

# Small pelagics in the Blue Economy: Steppingstones from research into implementation

**Dr. Andrés Cisneros-Montemayor**

Assistant Professor, School of Resource and Environmental Management, SFU  
Deputy Director, Nippon Foundation Ocean Nexus Program  
**a\_cisneros@sfu.ca**

**Dr. Sieme Bossier**

National Institute of Aquatic Resources, DTU  
Section for Ecosystem based Marine Management



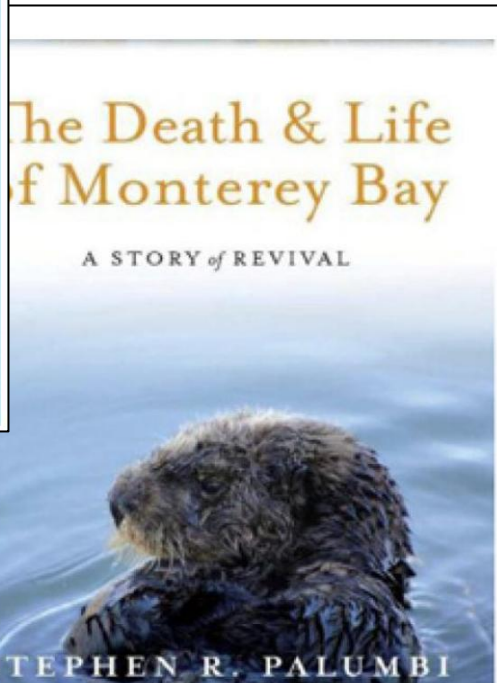
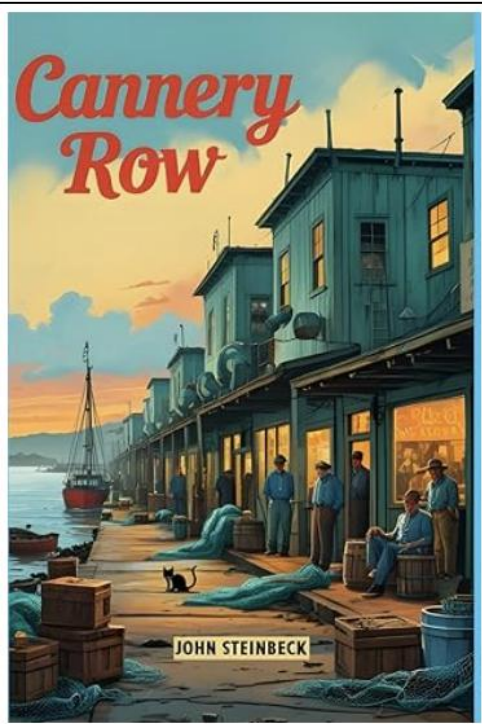
SIMON FRASER  
UNIVERSITY

## Key message

- Small pelagics research and management must engage and be central in the Blue Economy.
- That will need more formal engagement with the social contexts surrounding fisheries.



13 12 2001



Managing a crucial link in ocean food webs  
A report from the Lenfest Forage Fish Task Force

CISNEROS-MATA ET AL.: RISE AND FALL OF PACIFIC SARDINE IN GULF OF CALIF.  
CalCOFI Rep., Vol. 36, 1995

### THE RISE AND FALL OF THE PACIFIC SARDINE, *SARDINOPS SAGAX CAERULEUS* GIRARD, IN THE GULF OF CALIFORNIA, MEXICO

MIGUEL A. CISNEROS-MATA,  
MANUEL O. NEVÁREZ-MARTÍNEZ  
Instituto Nacional de la Pesca  
Centro Regional de Investigaciones Pesqueras (INP-CRIP)  
Guaymas, Sonora, 85400  
México

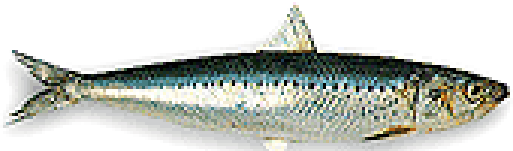
M. GREGORY HAMMANN\*  
Centro de Investigación Científica y de  
Educación Superior de Ensenada (CICESE)  
Apartado Postal 2732  
Km. 107 Carr. Tijuana-Ensenada  
Ensenada, Baja California, 22800  
México

CLIMATE

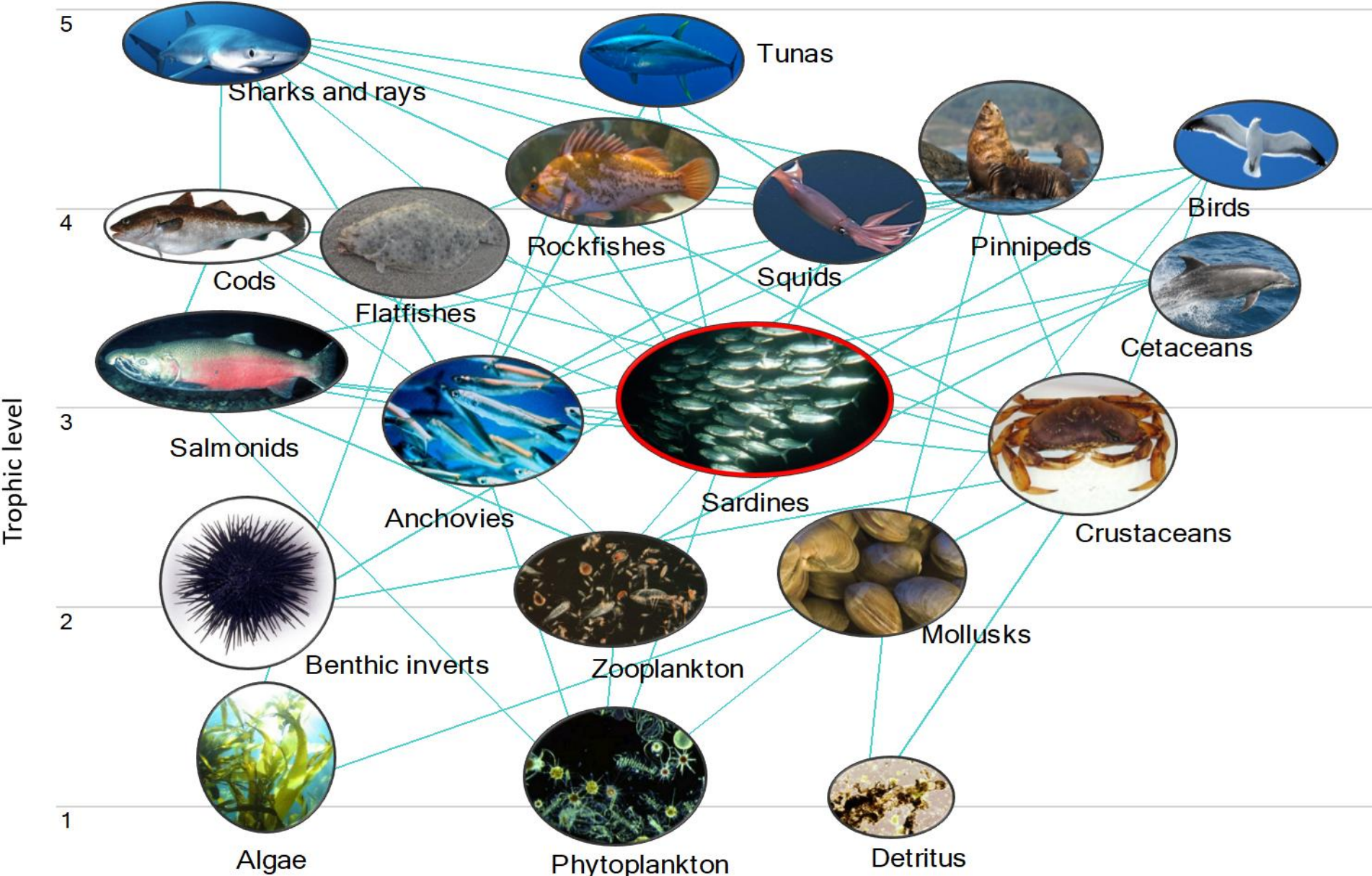
## From Anchovies to Sardines and Back: Multidecadal Change in the Pacific Ocean

Francisco P. Chavez,<sup>1\*</sup> John Ryan,<sup>1</sup> Salvador E. Lluch-Cota,<sup>2</sup> Miguel Niquen C.<sup>3</sup>

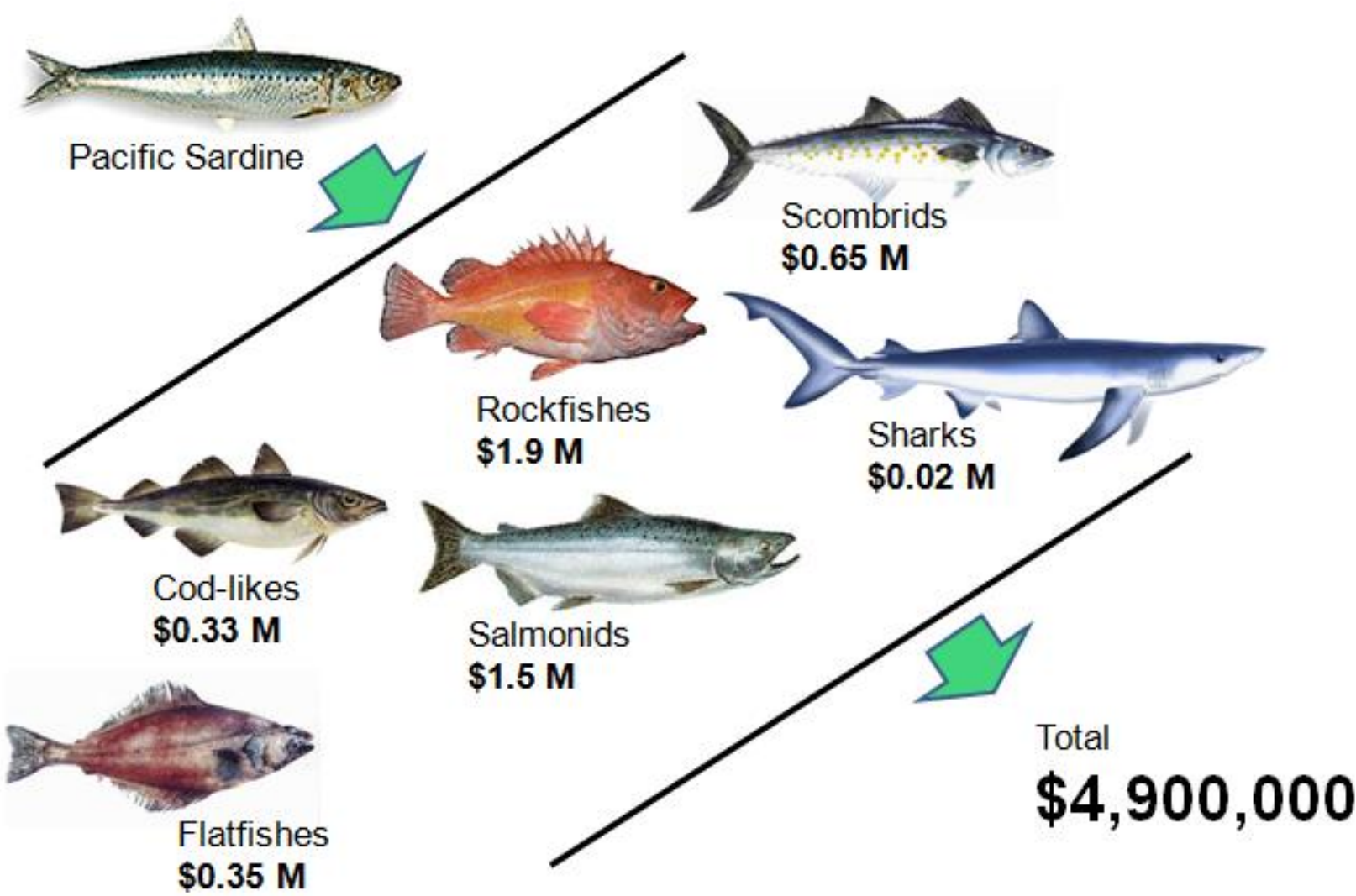
# Forage fish are central to ocean ecosystems



20 cents/kg ?



# Forage fish are central to the **ocean economy**



# Forage fish are central to the ocean economy



<https://www.globalseafood.org/advocate/tuna-aquaculture-faces-challenges-in-continued-growth/>

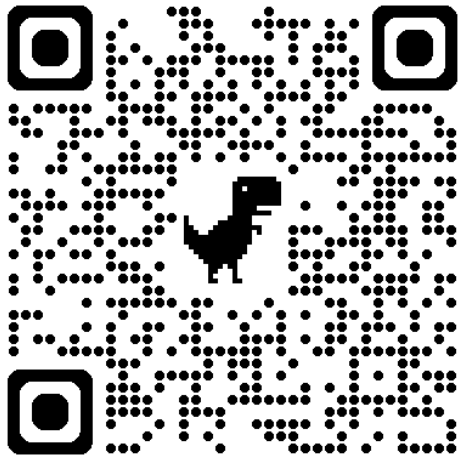
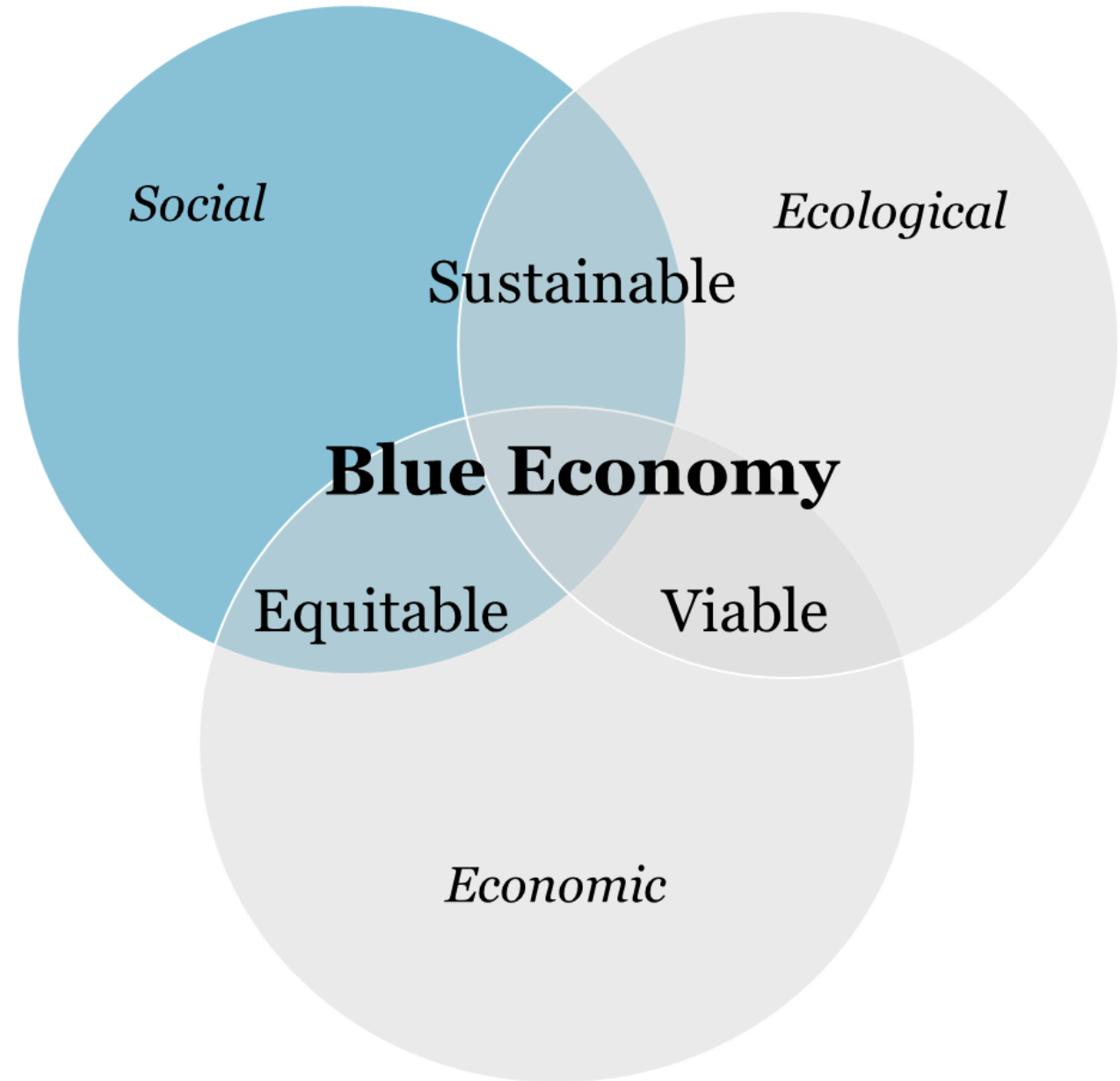
Behind every great industry there is a small pelagic



Blue Economy  
(and other industries)

# What is a Blue Economy?

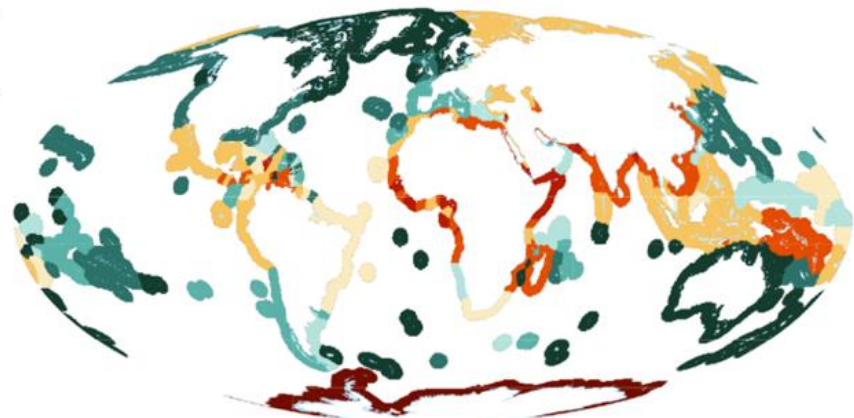
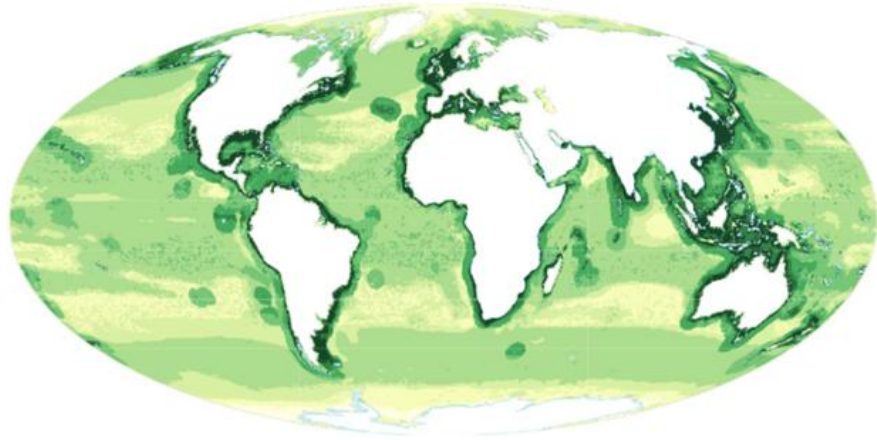
Blue Economy:  
ocean resource-based sectors that are  
socially equitable,  
environmentally sustainable, and  
economically viable



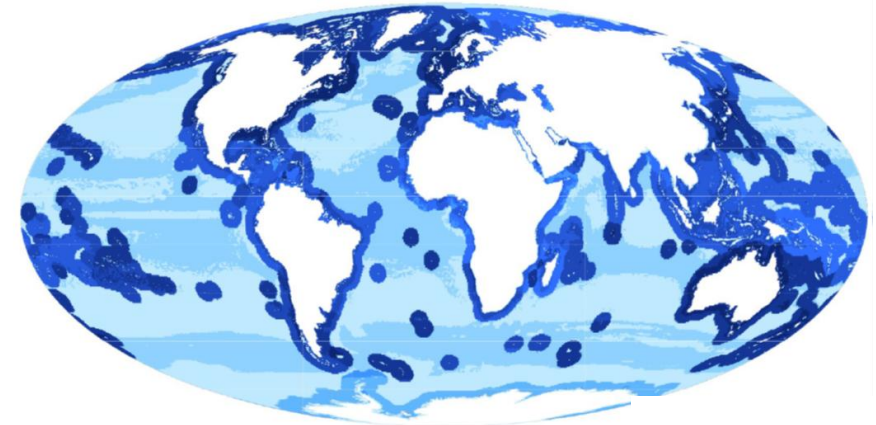
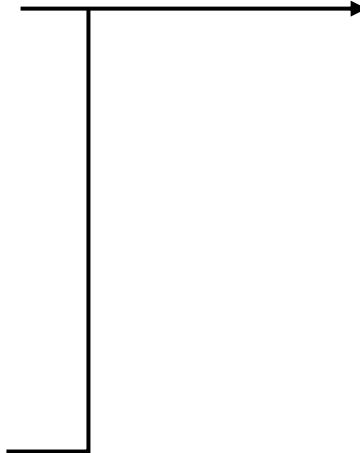
# Can we establish a Blue Economy?

The global differences in capacity for establishing a Blue Economy are *not* environmental but social and economic. Challenges with human rights, corruption, and infrastructure can be addressed through anti-inequity actions.

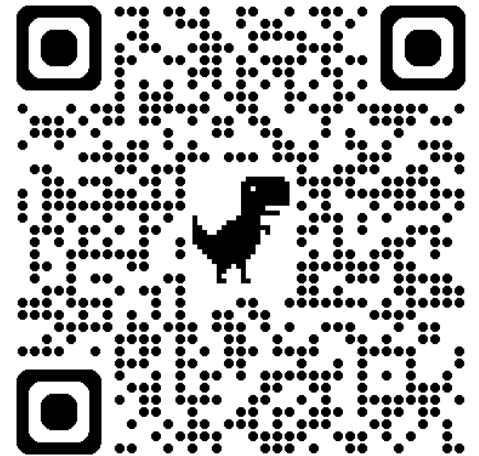
Resource Availability



Enabling Conditions



Blue economy capacity  
≤10 ≤50 ≤90

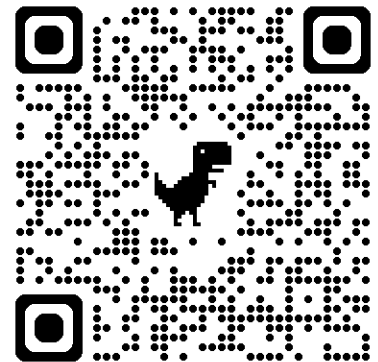
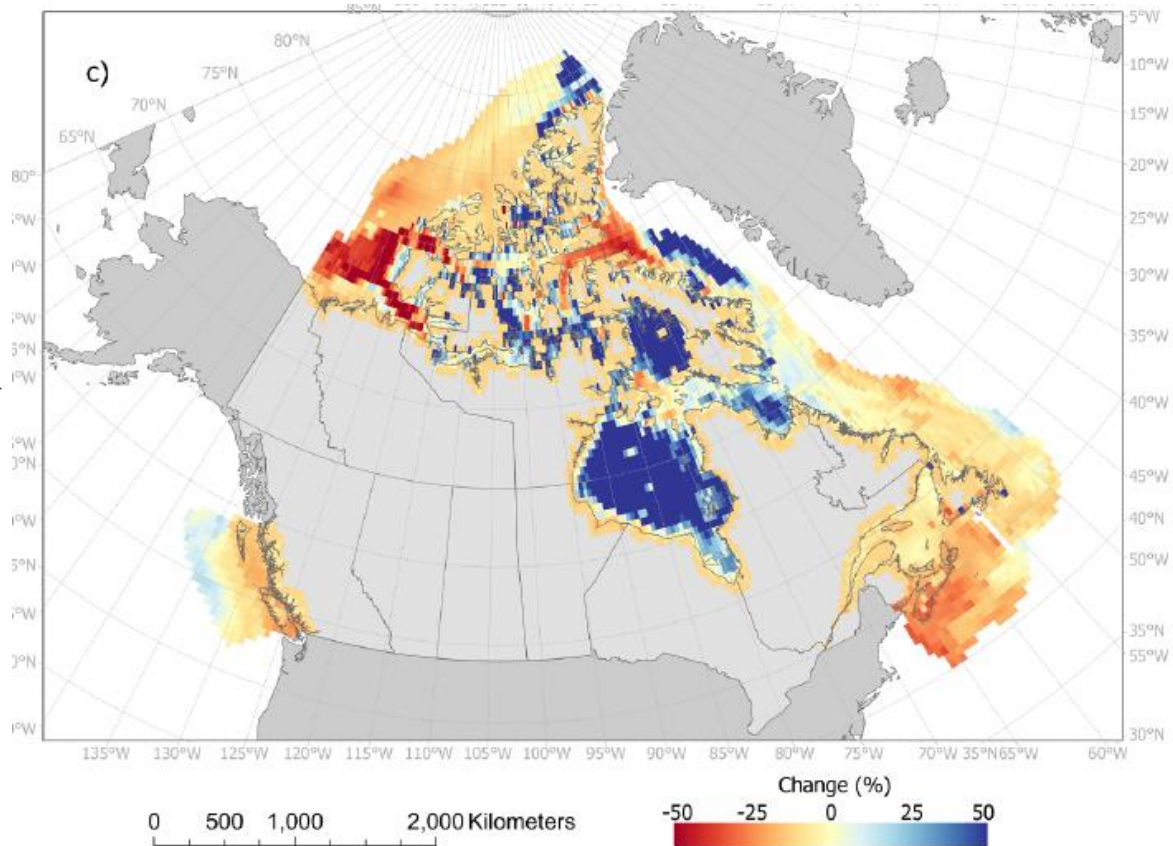


# Can we establish a Blue Economy?

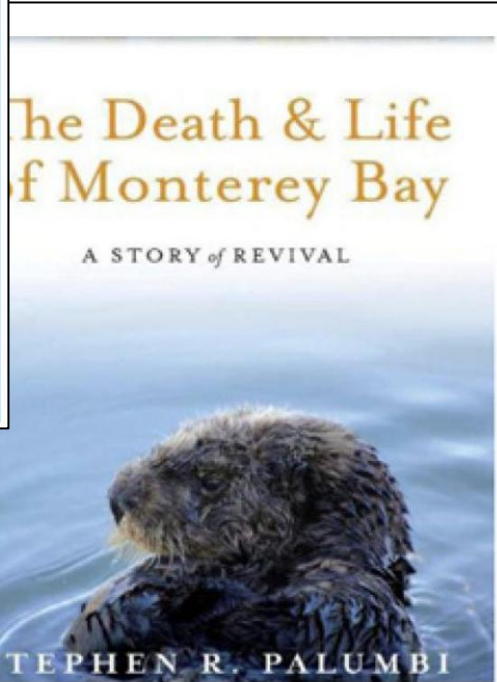
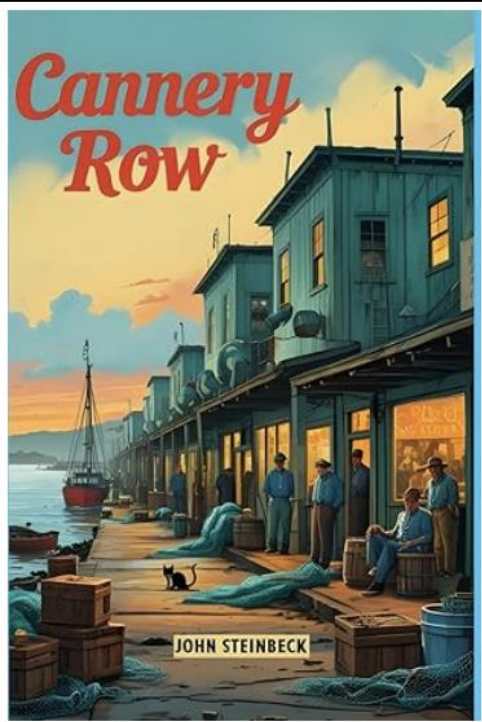
Climate change could drive declines of up to 50% in Blue Economy capacity by 2050 compared with today, but local trends are very variable.

Providing better advice for Blue Economy planners depends on better integrating climate drivers and social relationships within interconnected systems.

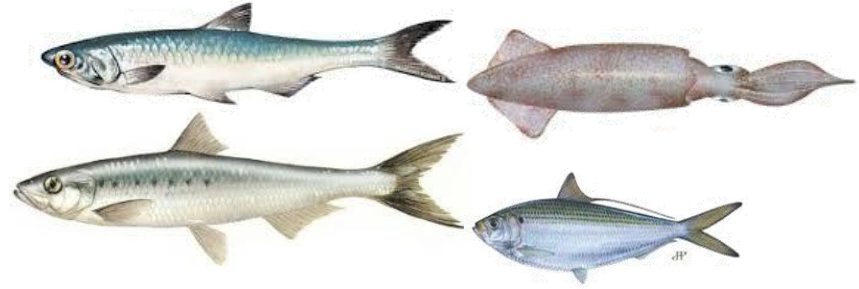
Climate projections



# Social relationships, interconnected systems, climate drivers?



Managing a crucial link in ocean food webs  
A report from the Lenfest Forage Fish Task Force



[has entered the chat]

CISNEROS-MATA ET AL.: RISE AND FALL OF PACIFIC SARDINE IN GULF OF CALIF.  
CalCOFI Rep., Vol. 36, 1995

**THE RISE AND FALL OF THE PACIFIC SARDINE, *SARDINOPS SAGAX CAERULEUS* GIRARD, IN THE GULF OF CALIFORNIA, MEXICO**

MIGUEL A. CISNEROS-MATA,  
MANUEL O. NEVÁREZ-MARTÍNEZ  
Instituto Nacional de la Pesca  
Centro Regional de Investigaciones Pesqueras (INP-CRIP)  
Guaymas, Sonora, 85400  
México

M. GREGORY HAMMANN\*  
Centro de Investigación Científica y de  
Educación Superior de Ensenada (CICESE)  
Apartado Postal 2732  
Km. 107 Carr. Tijuana-Ensenada  
Ensenada, Baja California, 22800  
México

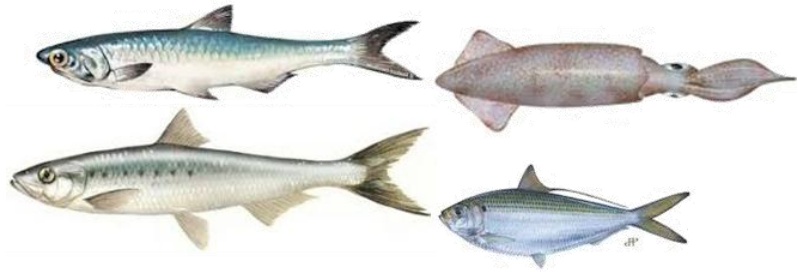
CLIMATE

**From Anchovies to Sardines and Back:  
Multidecadal Change in the Pacific Ocean**

Francisco P. Chavez,<sup>1\*</sup> John Ryan,<sup>1</sup> Salvador E. Lluch-Cota,<sup>2</sup> Miguel Niquen C.<sup>3</sup>

# Social relationships, interconnected systems, climate drivers!

And yet, fisheries (and their management and research) have sometimes been left out of Blue Economy planning altogether

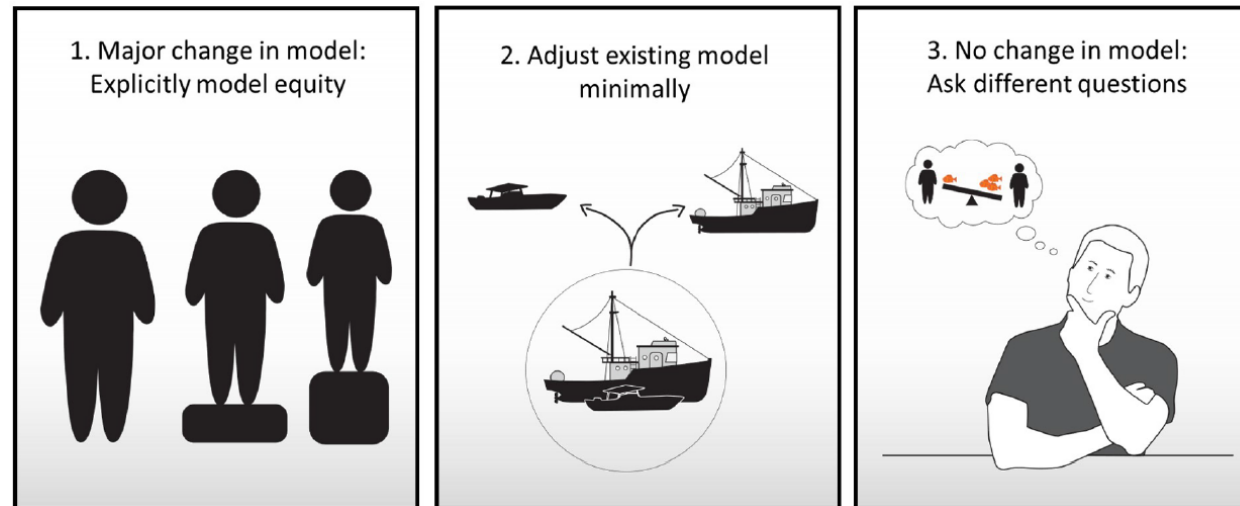


- ✓ Ecological linkages
- ✓ Ecosystem service values
- ✓ Climate drivers
- ✓ Social goals in the economy
- ✓ Data and indicator analysis

*So how can fish researchers improve our engagement with decision-making for a Blue Economy?*

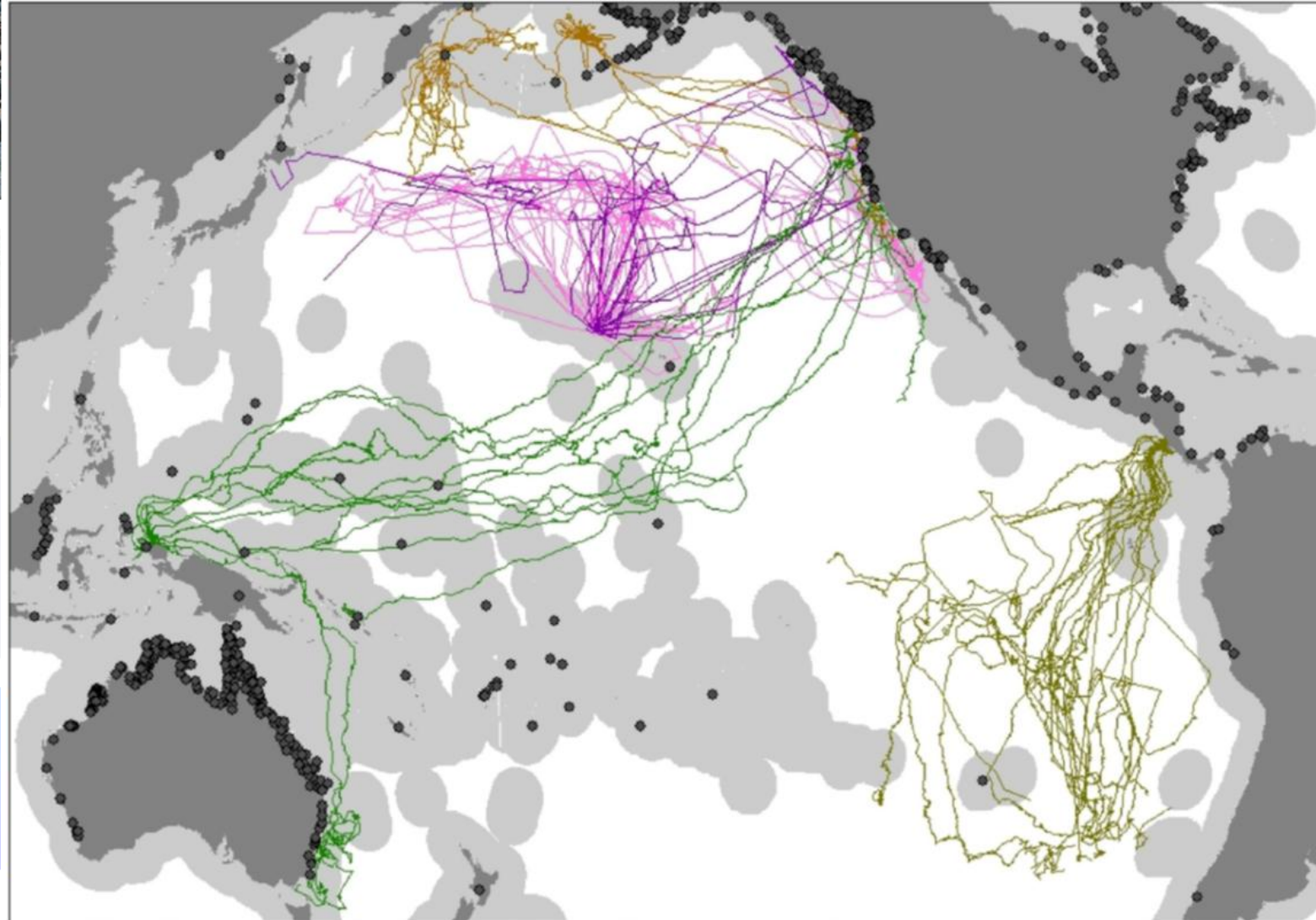
Not about more or better data (though that is important).

It's more important to understand why it is that people care about the oceans and the social relationships within management (equity), and making sure this is reflected in our models and research questions.

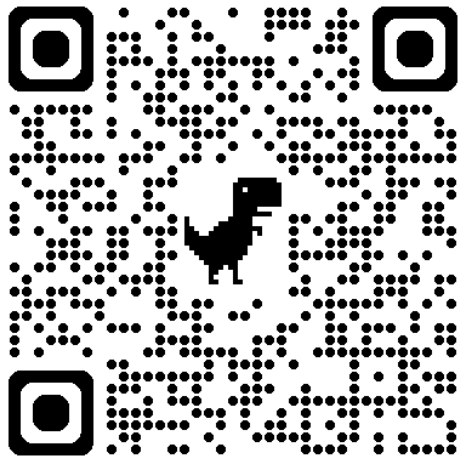


# Engaging with equity and a Blue Economy: Stepping-stones

3. No change in model:  
Ask different questions

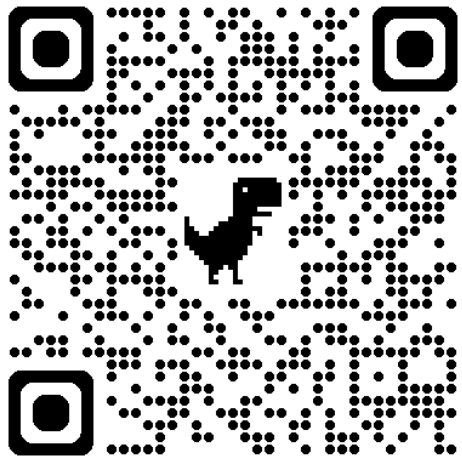
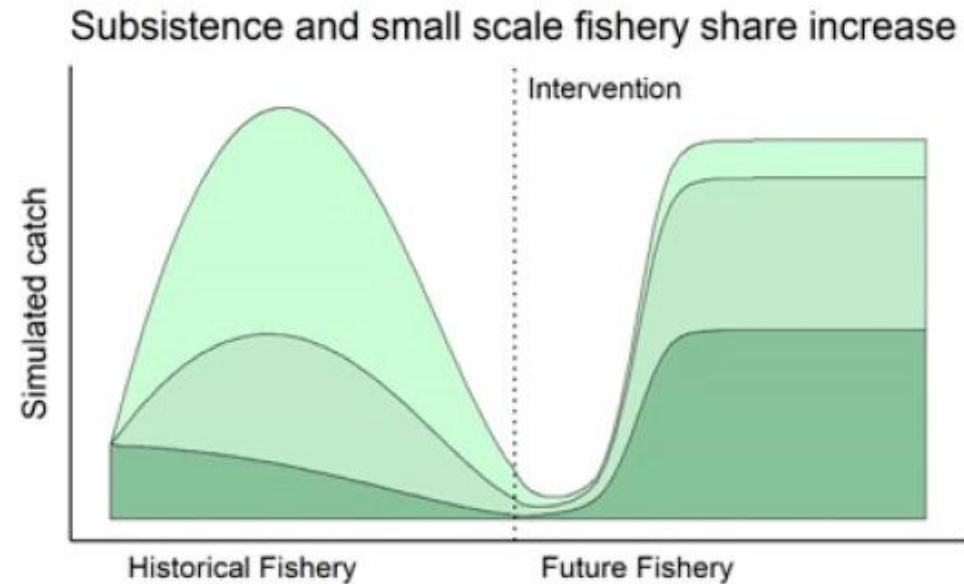
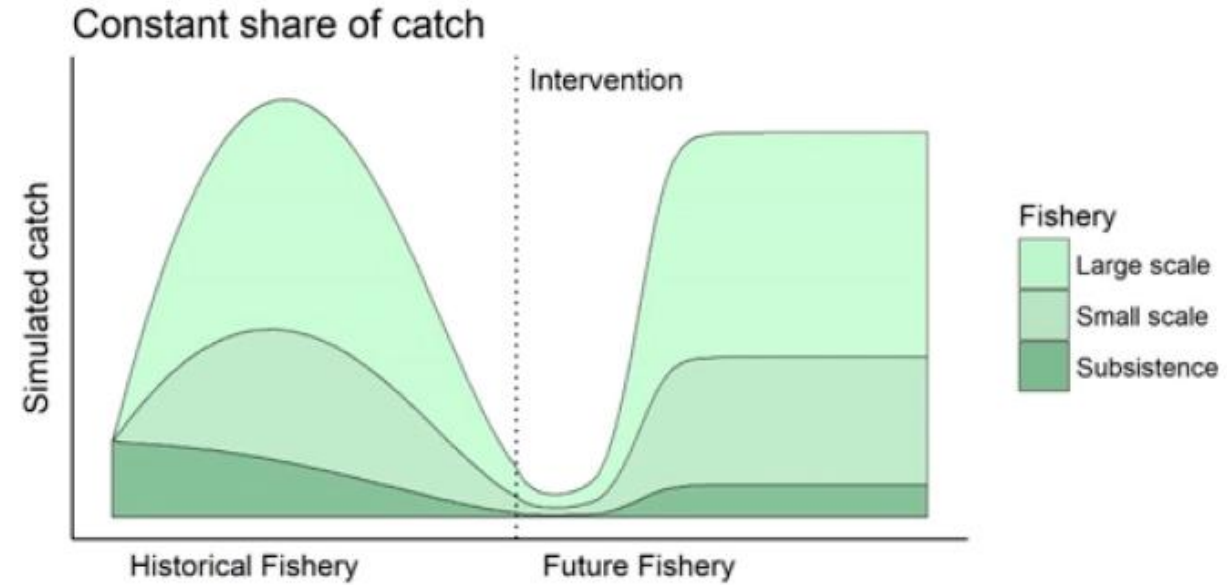
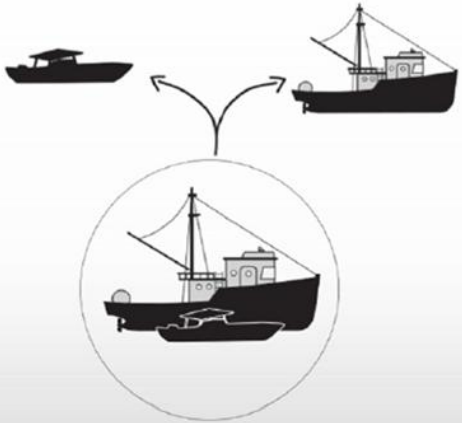


- Exclusive Economic Zone
- Coastal indigenous communities
- Northern fur seal
- Leatherback sea turtle (1)
- Leatherback sea turtle (2)
- Laysan albatross
- Black-footed albatross



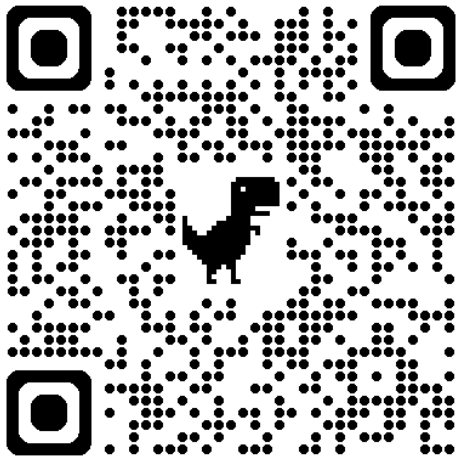
# Engaging with equity and a Blue Economy: Stepping-stones

2. Adjust existing model minimally



# Engaging with equity and a Blue Economy: Stepping-stones

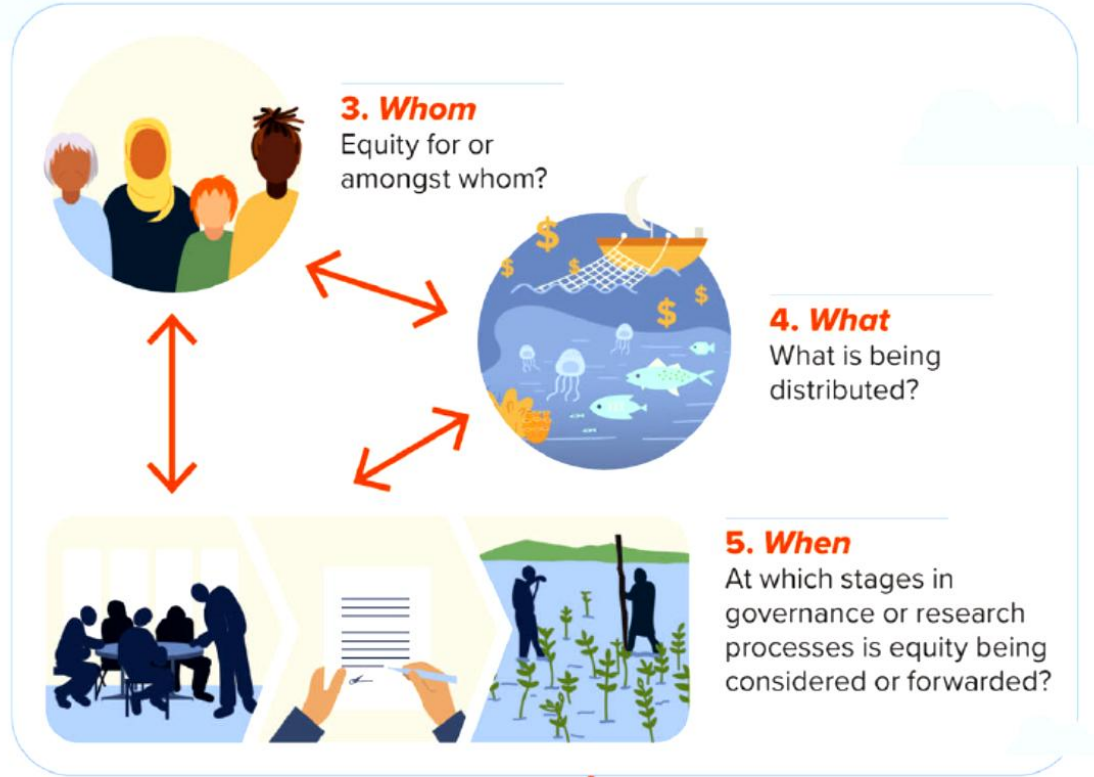
1. Major change in model:  
Explicitly model equity



**1. Where**  
In what place(s) and context(s) is equity being examined or addressed?



**2. Why**  
Why is equity being considered or addressed in this work?



**3. Whom**  
Equity for or amongst whom?

**4. What**  
What is being distributed?

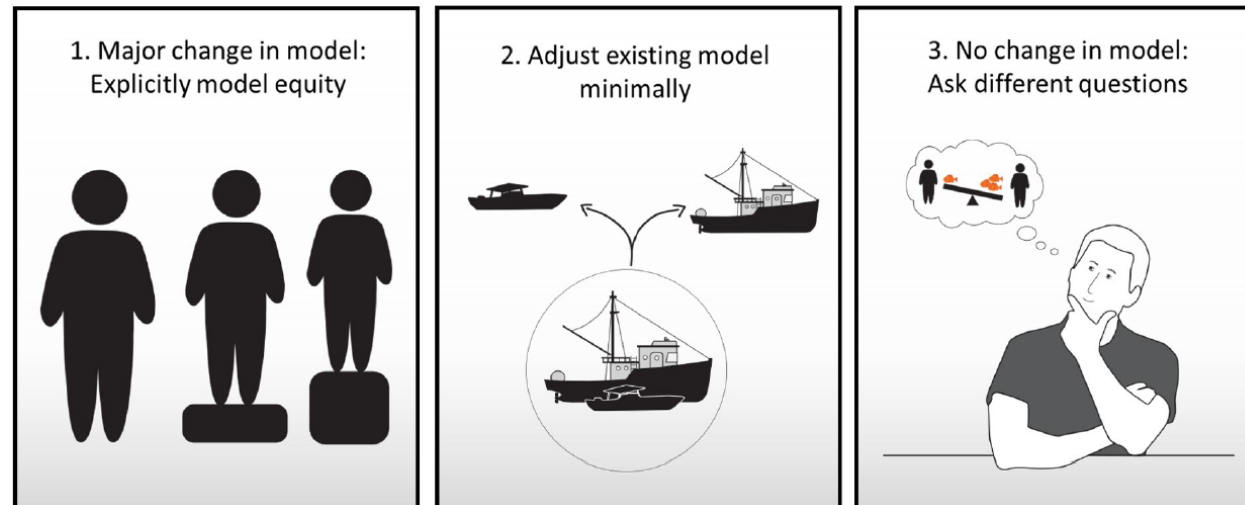
**5. When**  
At which stages in governance or research processes is equity being considered or forwarded?



**6. How**  
How do (or might) governance structures mediate, create or undermine equity?

# Key messages

- Small pelagics research and management can be central in the Blue Economy.
- That will need more formal engagement with the social contexts surrounding fisheries.
- We should aim for meaningful change and do what we can in the meantime.  
There's a lot we can do!



**¡Gracias!**

**Dr. Andrés Cisneros-Montemayor**

Assistant Professor, School of Resource and Environmental Management, SFU  
Deputy Director, Nippon Foundation Ocean Nexus Program  
**a\_cisneros@sfu.ca**

**Dr. Sieme Bossier**

National Institute of Aquatic Resources, DTU  
Section for Ecosystem based Marine Management



SIMON FRASER  
UNIVERSITY