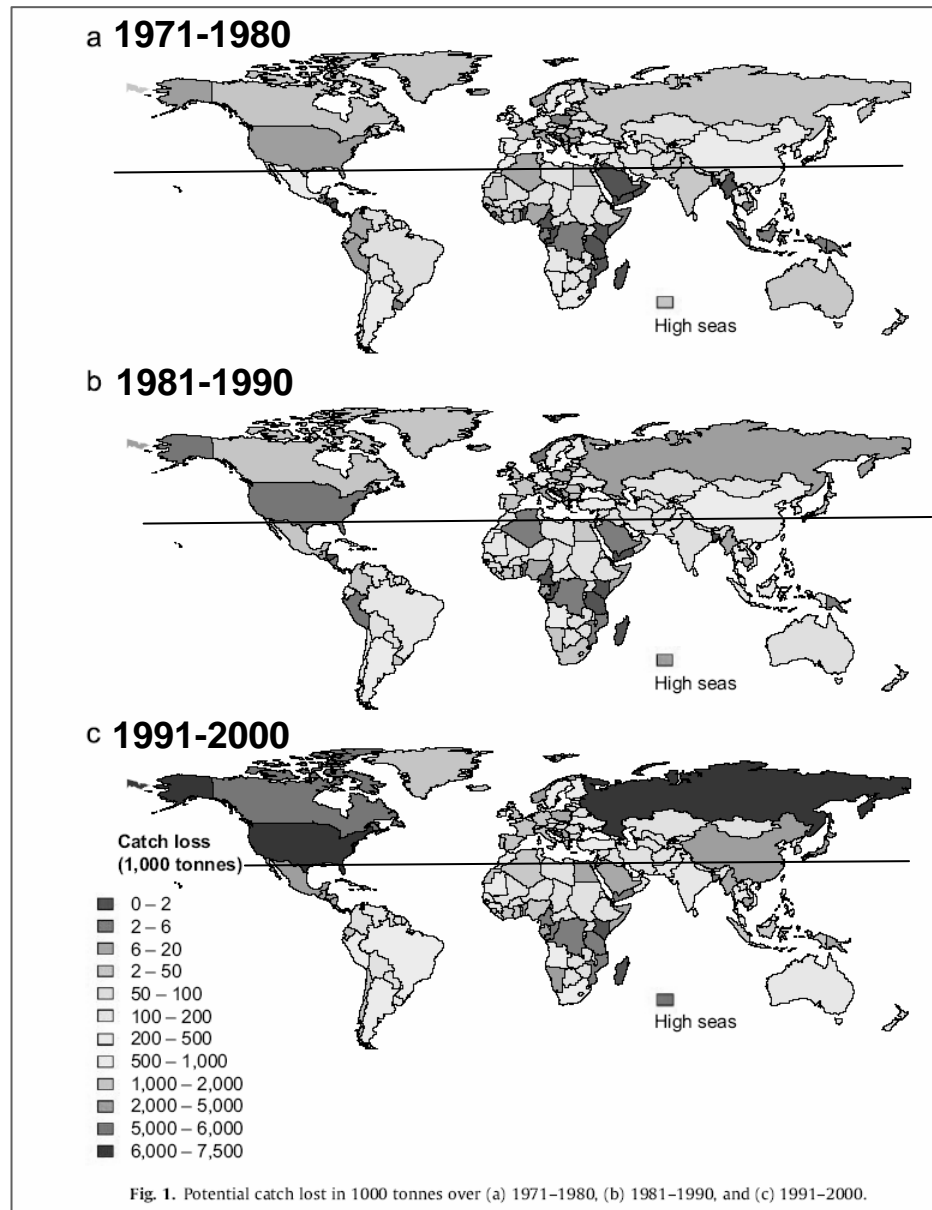
Squat lobster: *P. monodon*

(*) *Managed with TACs: Industrial and Artisan Quotas*

Global fisheries losses at the exclusive economic zone level, 1950 to present

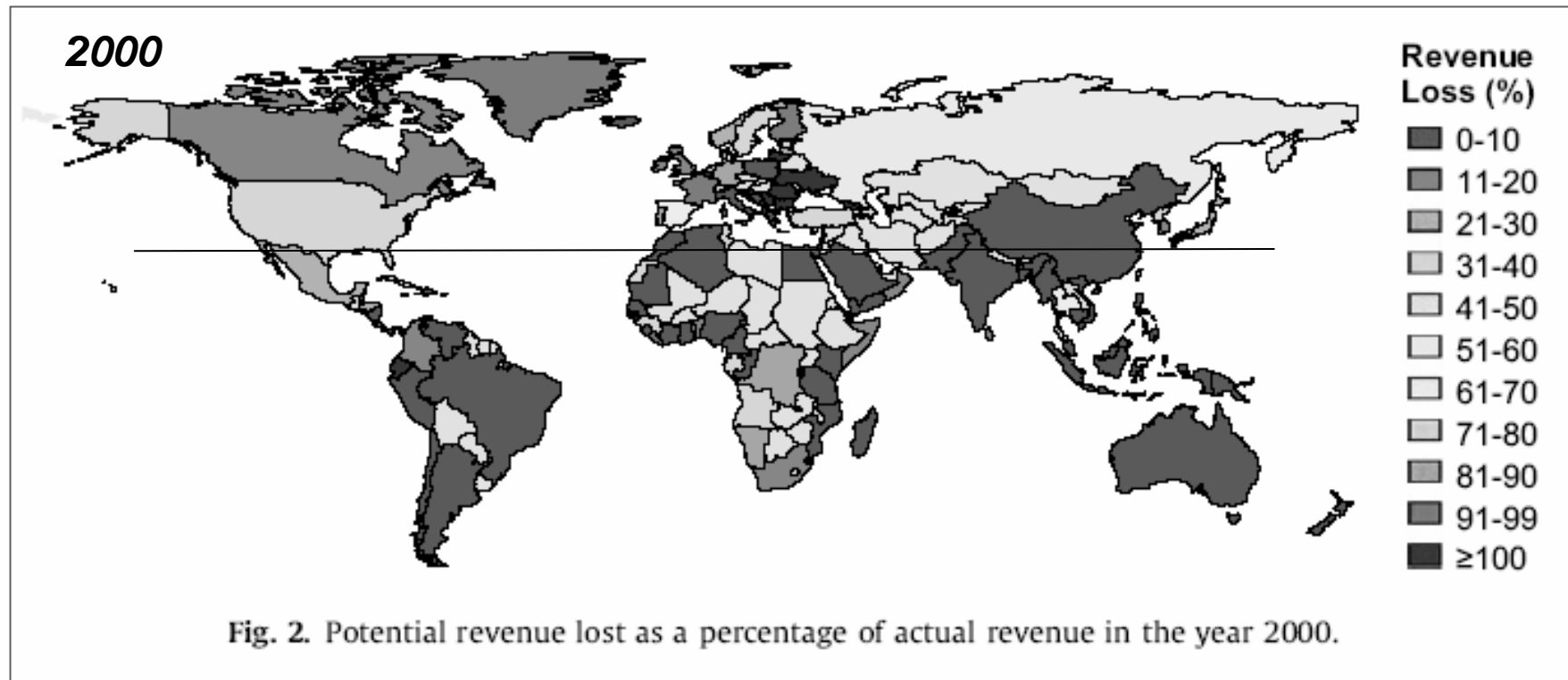
U. Thara Srinivasan^{a,c,*}, Reg Watson^b, U. Rashid Sumaila^{b,c}

A meta-analysis



Global fisheries losses at the exclusive economic zone level, 1950 to present

U. Thara Srinivasan^{a,c,*}, Reg Watson^b, U. Rashid Sumaila^{b,c}

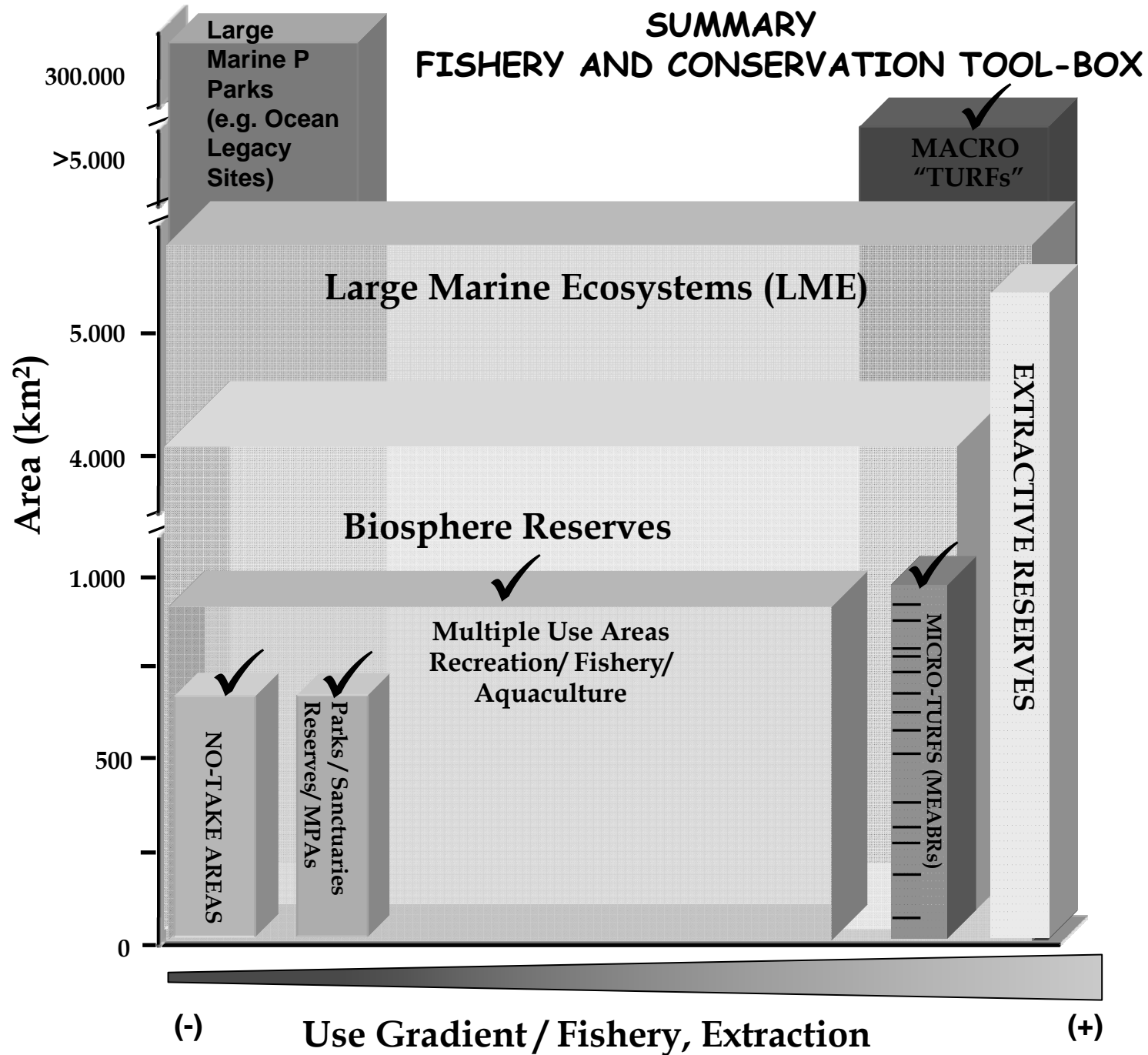


BACK TO CHILE: ADAPTIVE PROCESS (December 2012)

The task is to modify/adapt fishery rules that have not work properly

1. **MODIFY WAY IN WHICH QUOTAS FOR FULLY-EXPLOITED SPP HAVE BEEN ASSIGNED BY THE FISHERY NATIONAL BOARD (see Leal et al. 2009, Marine Policy)**
2. **PERHAPS: REDUCE EXCESIVE NUMBER OF MICRO-TURF ALLOCATIONS FOR BENTHIC RESOURCES**
3. **PERHAPS: THE GOVERNMENT DID NOT USED PERCENTAGE QUOTA AUCTION MECHANISM ON FULLY-EXPLOITED SPP**
4. **PERHAPS: GOVERNMENT QUOTA AUCTIONS FOR FULLY-EXPLOITED SPP**
4. **STOP/REGULATE MID-WATER TRAWLING**

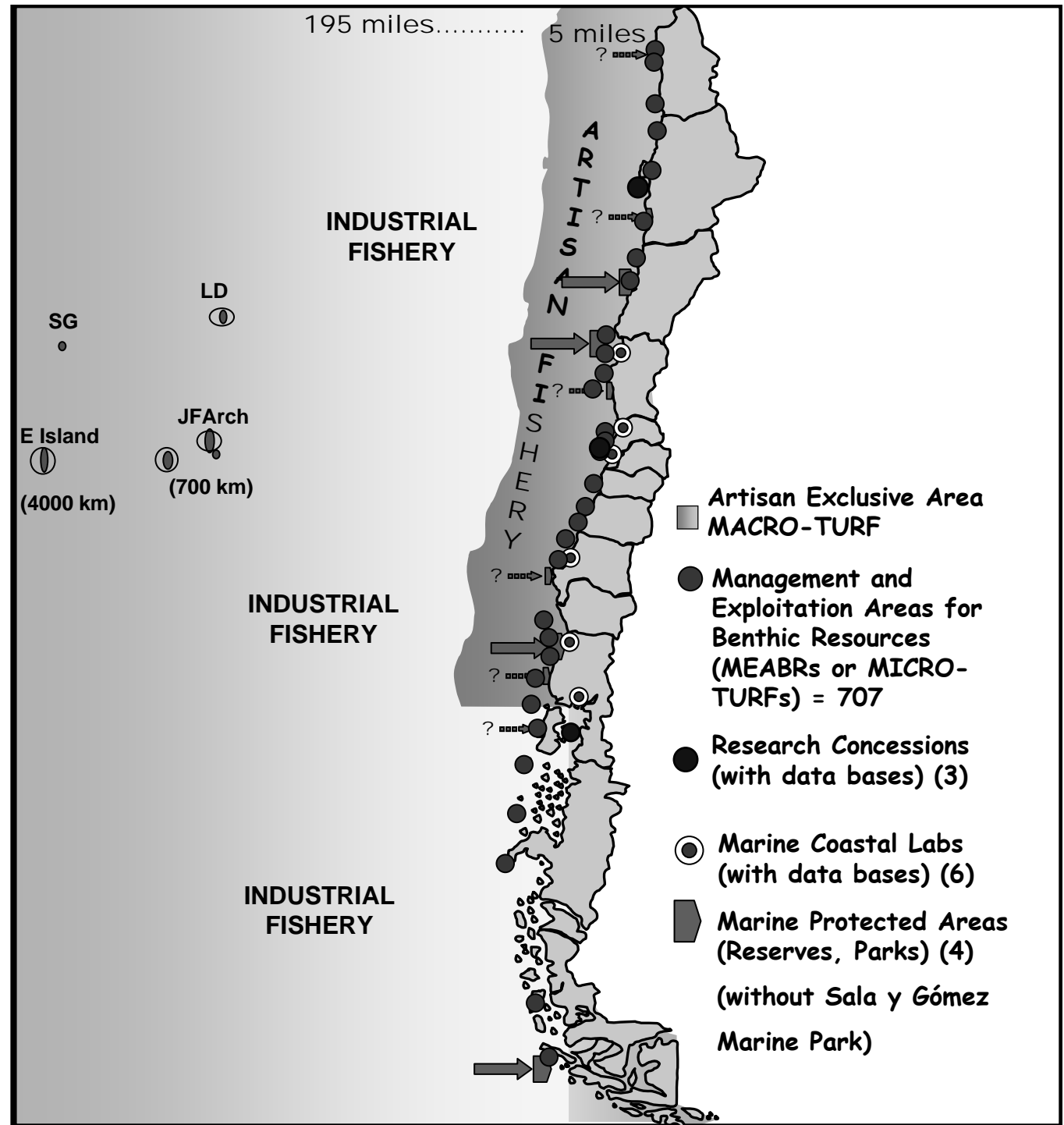
(...IMPROVE STOCK ASSESSMENT OF FULLY-EXPLOITED SPP AND IMPROVE DATA COLLECTION IN DATALESS FISHERIES...)



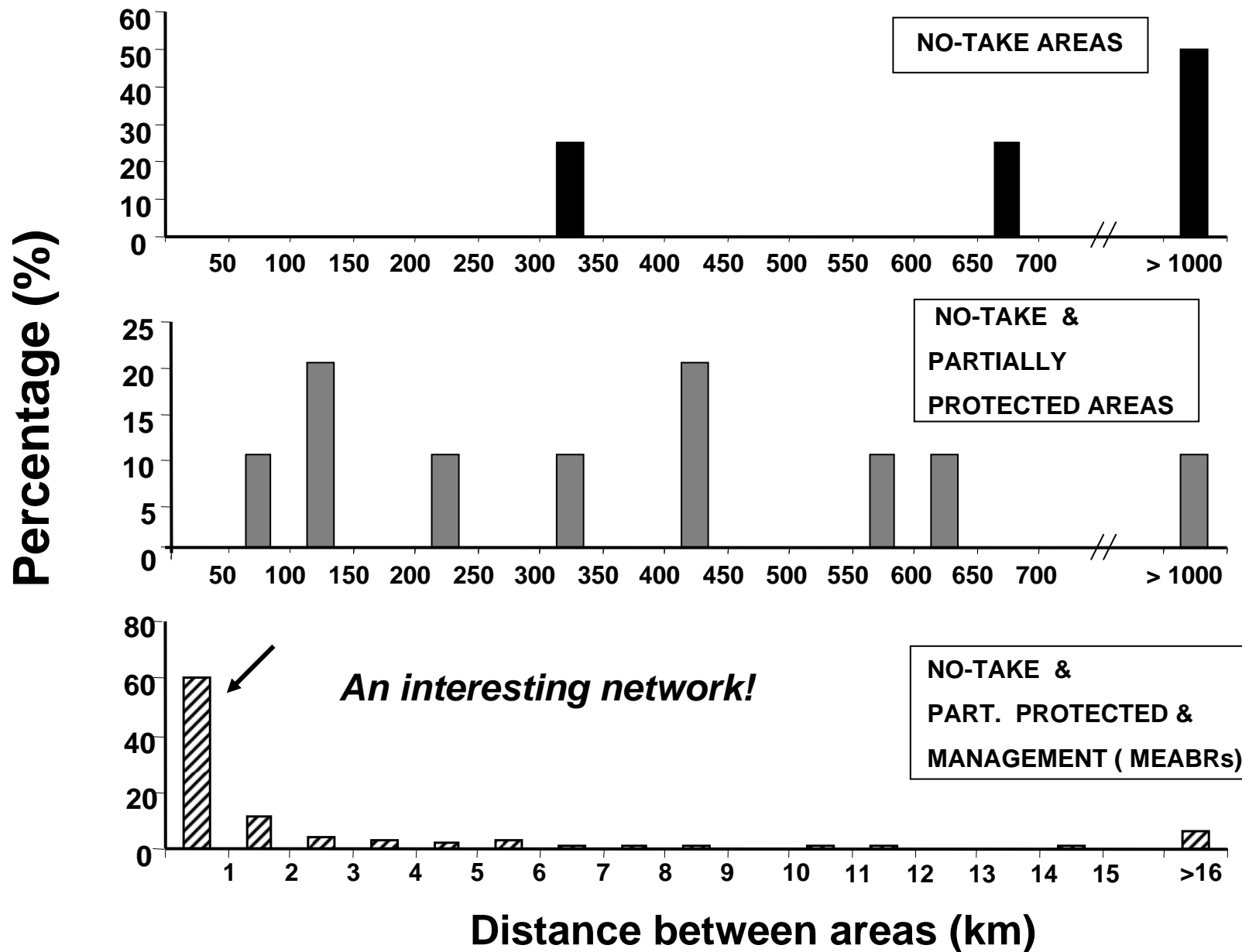
So, this is what we have in Chile regarding fishery spatial management rights and conservation (Governance)

One conclusion:

Along the coast of the country there exist an interconnected network of fishery management and conservation areas



Space: a marine interconnected network



Thanks to Omar Defeo for the invitation. It is always a great pleasure to be back in Uruguay

In fisheries you always ought keep an eye on the Governance Wave and to Adapt

