Supporting the blue economy

The key role of diverse collaborations

Beth Fulton

2018

Old view

Image: shutterstock

New reality

Images: shutterstock

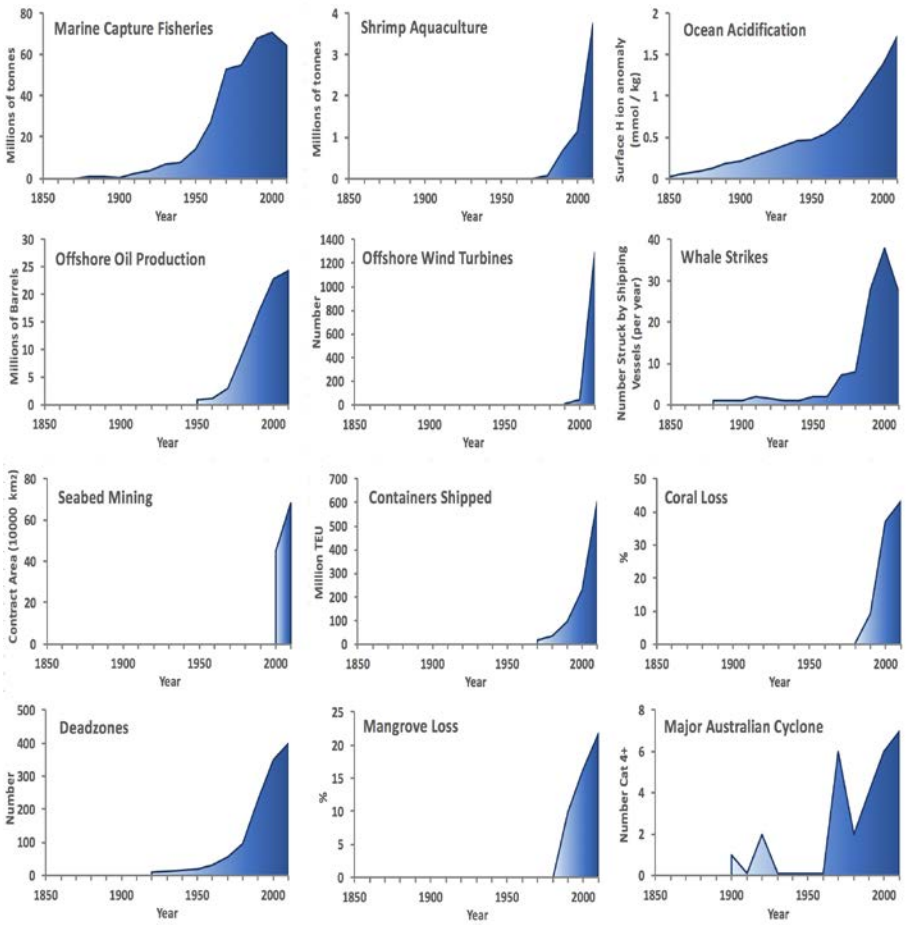
Ningaloo View

Aquatic Revolution

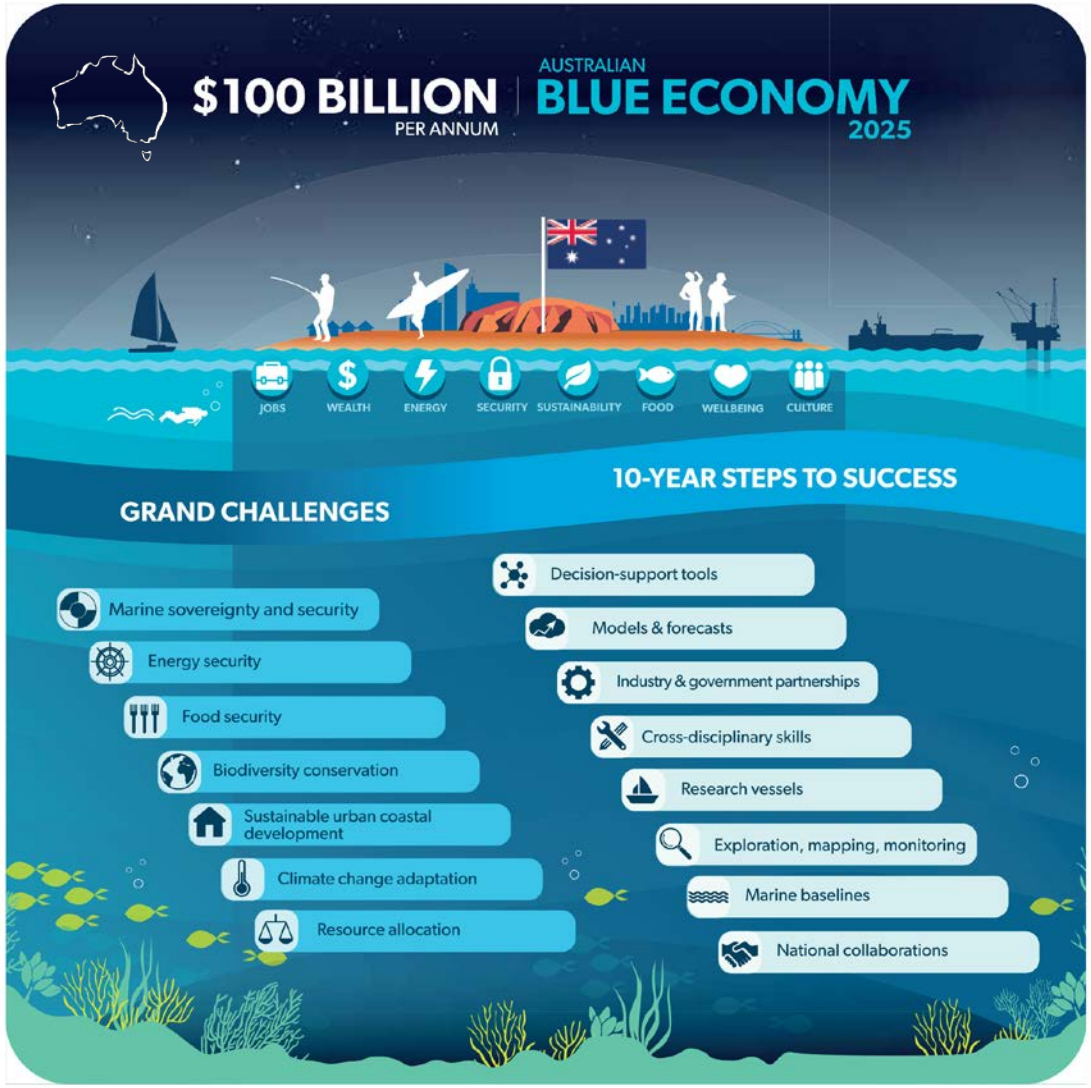
McCauley et al 2015 *Science*

The Anthropocene & The Ocean

Ocean system trends



Balancing Risks, Opportunities & Trade-offs



- $400-500 billion p.a
- $24+ trillion assets

(~7th largest economy)

Operationalising Ecosystem Based Management

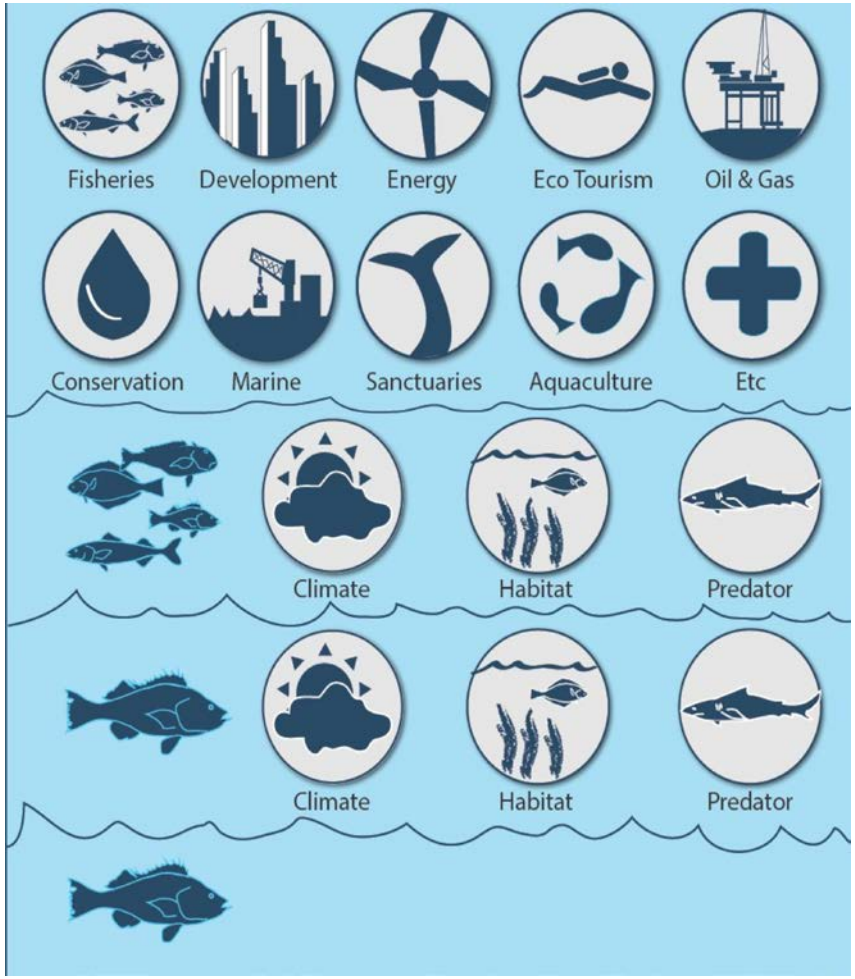
Management & Supporting Science | **Exploitation**

Entire system (EBM)

Resource system (EBFM)

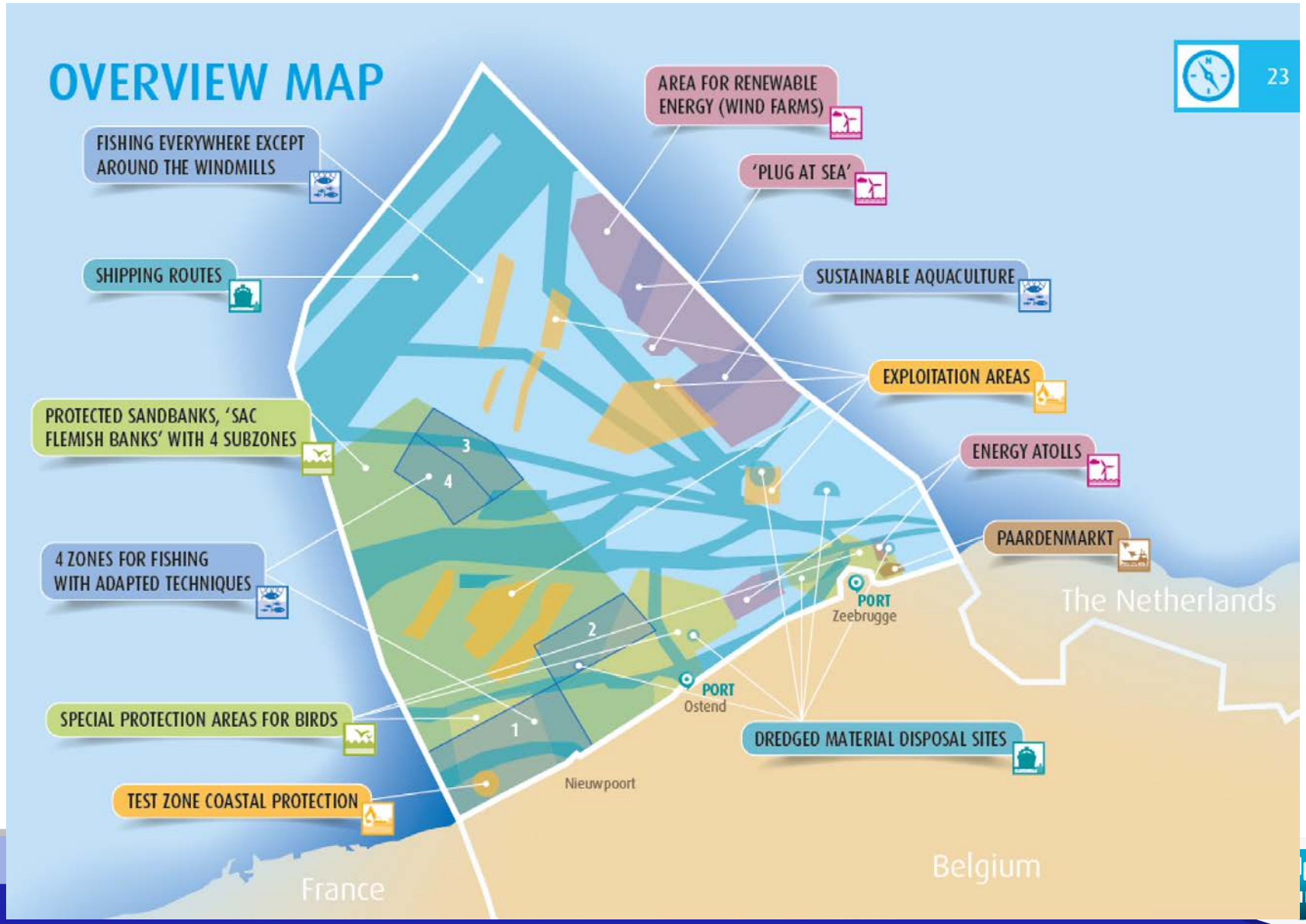
Resource & drivers (EAF)

Resource (Fisheries)

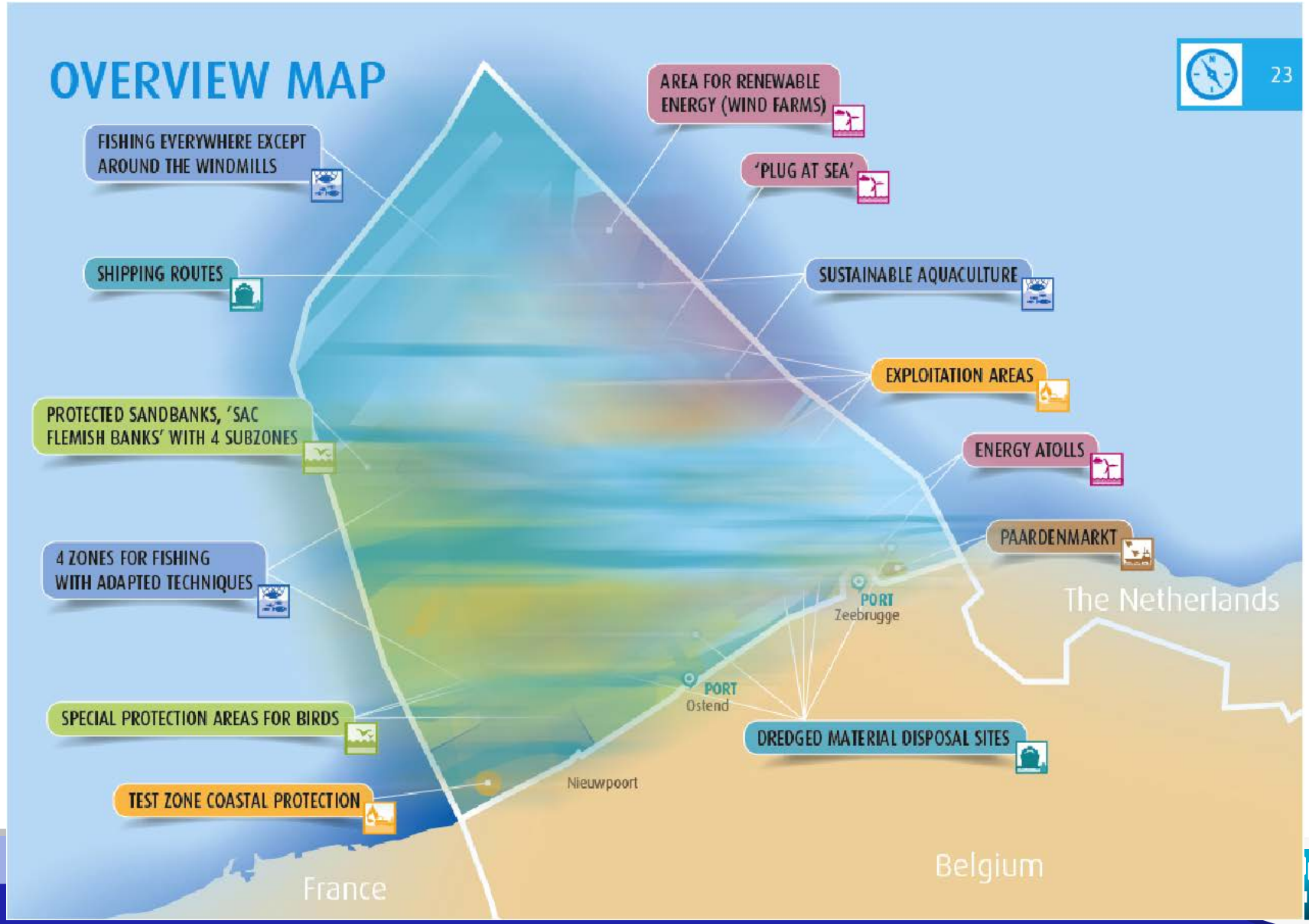


Base figure: NOAA

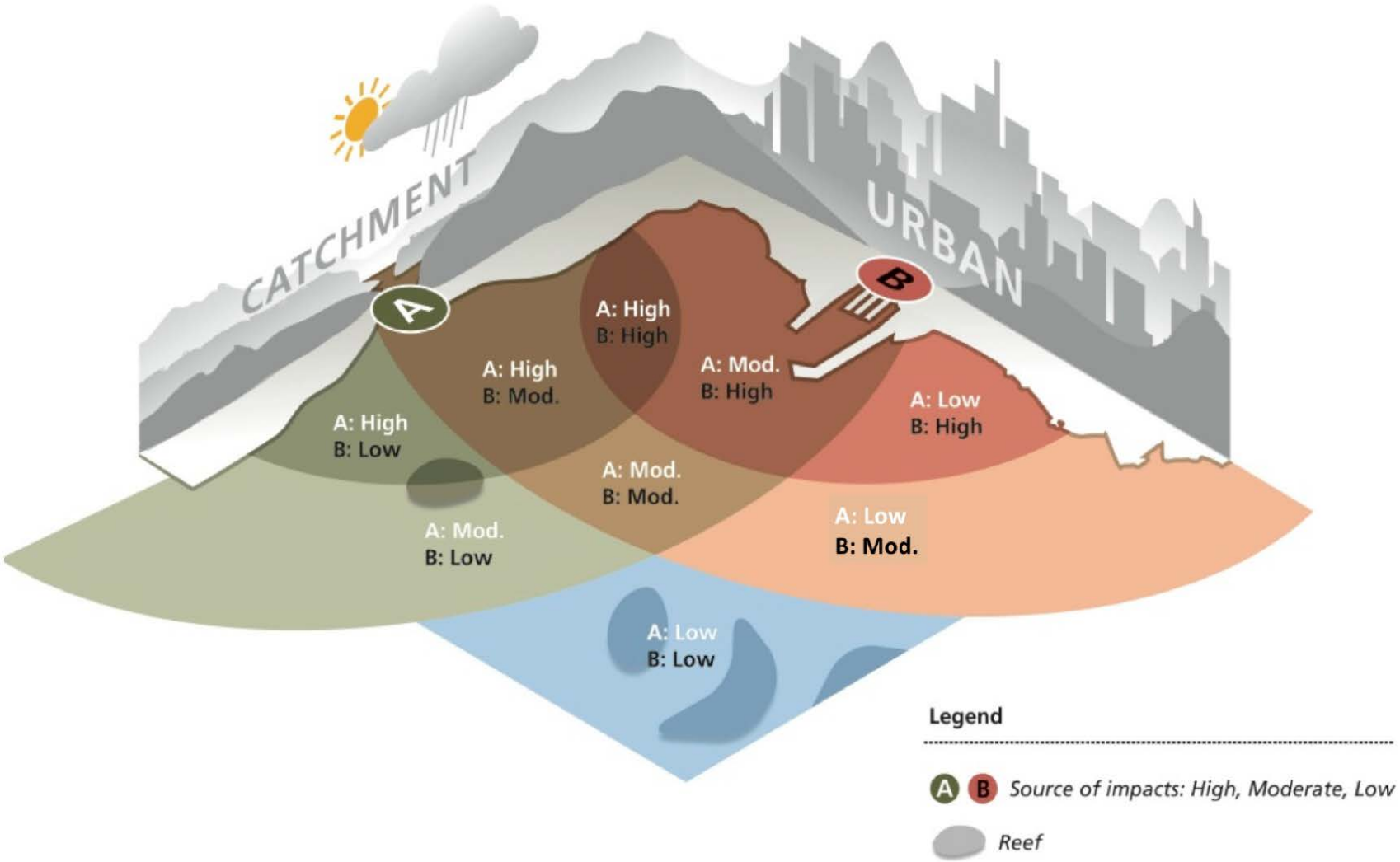
Conflicts & Resolution



Conflicts & Resolution… Maybe



Looking at cumulative risk & interactions



Anthony et al 2013

Problems

Simple

Clear problem
Clear solution

Predictable
Straightforward

Complex

Problem unclear
Solutions possible with time

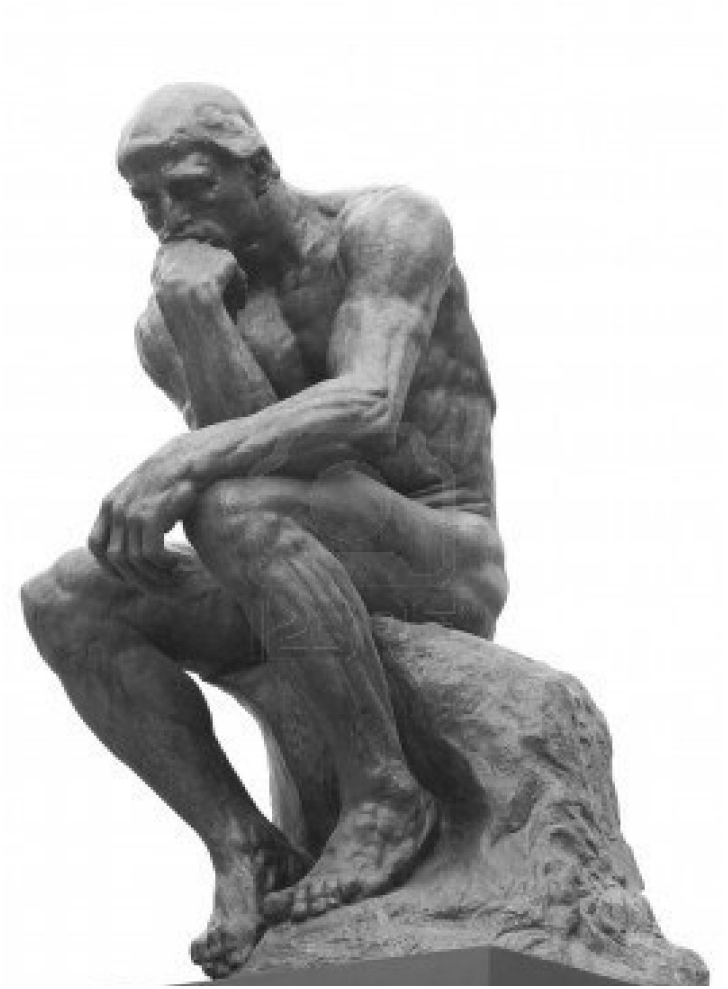
Many elements
Non linear
Linked parts

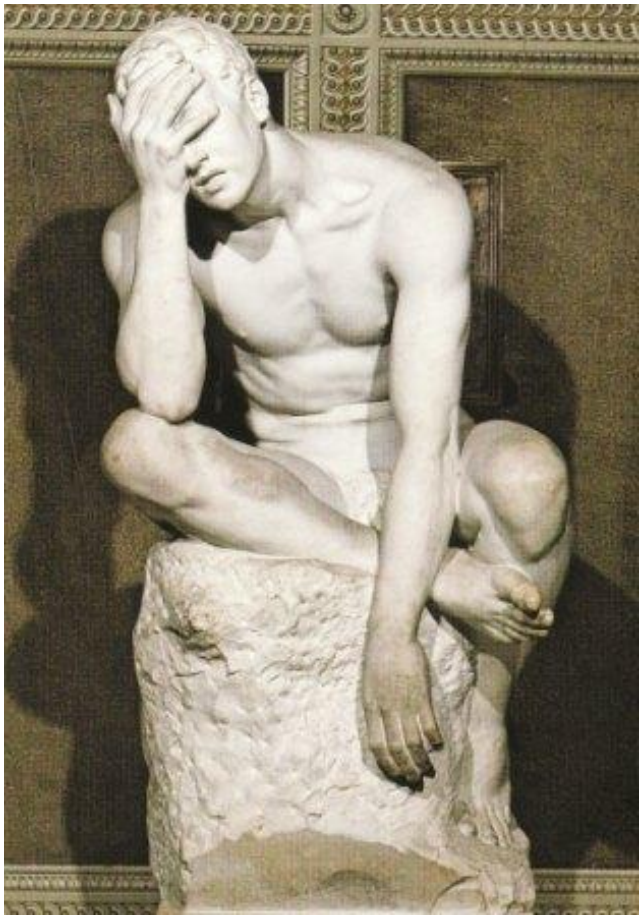
Wicked

Problem & solutions keep shifting

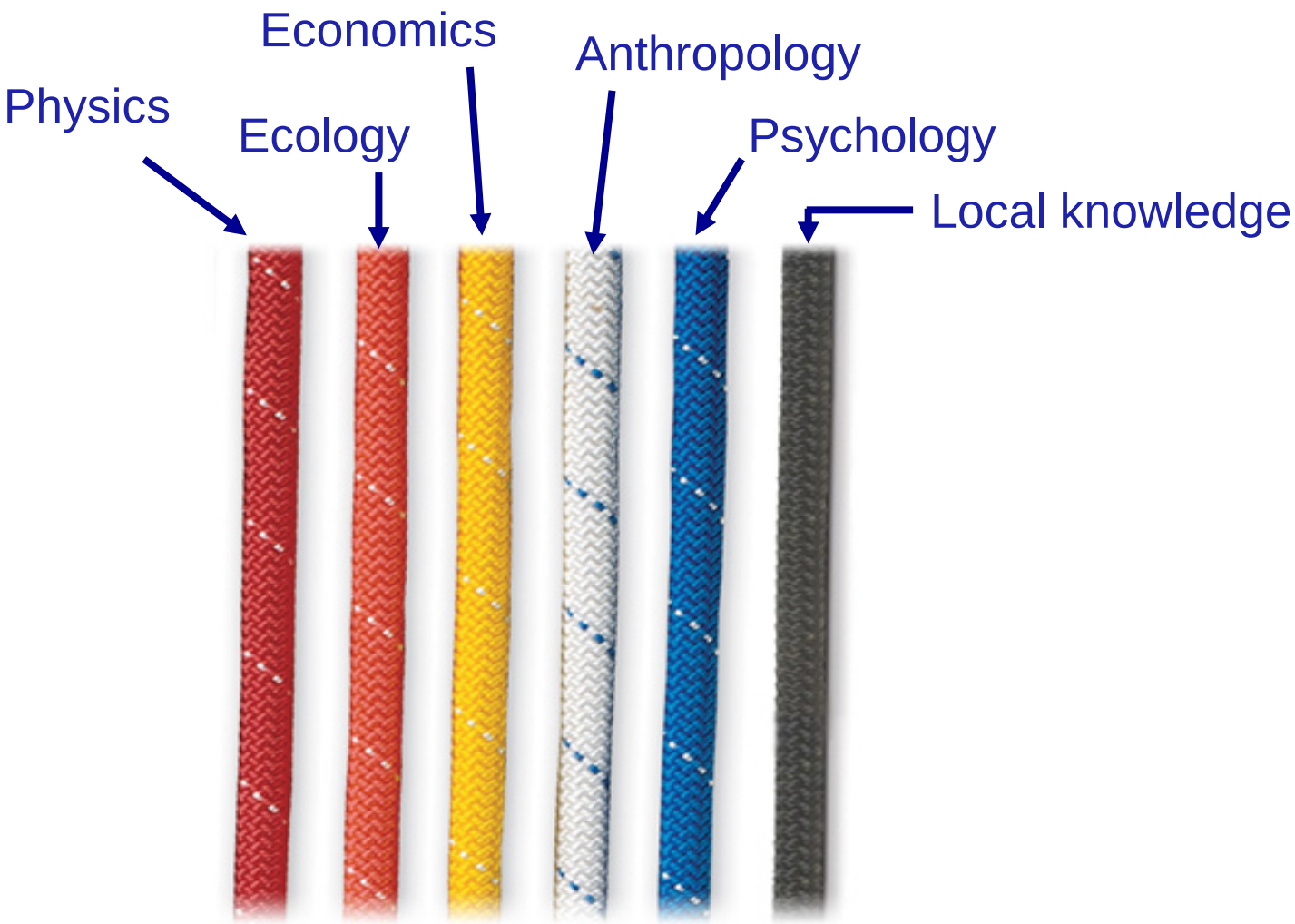
Many elements
Conflicting perspectives
No “right” answer
Last fix = new problem
Never complete
Changing beliefs & behaviour

Systems = Consideration of options …unfortunately





Traditional Approach: Focus on What You Know



Transdisciplinary Focus

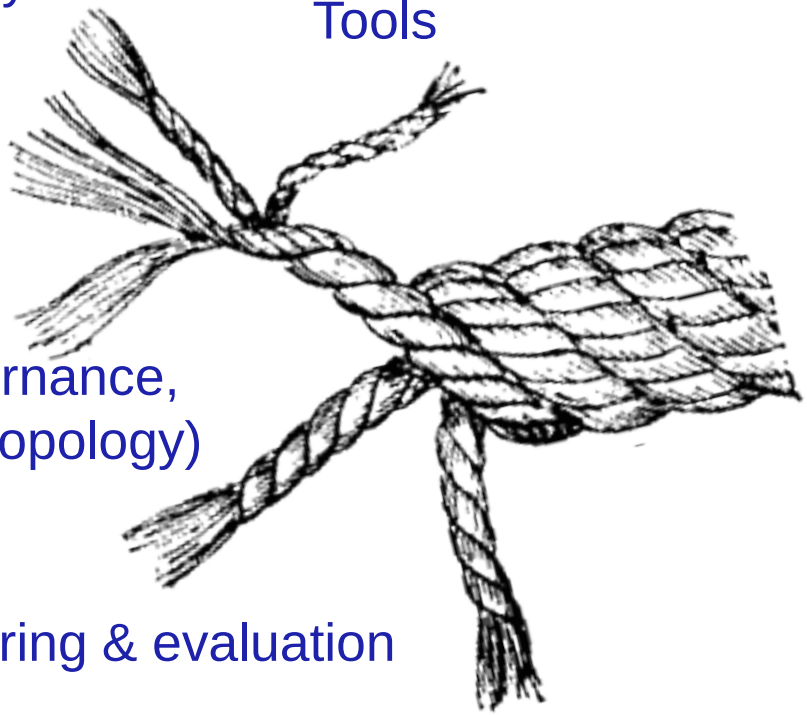
Disciplinary **Synthesising** **Integrated**

Ecology

Tools

Physics
(climatology,
oceanography)

Social sciences
(economics, governance,
psychology, anthropology)



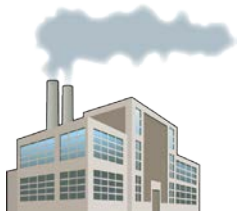
Monitoring & evaluation

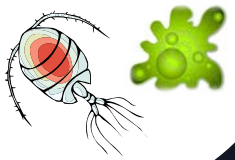
Stakeholders

By Our Very Nature….

- Tend to focus on what we know
- Cycle of eternal refinement….

Physicist's View





Biologist’s View

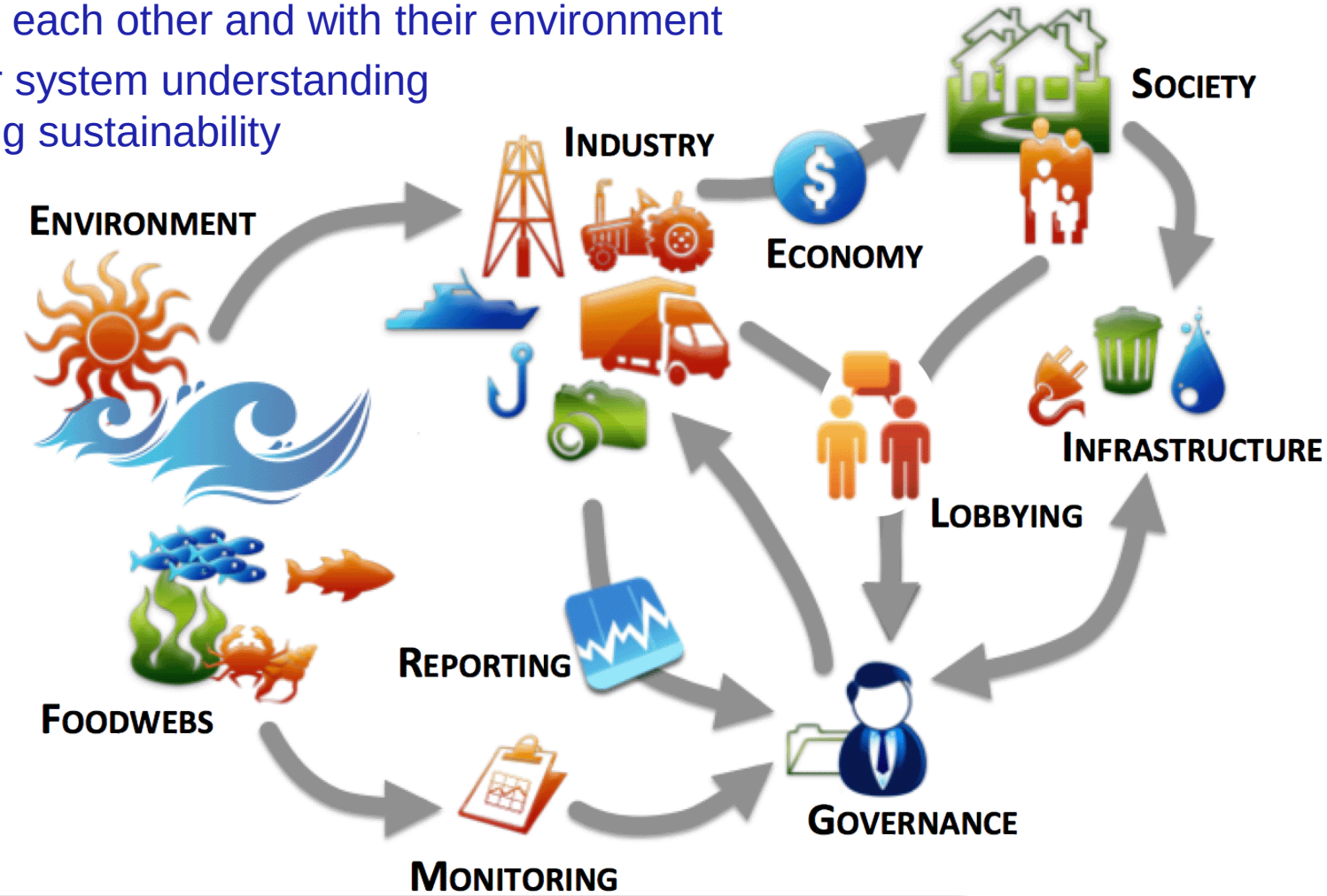
The humanities' view

Broader Can Help

Connections & the broader view can be important

Socioecology (or social-ecological)

- The study of entire systems, particularly the interaction of humans with each other and with their environment
- Important for system understanding and delivering sustainability

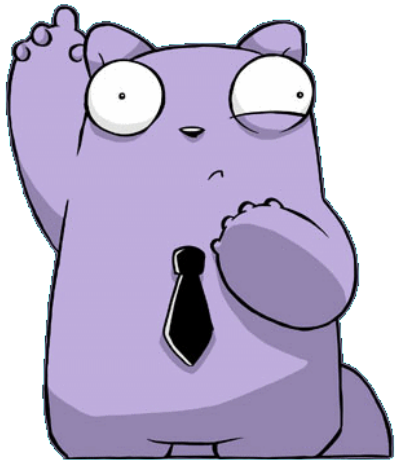


Engagement of Knowledge Systems

- Expanding appreciation & integration
- Participatory

Lost in translation

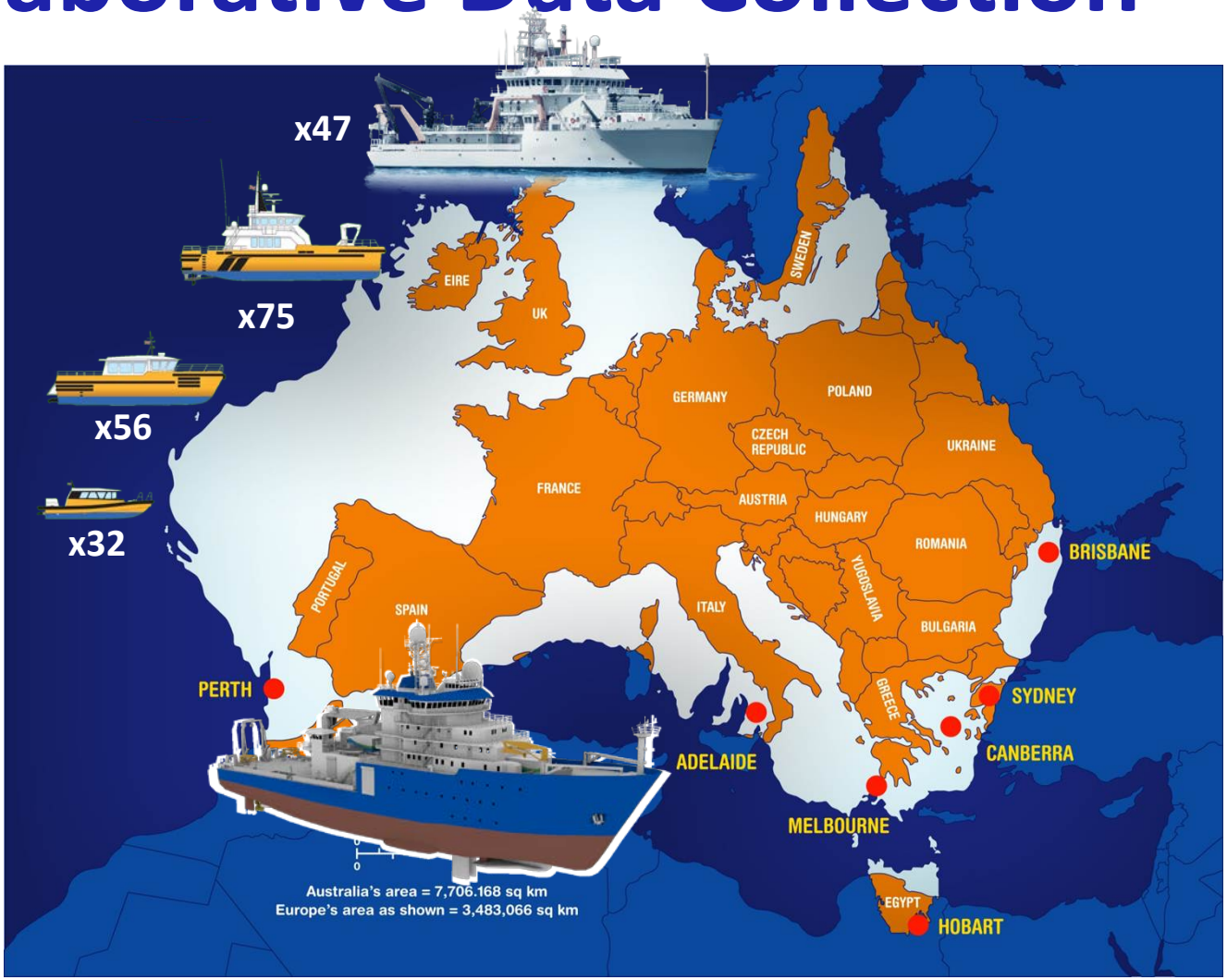
No comprende….



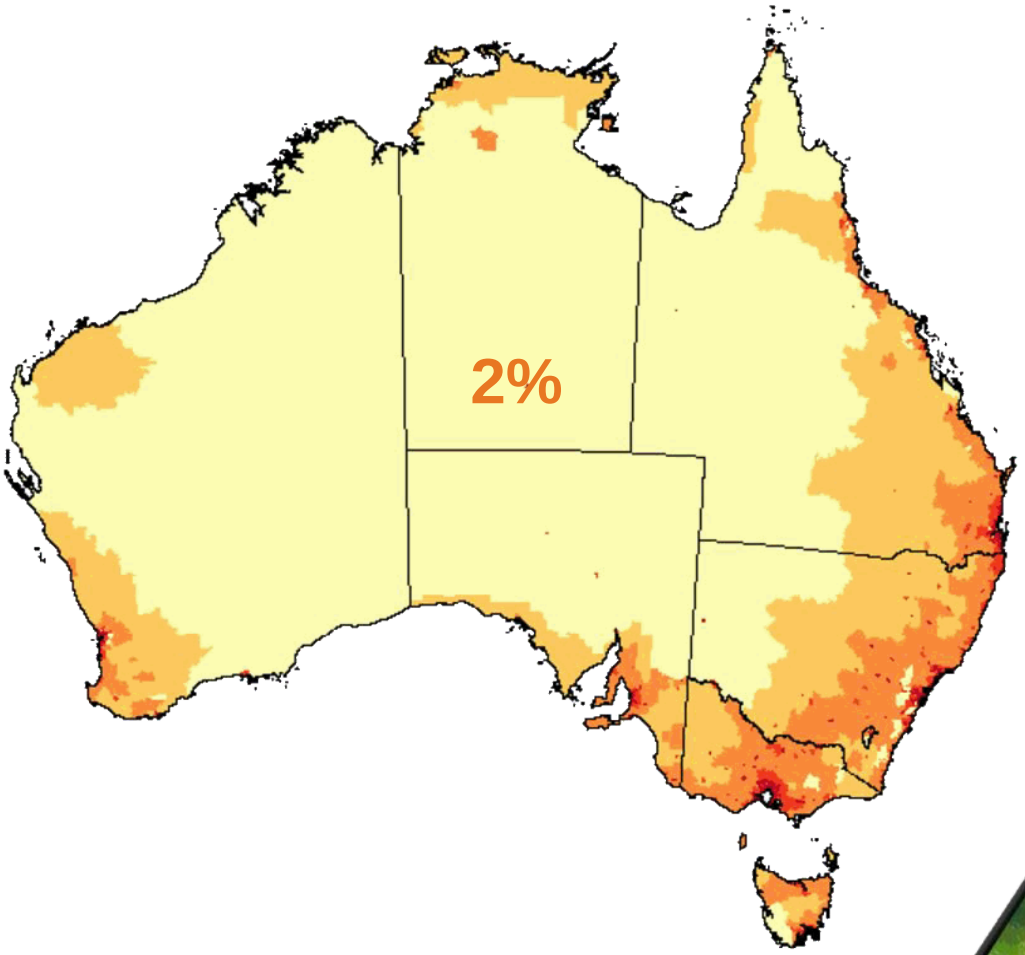
- Speak like a human being!!!!

Geomorphic provinces and surficial sediments	Seabed types
Elasmobranch faunal composition	Kinds of sharks and rays
Biodiversity on the contours of the bottom in deepwater areas	What lives on the seafloor

Collaborative Data Collection



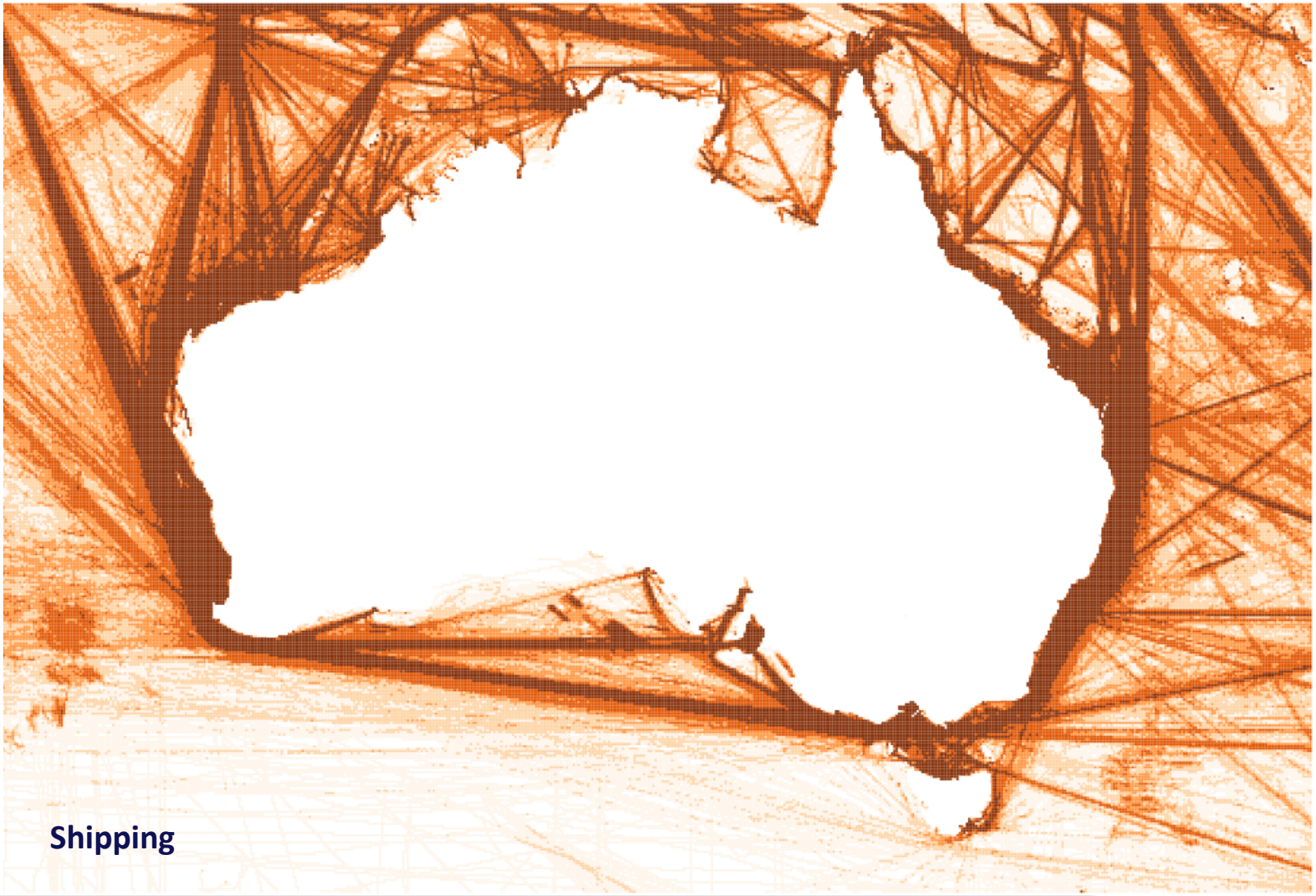
Collaborative Data Collection



Map: ABS

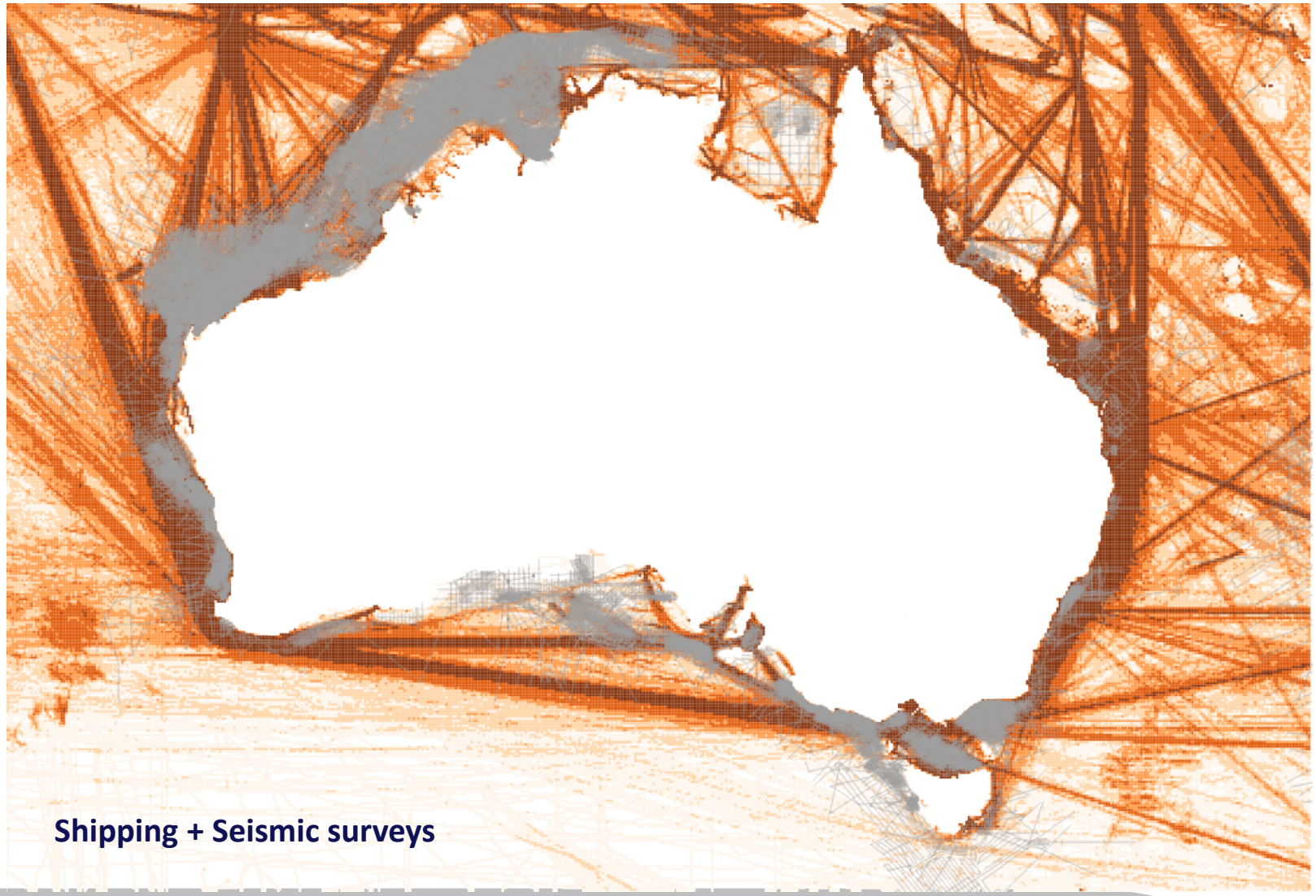
Citizen Science - Population

Collaborative Data Collection



Data: SoE 2016

Collaborative Data Collection



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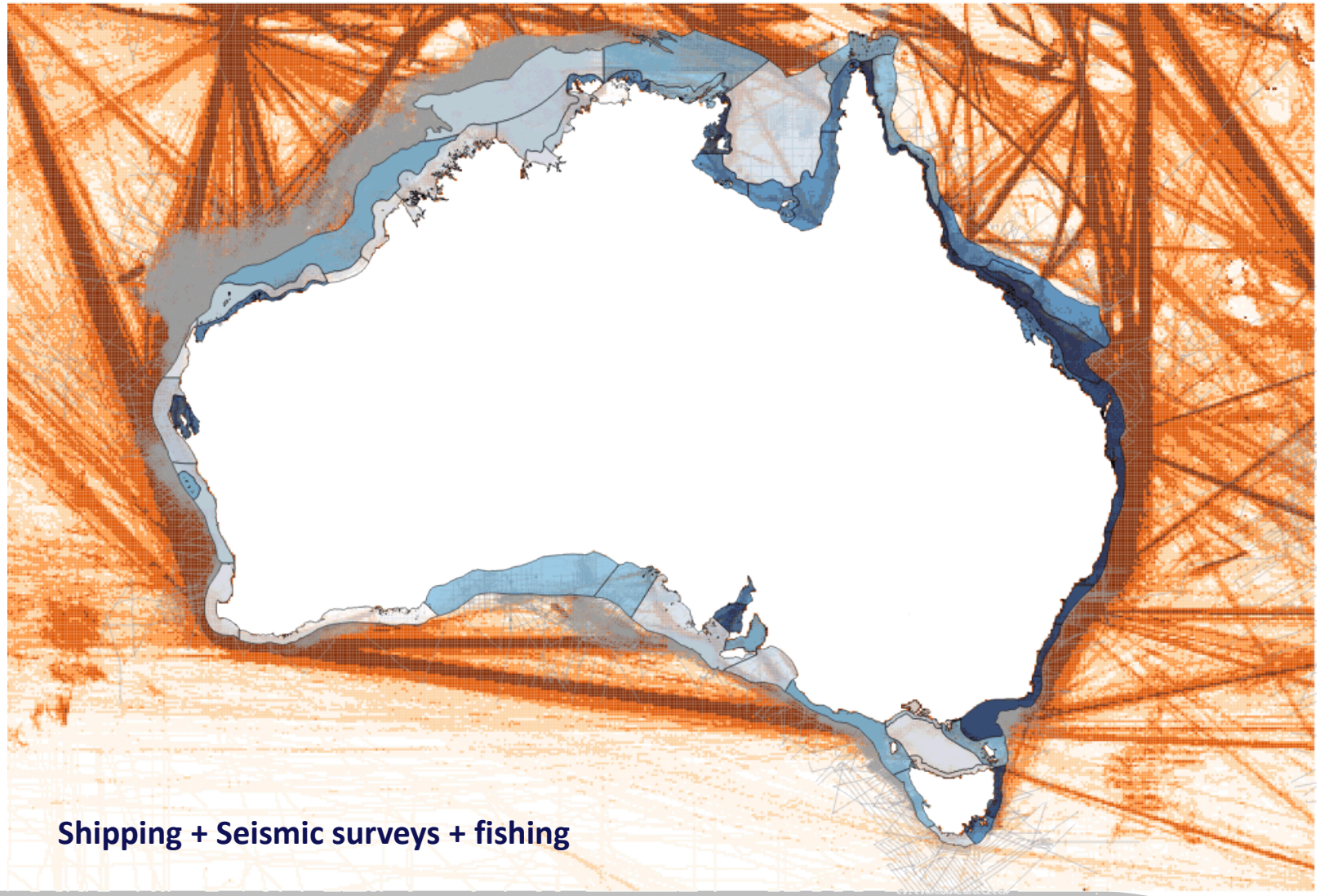

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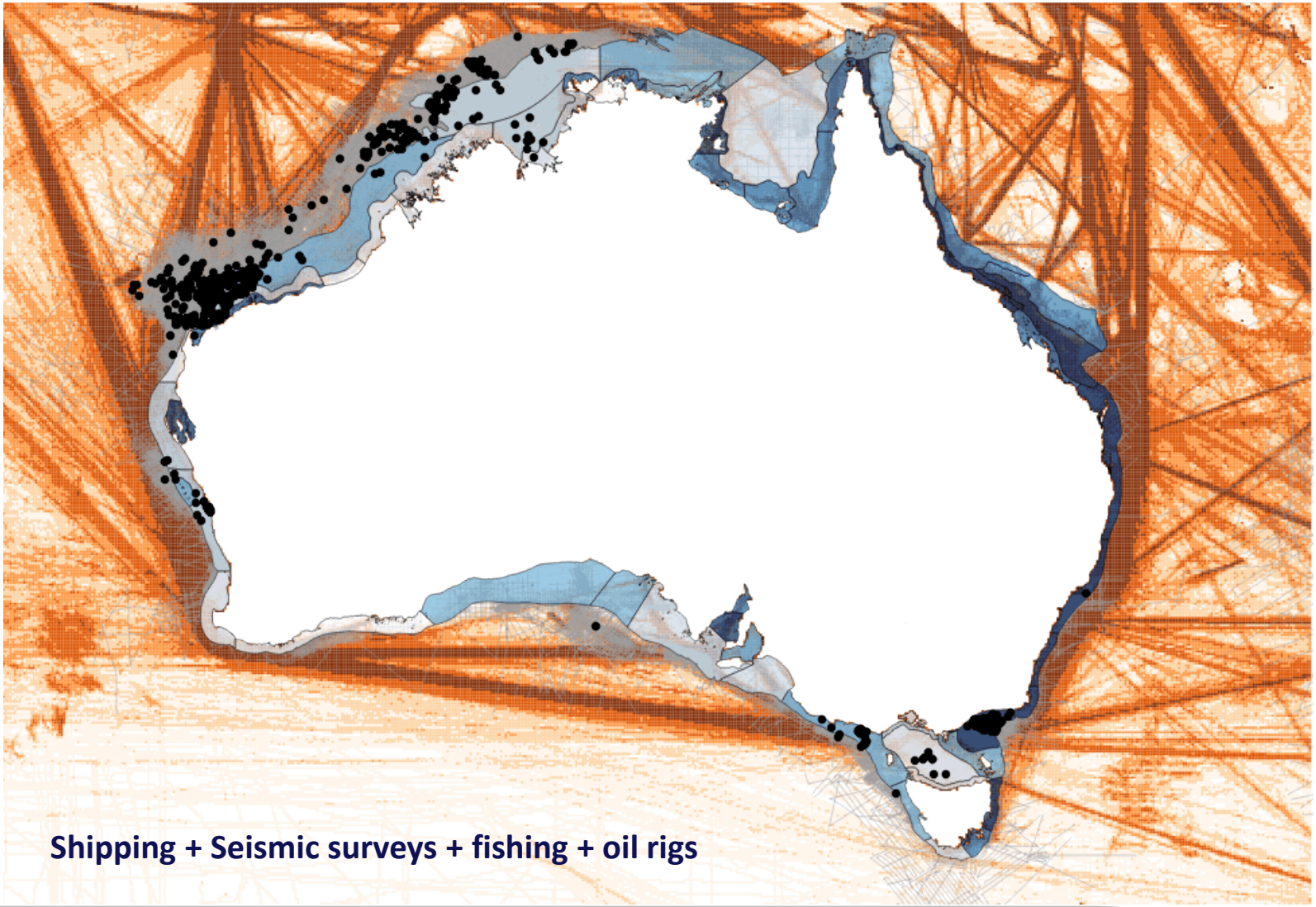

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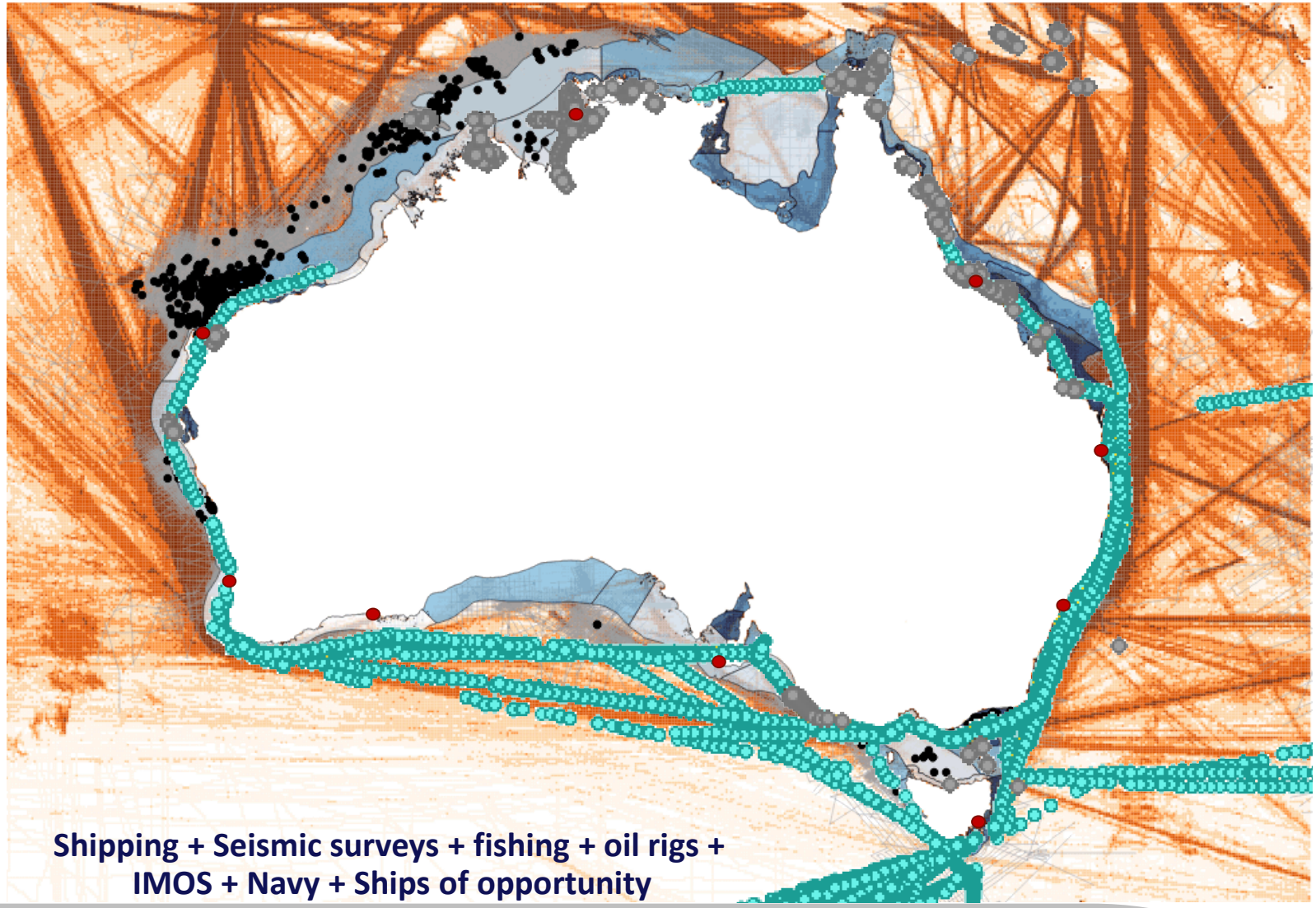
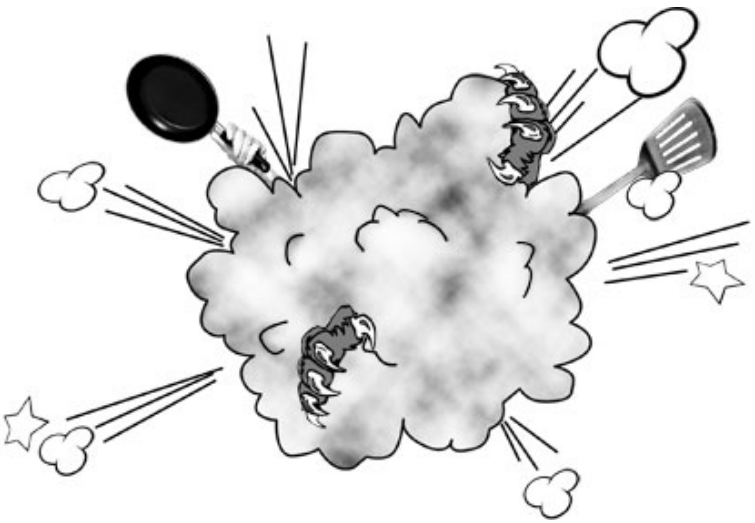


Data: SoE 2016

Jurisdictional Complications



- Theory vs Practice
- Time poor & high staff turn over
- Champions are hard to find…

Dealing with Complexity

Who Is Involved?

- 75 disciplines & backgrounds

Staged Approach to Considering Risk

Planning, Scoping, Problem Formulation

- Identify issues, resources, stressors, pathways of concern
- Define time scale of assessment
- Define spatial scale of assessment
- Select appropriate level of effort for assessment

Analysis

- Identify key cause-and-effect mechanisms
- Estimate range of natural variability & relative condition
- Evaluate past, present & expected future activities
- Evaluate validity & sensitivity of predicted effects

Interpretation & Risk Characterisation (Management Phase)

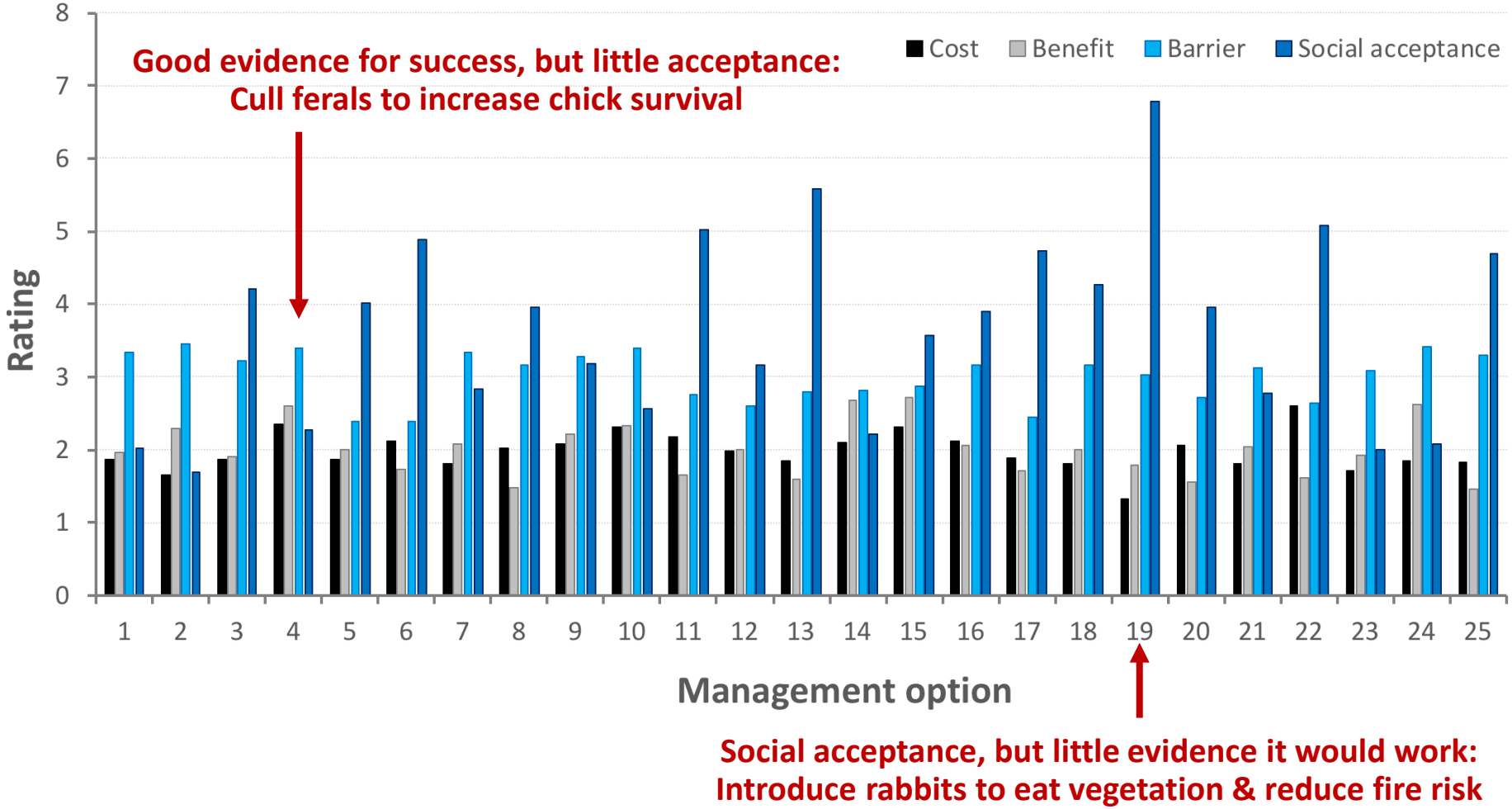
- Risk estimates communicated (significance & reliability)
- Identify modification, mitigation, planning & restoration options
- Identify key data gaps and monitoring needs

EPA 2003, MacDonald 2000

CSIRO

Solutions Oriented

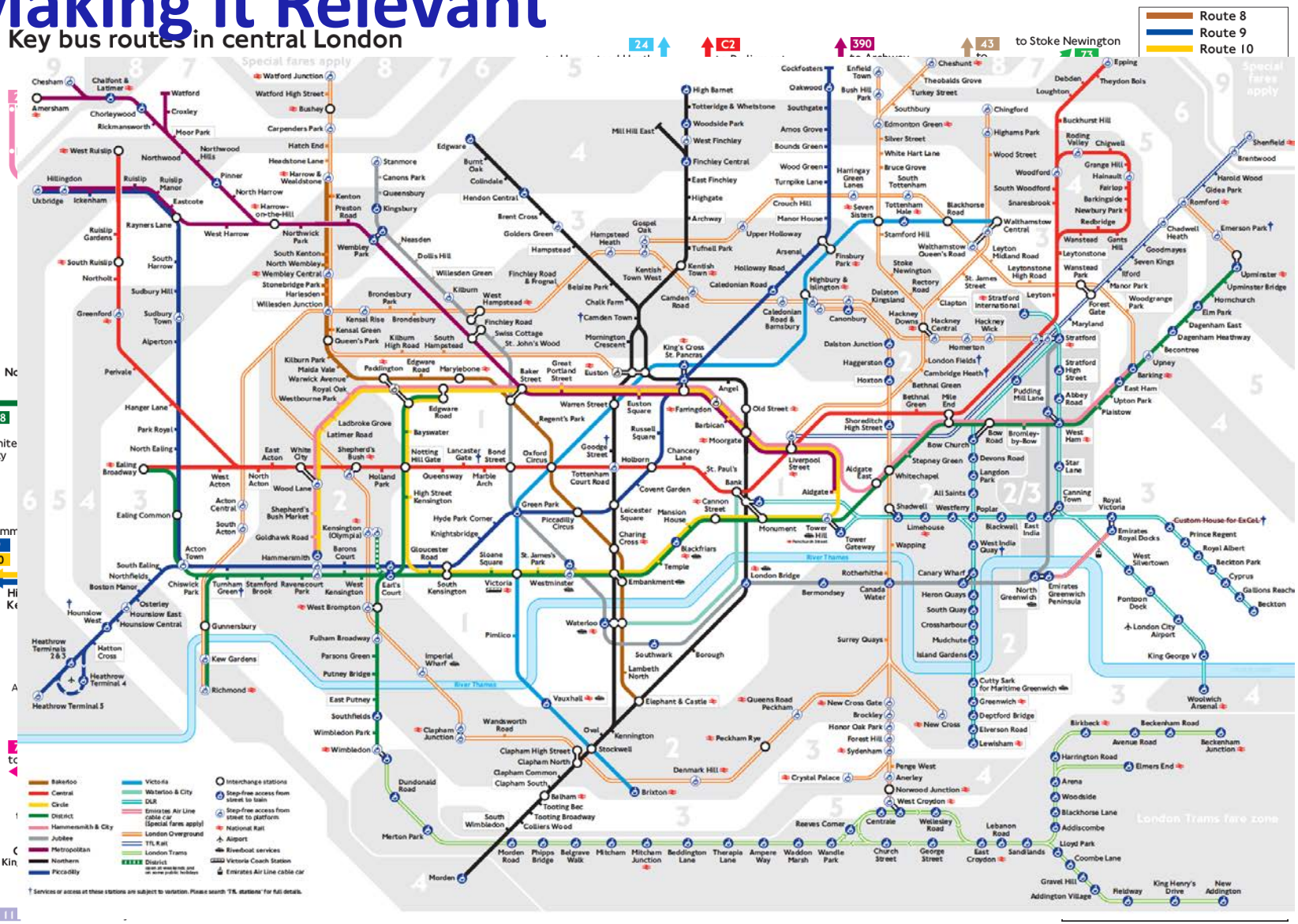
Evidence Based Acceptable Options



Hobday et al 2015

Making it Relevant

Key bus routes in central London



Time the scarcest resource…

- And lack of resources…

The Good and The Bad

- When it works, it works very well

True integration

- More than box ticking
- Tiramisu score

Summary

1. The marine world is expanding fast
2. Big challenges = all work together to solve
3. <u>When</u> it works, it is very useful
4. Start from disciplinary strength but have an open mind
5. Communicate well
6. Be patient, tolerant
7. The inspiration & advance comes from cross-fertilisation

Image: National Geographic

Thank you

Image: alamy.com

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