Torres Strait futures
Climate change and EGS

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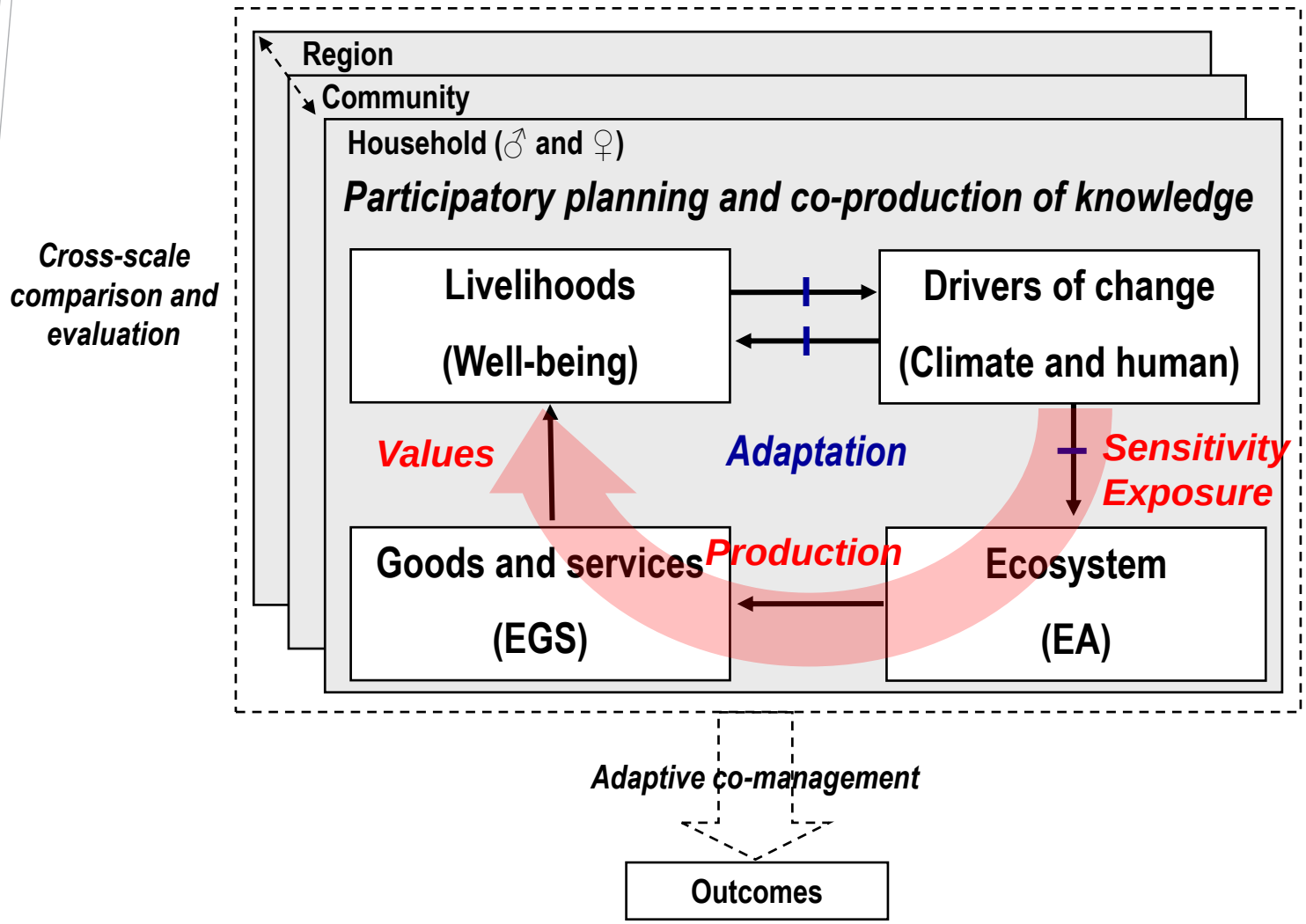
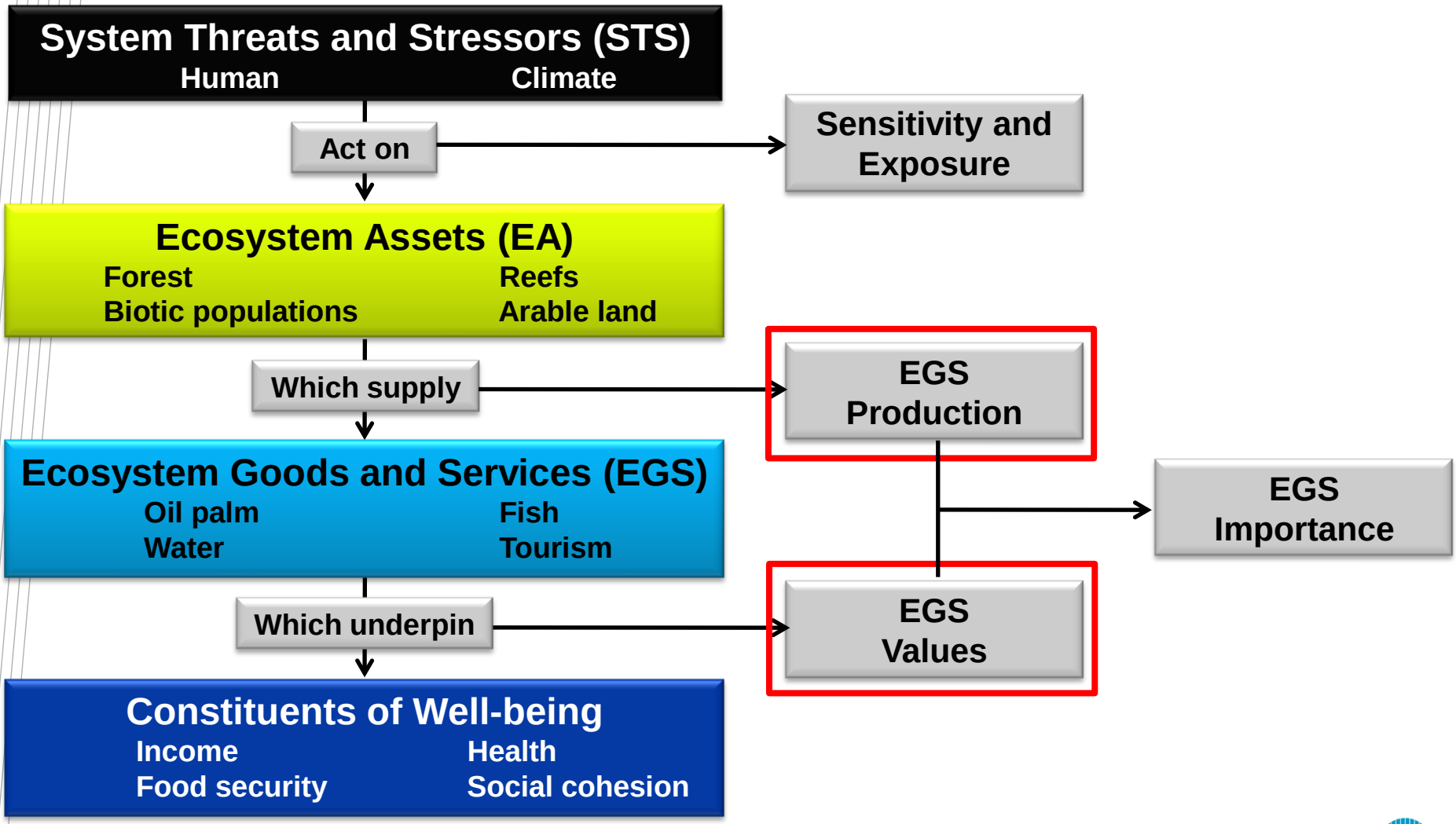
Glossary

- System Drivers and Pressures (SDP)
  - Human (Resource use, Land use, Pollution)
  - Climate (Temperature, Rainfall, Sea level rise, Ocean acidification)
- Ecosystem assets / Habitats
  - Coral Reefs
  - Agricultural land
  - Forest
- Ecosystem goods and services (EGS)
  - Fish
  - Oil palm
  - Water
- Constituents of well-being (CoWBe)
  - Health
  - Income
  - Food security
  - Cultural (social cohesion)

Conceptual diagram



Modelling approach

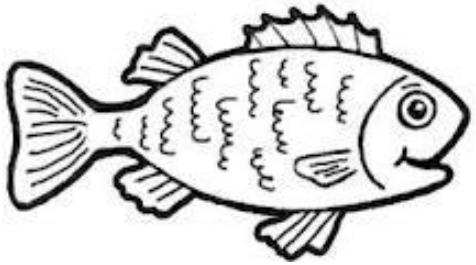
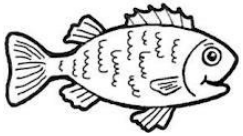
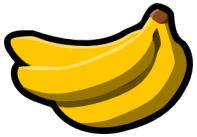


1. Relative Production EGS in each community

1. What are the EGS that communities use
   - Add any missing ones
2. Score EGS Production:
   - 0 = no production
   - 1 = very small production in LLG
   - 5 = greatest production in LLG

EGS Production

Production of each EGS in LLGs of WNB (1 – 5)

EGS			Production score
Fish		1,000 t →	5
		50 t →	3
Bananas		50 t →	3
		1 t →	1

1. Communities Production - EGS List

	Scores (5=greatest to 0=none)		Australia - Torres Strait									
			Production (0-5)									
	Habitat	EGS	Badu	Boigu	Dauan	Erub	Hammond	Yam	Kubin	Mabuiag	Masig	Mer
1	Agricultural	Banana										
2	Agricultural	Betel nut										
3	Agricultural	Cassava										
4	Agricultural	Chickens										
5	Agricultural	Coconut										
6	Agricultural	Garden vegetables										
7	Agricultural	Mangoes										
8	Agricultural	Pawpaw										
9	Agricultural	Pigs (domestic)										
10	Agricultural	Rice										
11	Agricultural	Sago										
12	Agricultural	Sweet potato										
13	Agricultural	Taro										
14	Agricultural	Yams										
15	Estuarine	Barramundi										
16	Estuarine	Barramundi (aquaculture)										
17	Estuarine	Crabs (blue)										
18	Estuarine	Crabs (mud)										
19	Estuarine	Crocodiles										
20	Estuarine	Crocodiles (farmed)										
21	Estuarine	Finfish coastal (trevally, mullet etc)										
22	Estuarine	Mangrove timber										

1. Communities EGS Production (0-5)

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	Habitat	EGS	Badu	Boigu	Dauan	Erub	Hammond	Yam	Kubin	Mabuiag	Masig	Mer
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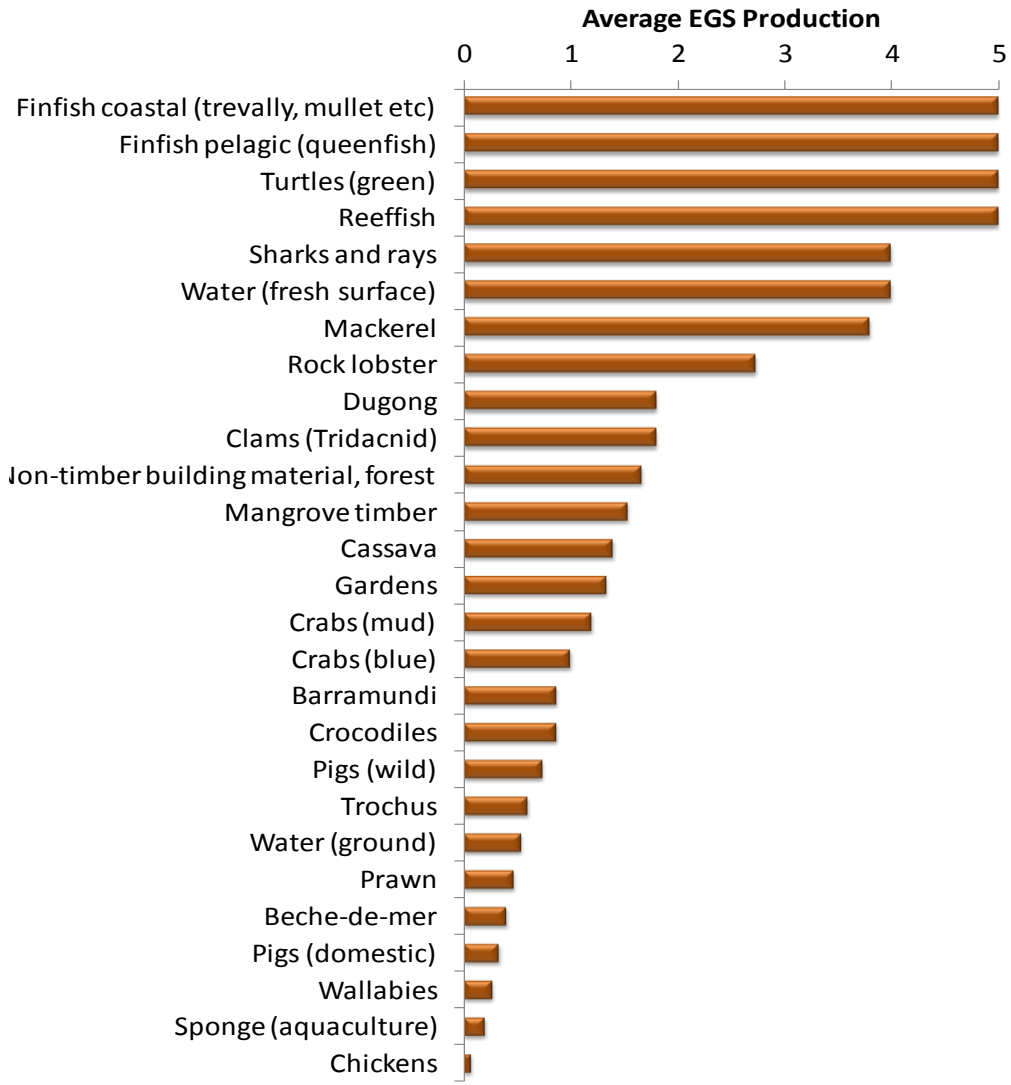
Torres Strait community - Production scores

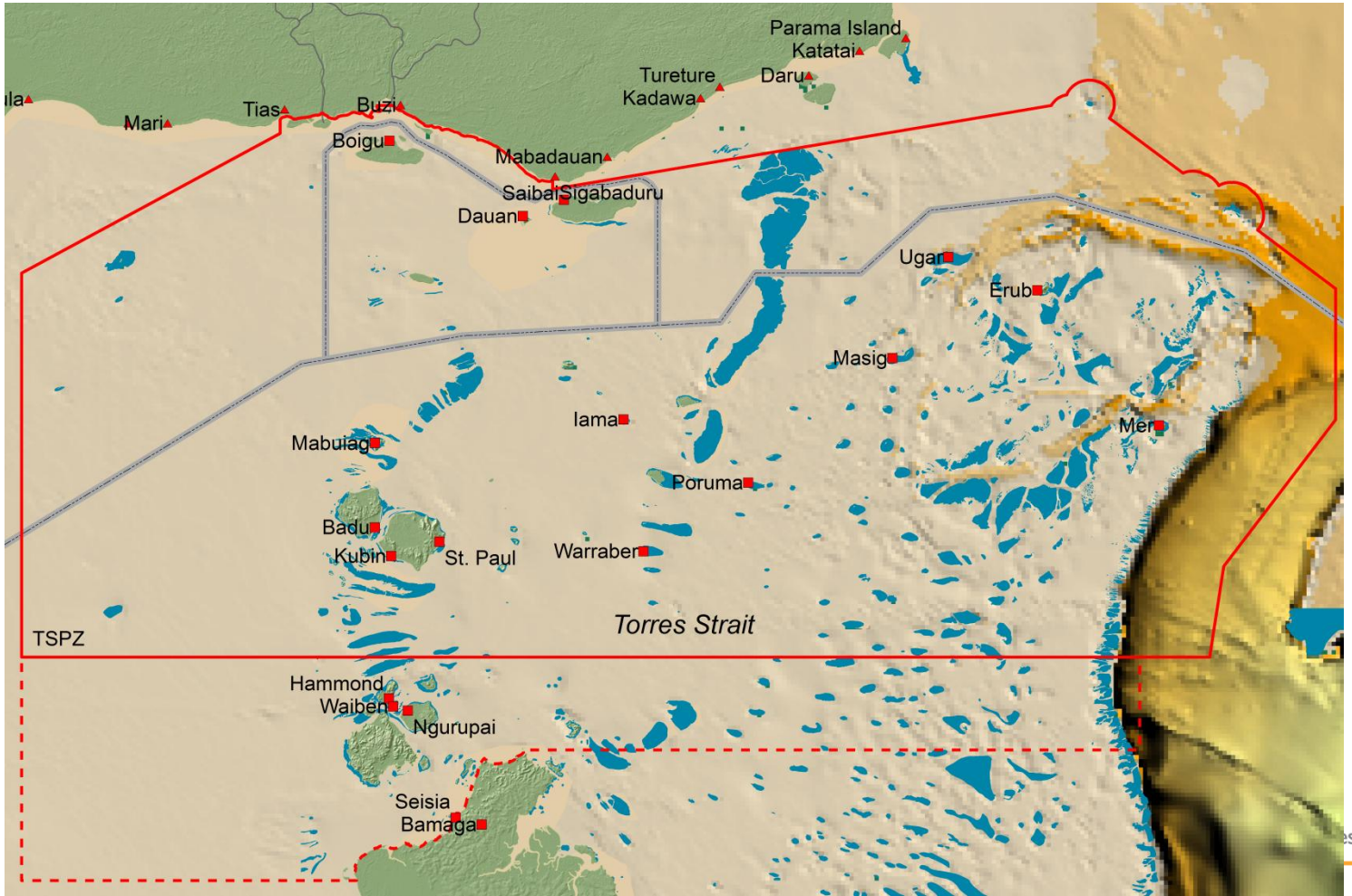
Torres Strait Regional Authority

Averaged across the 15 Communities



15 Communities in the Torres Strait

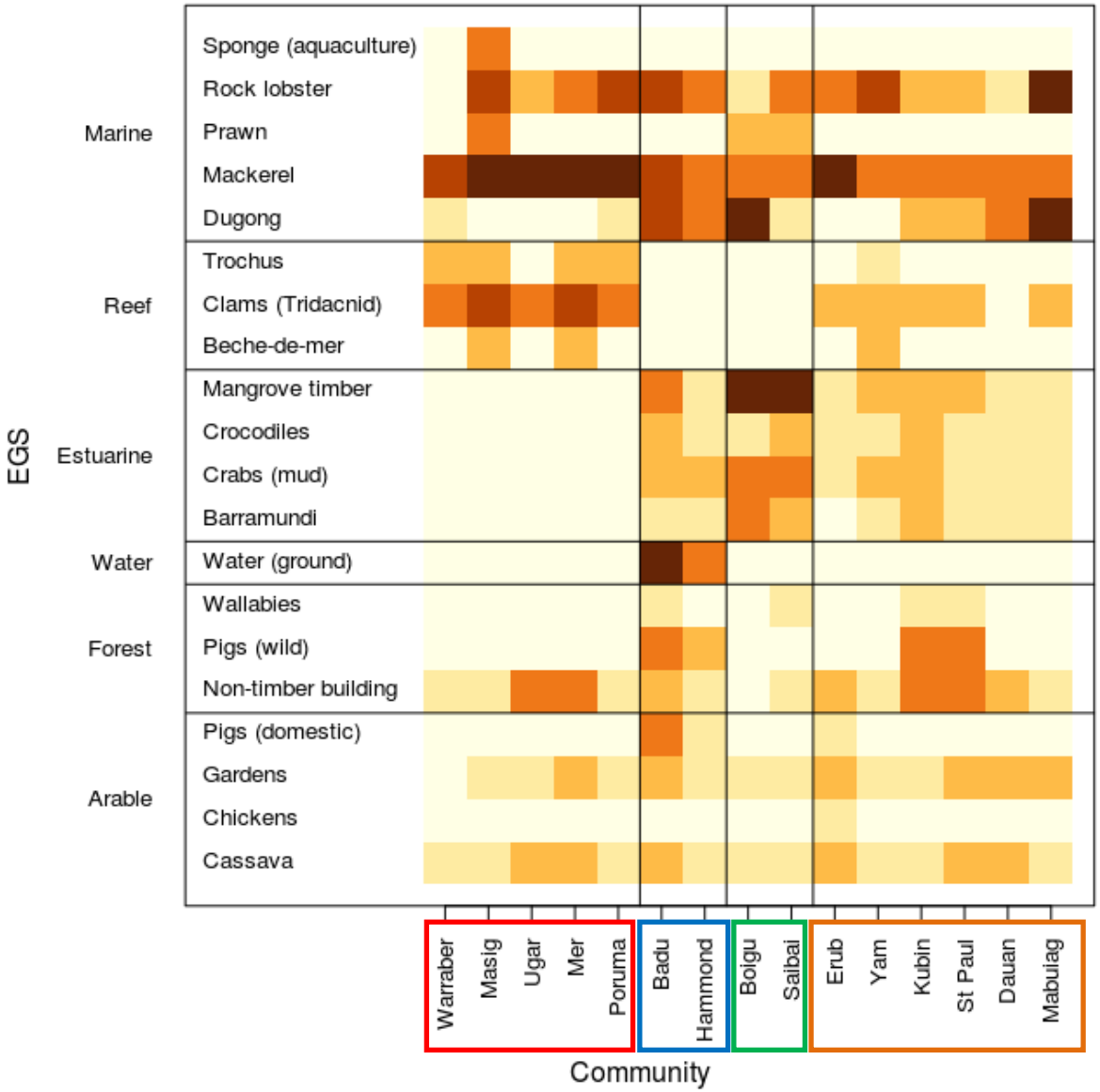
14 Communities in the TSPZ: Badu, Boigu, Dauan, Erub, Yam, Kubin, Mabuiag, Masig, Mer, Poruma, Saibai, St Paul, Ugar, and Warraber
1 Community outside the TSPZ: Hammond



Australian and PNG Production values

	Country	
Habitat	Aus.	PNG
Agriculture	0.2	2.2
Estuarine	1.3	2.7
Forest	0.4	2.1
Freshwater	0.9	2.2
Marine	1.5	1.3
Reef	1.5	1.7

T.S. (Aust.) EGS Typologies



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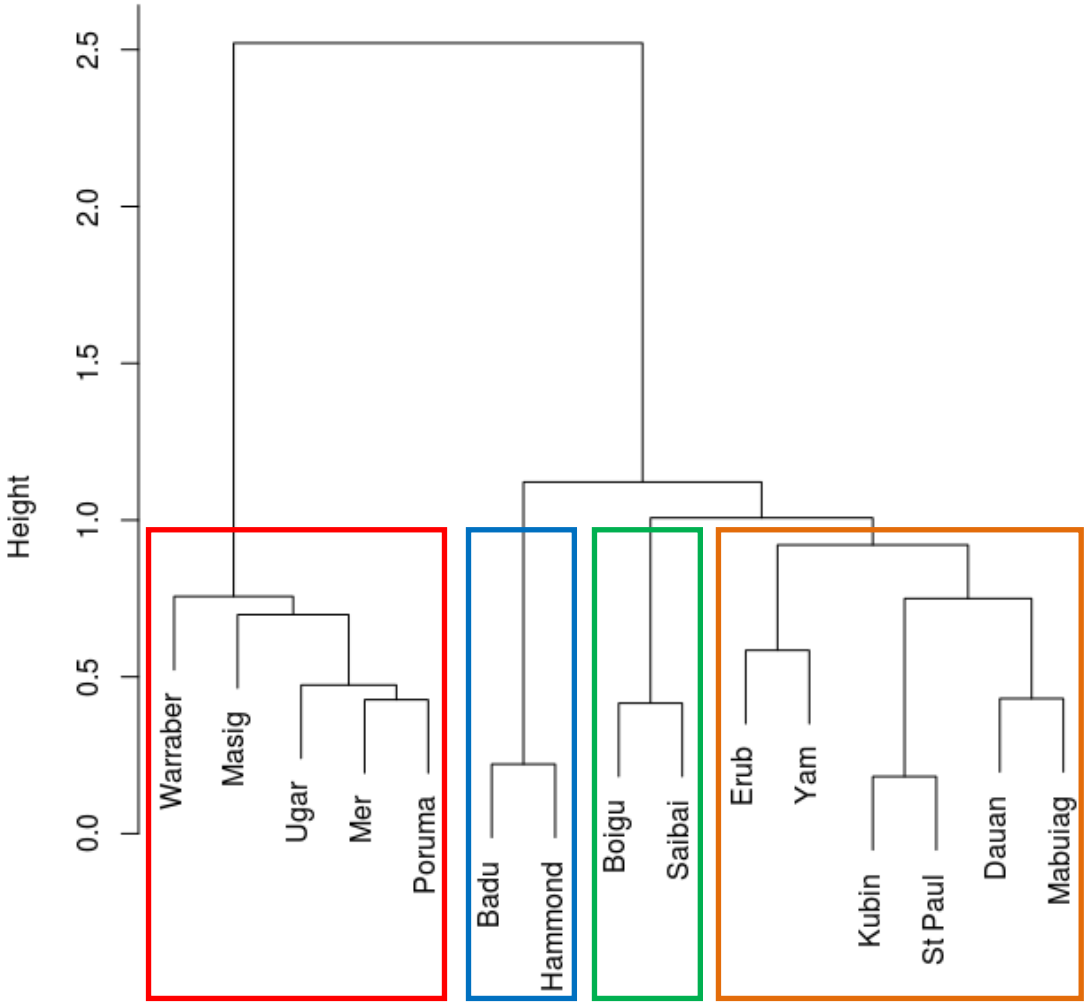


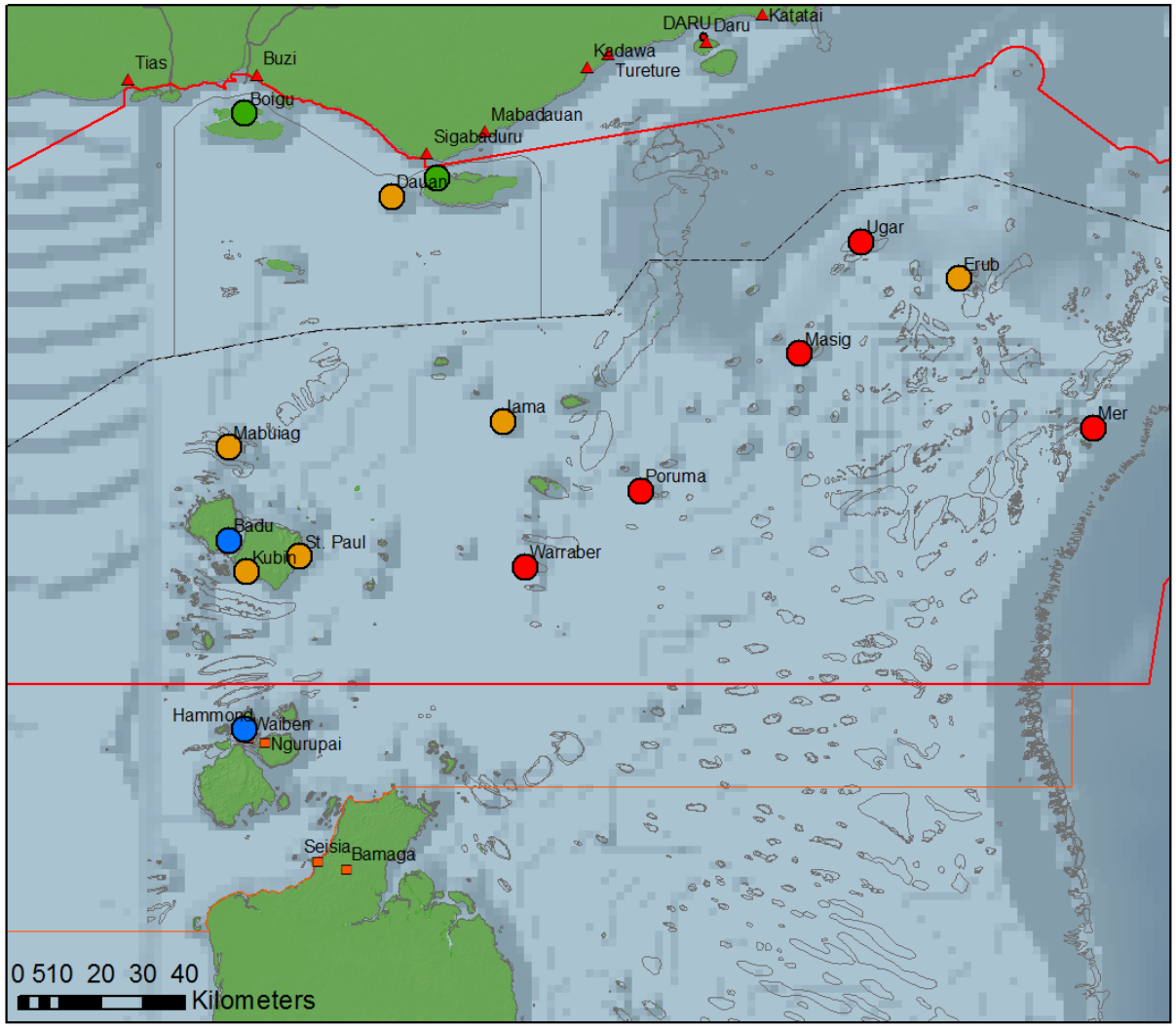
T.S. (Aust.) EGS Typologies

- Type1: Reef
  - Masig
  - Mer
  - Poruma
  - Ugar
  - Warraber
- Type 2: Agriculture and marine
  - Badu
  - Hammond
- Type 3: Estuarine and marine
  - Boigu
  - Siabai
- Type 4: Mixed
  - Dauan
  - Erub
  - Yam
  - Kubin
  - Mabuiag
  - St Paul

	Cluster			
Habitat	1	2	3	4
Arable	0.60	1.25	0.50	0.88
Estuarine	1.00	2.08	3.00	1.83
Forest	0.60	1.50	0.33	1.11
Marine	2.71	2.93	2.86	2.60
Reef	2.96	1.80	1.80	2.23
Water	2.00	4.00	2.00	2.00

T.S. (Aust.) EGS Typologies

- Reef
- Agriculture and marine
- Estuarine and marine
- Mixed



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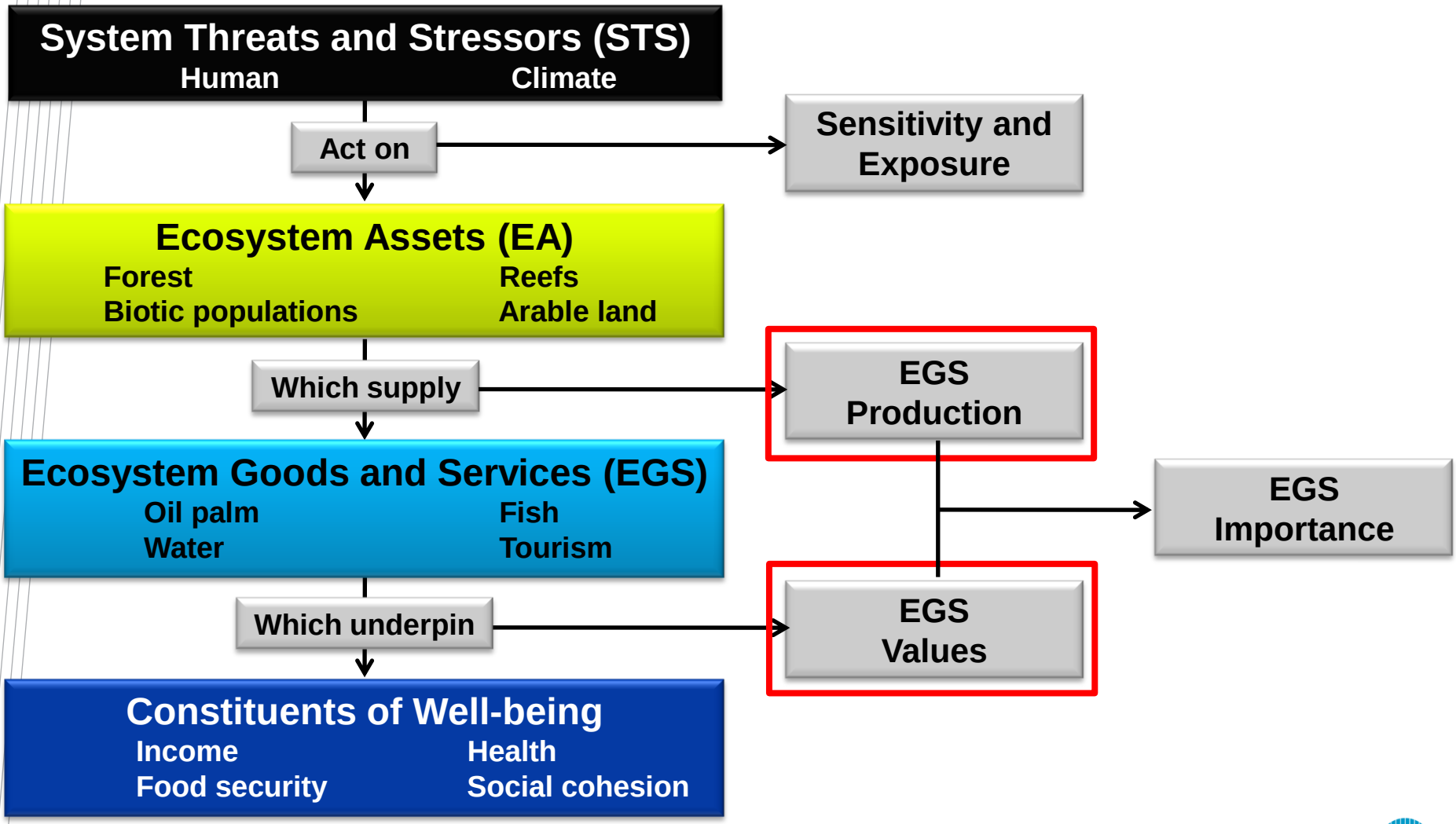
Modelling approach

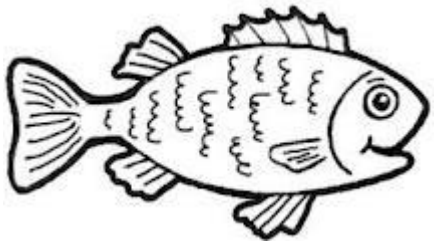


2. EGS values

- What is the value of each EGS to the 4 CoWBe
  - Income
  - Health
  - Food security
  - Cultural (social cohesion)
- Assume you had same quantity of each EGS
  - E.g. a turtle, box of fish, box of timber
- What would be the value of that EGS to the 4 CoWBe
  - 0 (no value) to;
  - 5 (very strong value)

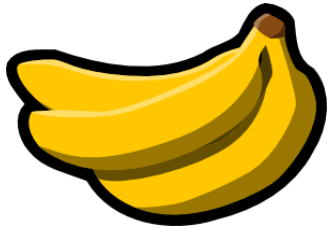
EGS Values to Well-being

Value of each EGS to the four Constituents of Well-being (CoWBe) in whole Torres Strait (0 – 5)



Reef Fish

Income	3
Cultural	3
Food security	4
Health	3



Bananas

Income	1
Cultural	2
Food security	4
Health	3

EGS Values to Well-being

Value of each EGS to the four Constituents of Well-being (CoWBe) in whole Torres Strait (0 – 5)

Water

Income	0
Cultural	4
Food security	4
Health	4

Oil palm

Income	5
Cultural	2
Food security	0
Health	0

3. EGS - Well-being value

	Scores (5=greatest to 0=none)		Australia - Torres Strait			
			Importance (0-5)			
	Habitat	EGS	Income	Health	Food security	Social cohesian
1	Agricultural	Banana				
2	Agricultural	Betel nut				
3	Agricultural	Cassava				
4	Agricultural	Chickens				
5	Agricultural	Coconut				
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22	Estuarine	Mangrove timber				

Cultural

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CSIRO Wealth from Oceans Flagship
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Good science communication

- Transparent
  - Participatory planning approach
  - Coproduction of information (elicitation)
  - Real time analysis
  - Local (good quality) facilitators
- Relevant
  - Appropriate valuing of Impact measures (Livelihoods)
- Credible
  - Multidisciplinary
  - Local science partners
  - Appropriate science presentations
- Unbiased
  - Broad stakeholder forums

Cash et al. (2003)

Future developments

- Visualising uncertainty
- Testing robustness, scenarios.
- Valuing non-provisioning services
  - Biodiversity
  - Carbon Sequestration
  - Regulating services
- Assessing benefit from management strategies