



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

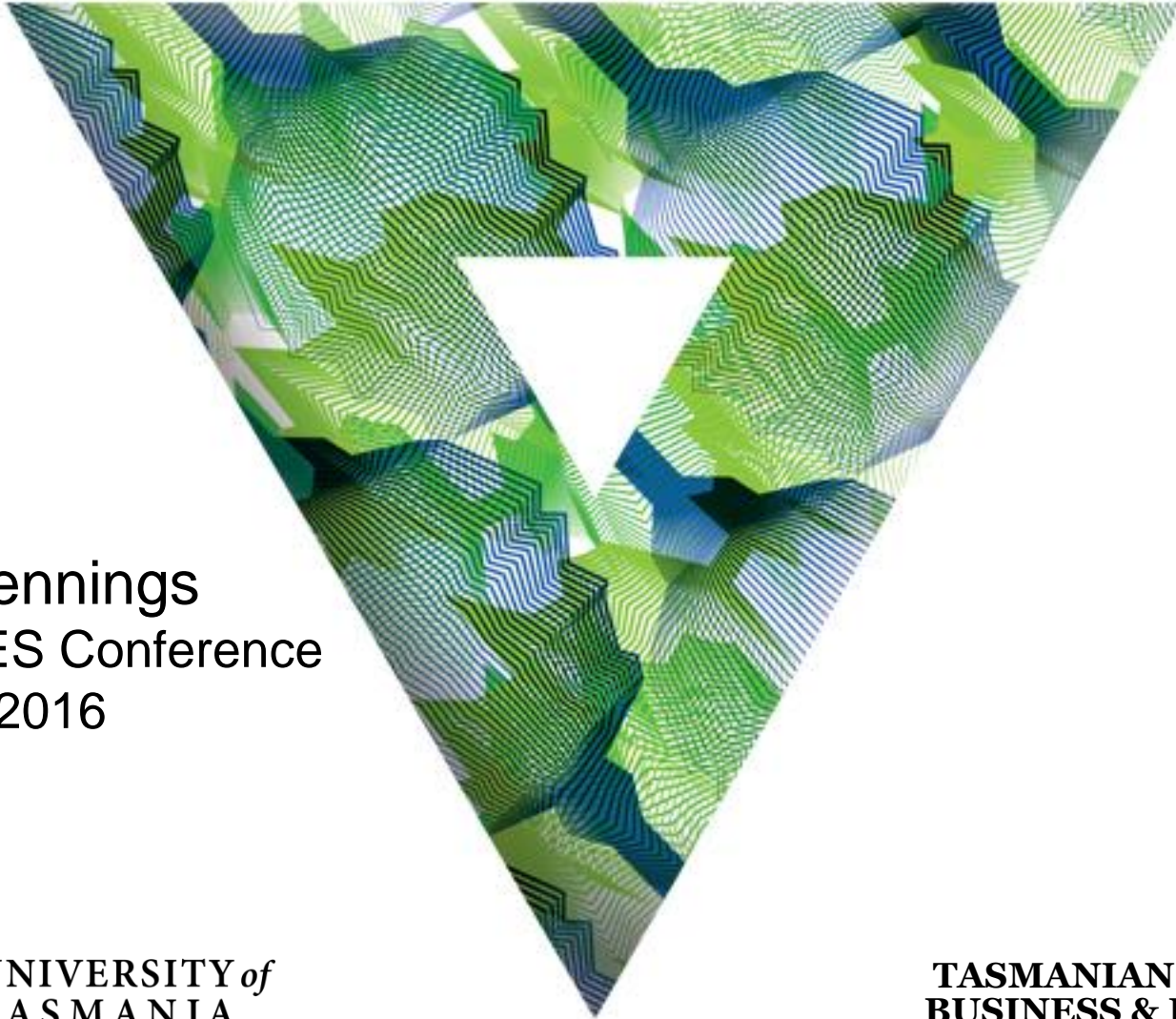
AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

Provisioning wild catch seafood in Australia's ocean economy: opportunities and challenges



Sarah Jennings
60th AARES Conference
February 2016
Canberra

Acknowledgements

Putting fisheries in the food bowl (*ANNiMS Springboard II Program*)

Growth opportunities & critical elements in the value chain for wild fisheries & aquaculture in a changing climate (*Marine NARP Project FRDC 2011/233*)

South East Australia Fisheries and Climate Change Project (SEAP)

&

Centre for Marine Socioecology, University of Tasmania

Roadmap

1. Global snapshot
2. Australian snapshot
3. Opportunities for growth in wild capture fish production
4. Challenges (the 'usual suspects' and some 'elephants in the room')

Global snapshot

Fish provides more than 4.5 billion people with at least 15 % of their average per capita intake of animal protein.

Fish provides more per capita protein than beef, pig or poultry and has accounted for more than 60% of growth since late 1960's

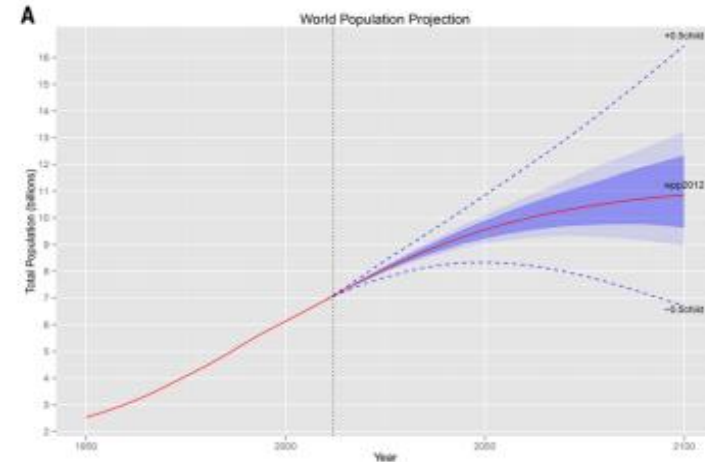
Fish's unique nutritional properties make it also essential to the health of billions of consumers in both developed and developing countries.

Fish is one of the most efficient converters of feed into high quality food and its carbon footprint is lower compared to other animal production systems.

Through fish-related activities, fish contribute substantially to the income and livelihoods of more than 10 % of the world population.

Global snapshot

In China, for example, the demand for fish is likely to increase from 24.4 kg per person per year in 2000 to 41 kg per person per year by 2030 (World Bank 2014).



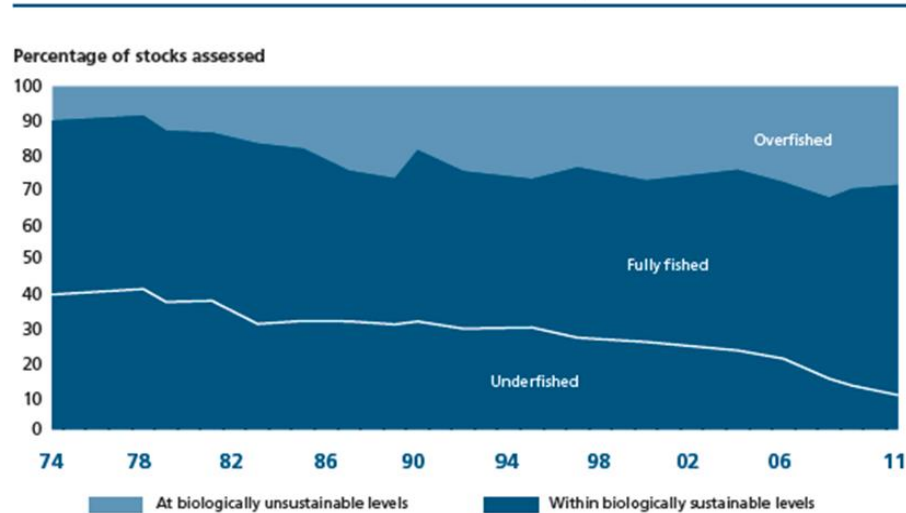
*“We project that if aquatic sources have to compensate for the projected declines in wheat or rice production, which are greatest in areas where livestock is of limited availability now and might decline further under many climate-change scenarios, **the necessary increase will be greater than 50% of current production**”. Garcia et.al. (2011)*

Global snapshot

“The world's fish and seafood populations will collapse by 2048 if current trends in habitat destruction and overfishing continue, resulting in less food for humans, researcher say.”

Figure 13

Global trends in the state of world marine fish stocks, 1974–2011

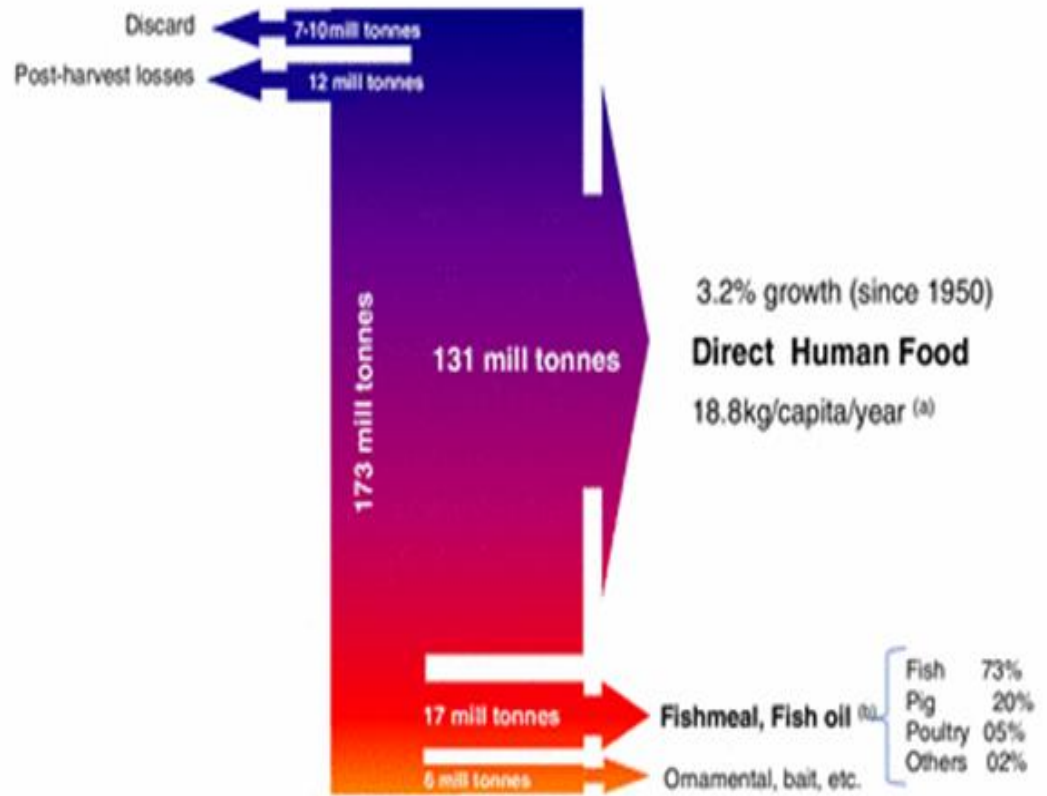


Notes: Dark shading = within biologically sustainable levels; light shading = at biologically unsustainable levels. The light line divides the stocks within biologically sustainable levels into two subcategories: fully fished (above the line) and underfished (below the line).

FAO, 2014

Global snapshot

Fig. 1 World fish utilization.
 Notes: **a** 2011 estimates, **b** 2010 estimates. Source data from FAO (2012) and Shepherd and Jackson (2013)



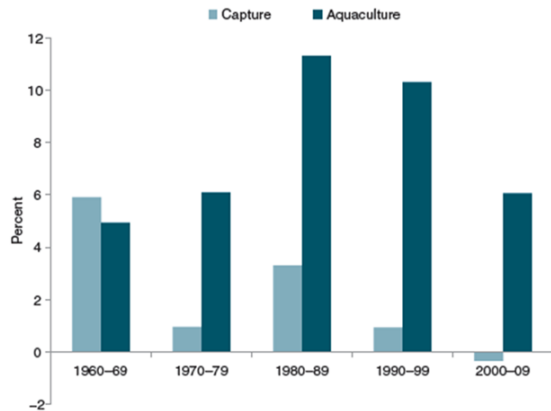
Notes: (a) 2011 estimates, (b) 2010 estimates.
 Source data from FAO (2012) and Shepherd and Jackson (2013).

Béné et al (2015)

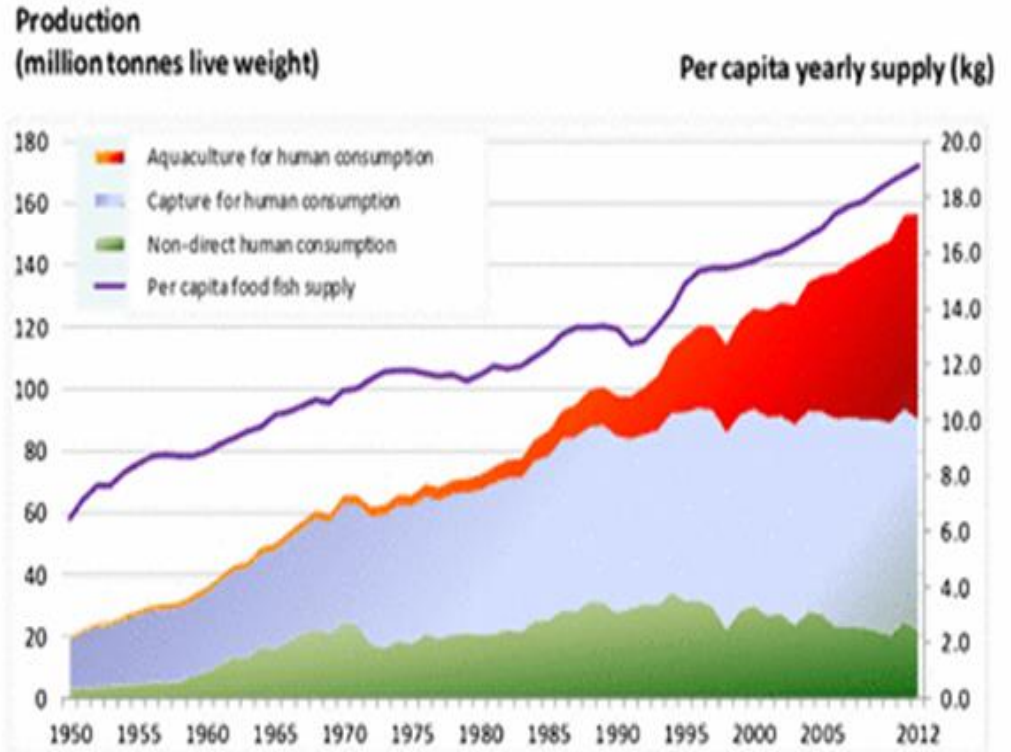
Global snapshot

Fig. 2 Relative contribution of aquaculture and capture fisheries to production and food fish supply. Source: FAO Statistics and Information Branch of the Fisheries and Aquaculture Department

FIGURE 1.3: Average Annual Growth Rates of Capture and Aquaculture Production, 1960–2009



Source: FishStat.



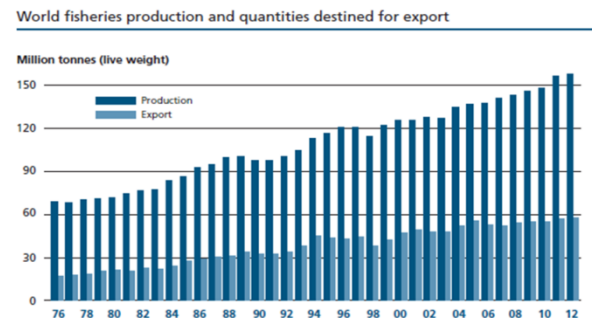
Source: FAO Statistics and Information Branch of the Fisheries and Aquaculture Department.

Béné et al (2015)

Global snapshot

Fish is among most traded food commodity globally (most traded for some countries), with 37% of total production exported. High degree of integration with over 200 countries reporting exporting fish in 2012.

Figure 16



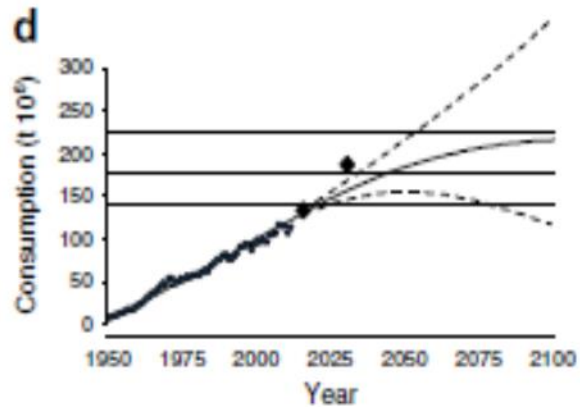
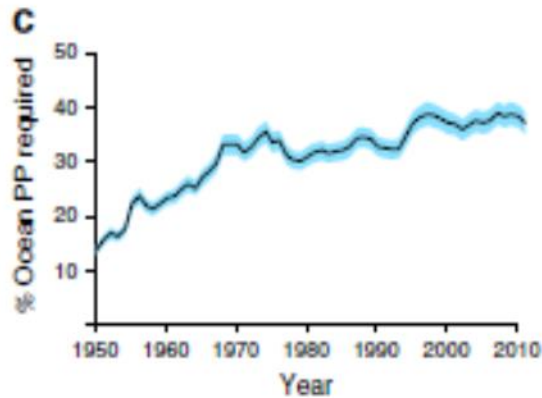
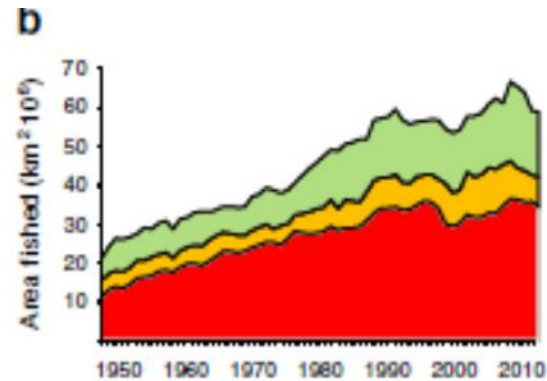
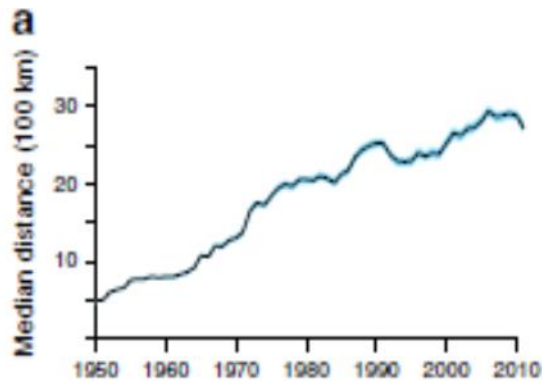
Overall pattern of developed countries dominating imports (73% value – 55% volume) and developing countries dominating exports (54% value – 60% volume)

China, Norway, Thailand, and Vietnam are world's biggest exporters

Japan, US, China and Spain are world's biggest importers

China fastest growing importer and exporter.

Global snapshot

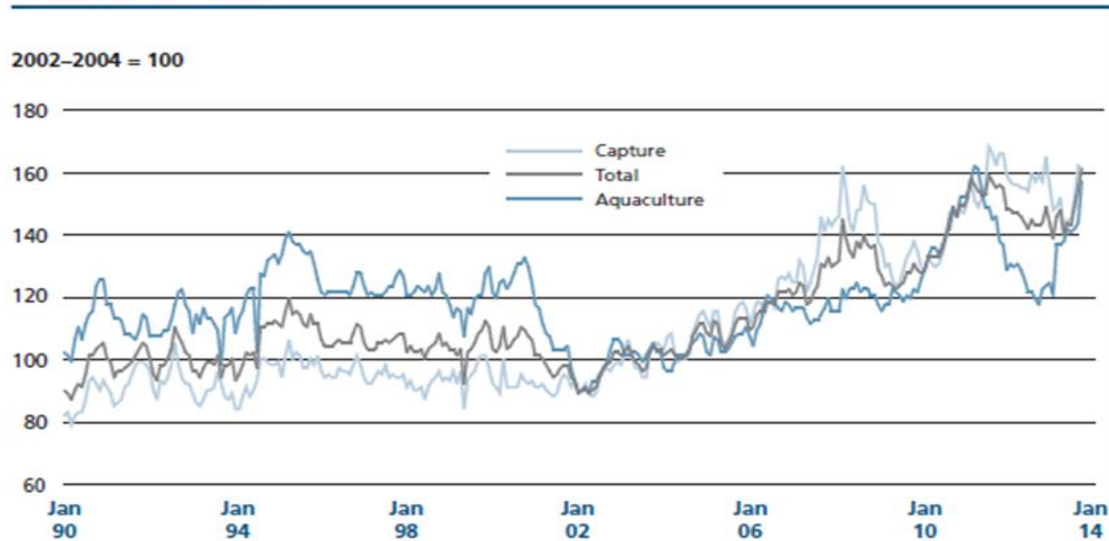


Watson et. al. 2015

Global snapshot

Figure 18

FAO Fish Price Index

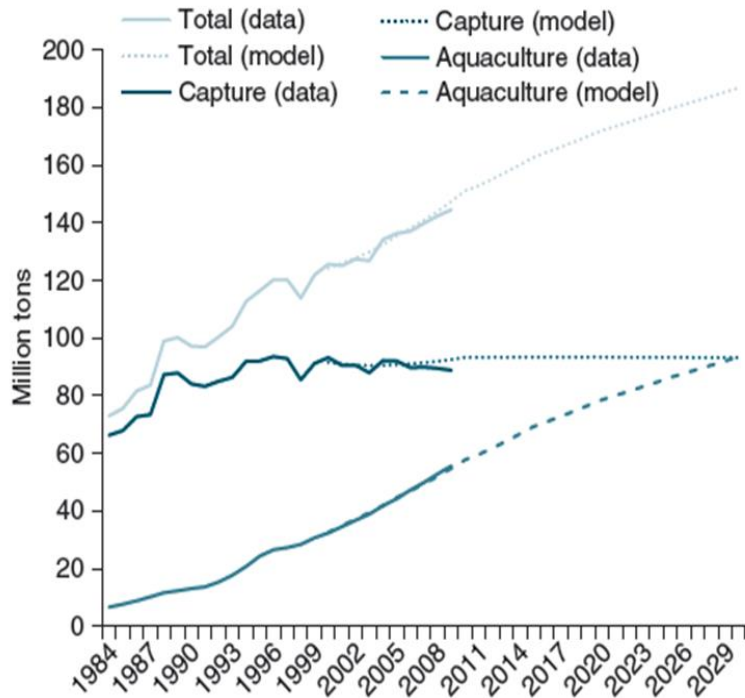


Data source: Norwegian Seafood Council.

FAO, 2014

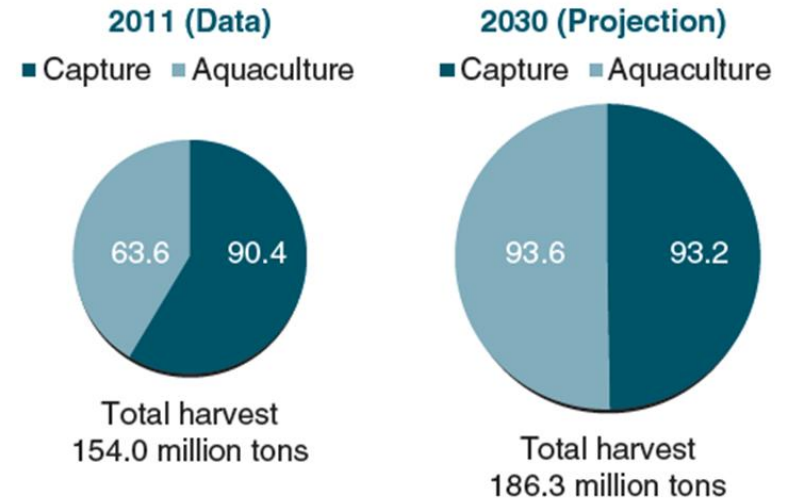
Global snapshot

FIGURE 3.1: Global Fish Production: Data and Projections, 1984–2030



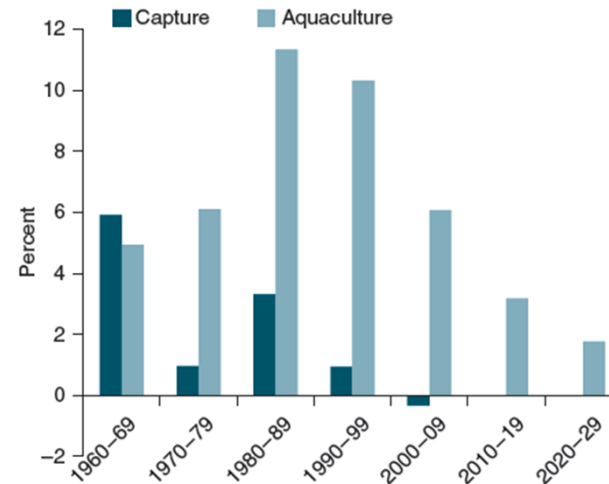
Sources: FishStat and IMPACT model projections.

FIGURE 3.2: Volume and Share of Capture and Aquaculture Production in Global Harvest



Sources: FishStat and IMPACT model projections.

FIGURE 3.3: Average Annual Growth Rates of Capture and Aquaculture Production, 1960–2029



Sources: FishStat and IMPACT model projections.

Global snapshot

“Given the very rough projections for fish demand and the more elaborate projections for fish supply just reviewed above, will fisheries and aquaculture be able to maintain their current contribution to food security in the future? The answer that emerges from the literature is that as far as food availability and demands are concerned, it is a conditional yes. All the projection models currently available seem to agree that the overall fish consumption rate could be maintained, in other words, that the fisheries and aquaculture aggregated growth will keep up with population growth rates.”

Béné et al (2015)

Australian snapshot

Australia has world's third-largest EEZ – larger marine than terrestrial domain

Low productivity (by international standards), only minor upwelling regions

Reflected in relatively low catches and a heavy (>70%) reliance on imported fish.

Average consumption per annum of about 25kg

Main export destinations: Hong Kong, Vietnam Japan, China, US

Main import sources: Thailand, New Zealand, Vietnam, China

Australian snapshot

Wild catch sector – 2012-2013

- Gross Production value of \$1.4 billion
- Gross production volume of 157 252 tonnes
- Sector accounts for 57% gross fisheries production value
- Top Species (in order of production value): Rock lobster, prawns, abalone, tuna, crab
- Jurisdictions (in order of production value): WA (\$331m), Commonwealth (\$320m), SA (\$198m), QLD (\$195m), TAS (\$176m), NSW (\$76m), VIC (\$54m), NT (\$34m)
- Australia's sixth most valuable food based primary industry.

Opportunities for growth in wild catch fisheries

1. New or underutilised species
2. Improved management of existing species
3. Increase access/resource share
4. Increase recovery rates
5. Reduced waste from production to consumption
6. Restoration and enhancement

Opportunities for growth

1. New or underutilised species

Currently <10% marine species targeted, and it is targeted species that bear the brunt over exploitation. Tend to be valuable, high trophic level species.

Some evidence that pressure at overall ecosystem level is small, suggesting that it may be the focussing of high harvest efforts on particular species/size/sex that is the cause of overfishing.

Balanced fishing: distribute moderate fishing pressure to all ecosystem components in proportion to each component's natural productivity.

Opportunities for growth

2. Improved management

*“ ... the global marine fishery could achieve its maximum economic potential by reducing aggregate fishing effort by some 44 percent relative to the fishing effort in 2012. This would eventually more than double the fishable biomass and increase the sustainable global marine harvest **by almost 13 percent** compared to the level in 2012. The recovery of fish stocks would also increase the proportion of high-value fish in the catch, raising the average unit price of fish by about 24 percent. (Sunken Billions Revisited, 2015)*

Increase sustainable catch from stocks that are classified as ‘fully exploited’ (60% of stocks globally) through better use of standard management rules such as size limits and the use of spatial management.

eg. The move to zonal management in NZ’s rock lobster industry resulted in an about 25% increase in harvest, even though classified as fully exploited.

Opportunities for growth

3. Increased access/ resource share

- Many commercial wild catch species currently 'shared' with alternative uses (e.g. recreational fishers, conservation).
 - Reallocation of rights
 - Multiple-use of conservation areas allowing for restricted fishing/catch.

Opportunities for growth

4. Increase in recovery rates

During processing generally only fillets retained and up to 66% of the fish is discarded.

- i. Better filleting practice can reduce amount discarded.
- ii. Market fish 'waste' in the form of different edible products.

Opportunities for growth

5. Reduce waste along supply chain

Recent US study (Love et al. 2015):

44% of edible US seafood lost along the supply chain

Consumption phase loss is the most significant element in this (41-56%), most of which is fresh and frozen fish.

Even greater losses occur in production phase, largely due to bycatch discarding

Opportunities for growth

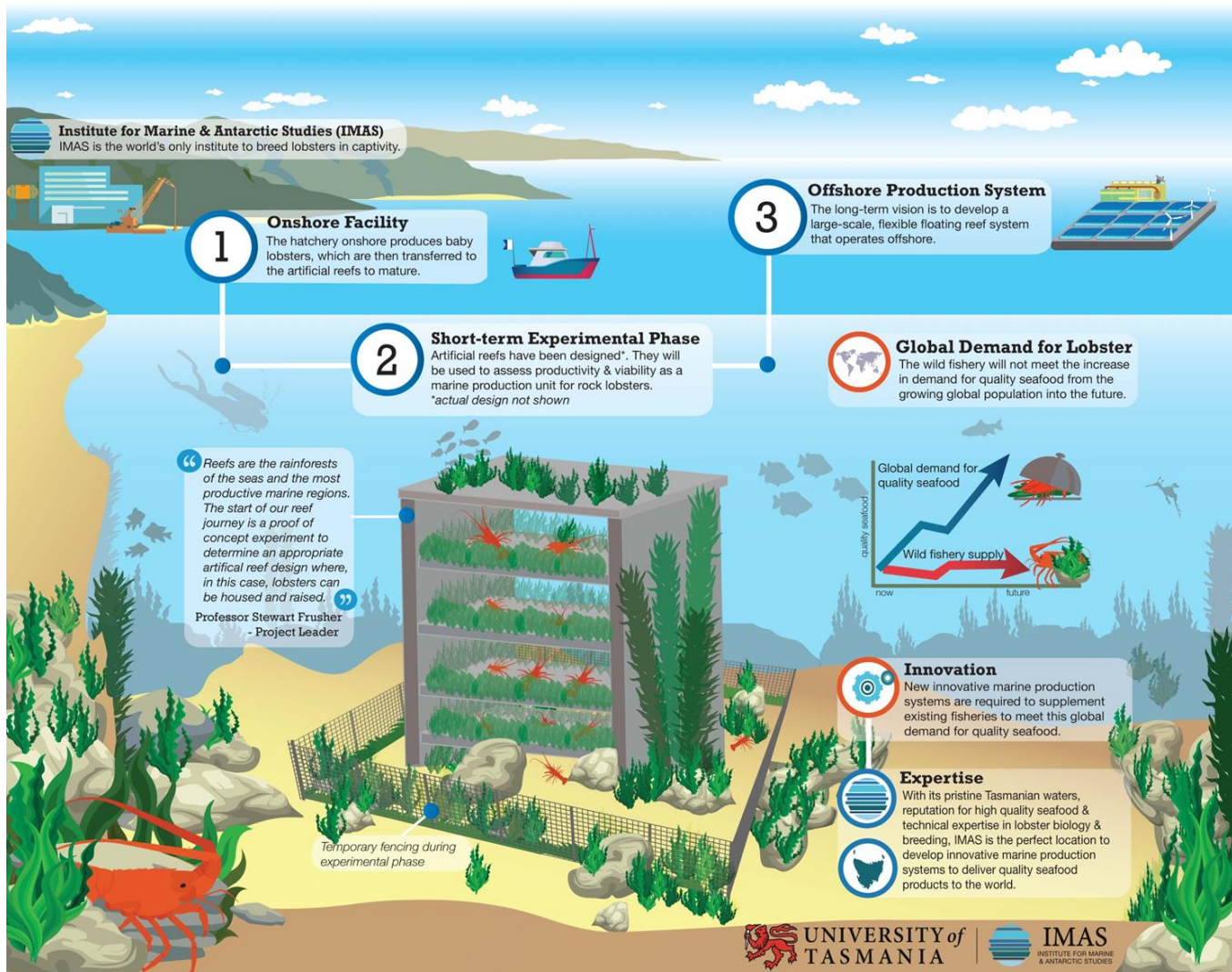
6. Restoration and enhancement

*“A \$350 million investment in estuarine **habitat restoration** would be recouped in five years through increased fisheries productivity according to a new cost-benefit analysis that identifies a national program of priority works” (Creighton et al (2012))*

Translocation of juvenile rock lobster from deep to shallow waters in Tasmania shown to increase sustainable catch levels and marketability (price). (Gardner et al 2015)

Opportunities for growth

Restoration and enhancement



Challenges

1. The Usual suspects

2. Elephants in the room

i. Navigating the Blue Economy



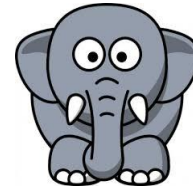
ii. Public perceptions/social acceptability



The 'usual suspects'

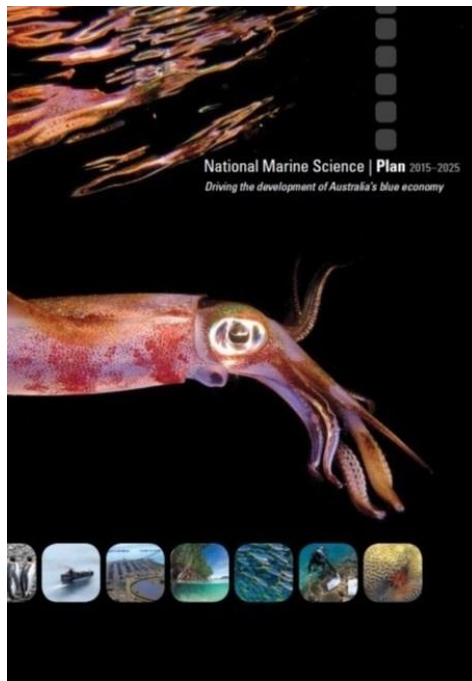
Fish prices	Leadership	Regulatory framework
Input prices	Property rights	Policy framework
Exchange rates	Quota markets	Red tape
Technology	Logistics	Green tape
Access to capital	Management framework	The private business case
Infrastructure	Subsidies	The public 'business' case
Skills/knowledge	Transaction costs	Societal preferences
Entrepreneurship	Trade restrictions	Consumer tastes/preferences

Navigating the Blue Economy



“By 2025, Australia’s marine industries will contribute about \$100b per annum to our economy, more than doubling its contribution of \$47.2b in 2012.”

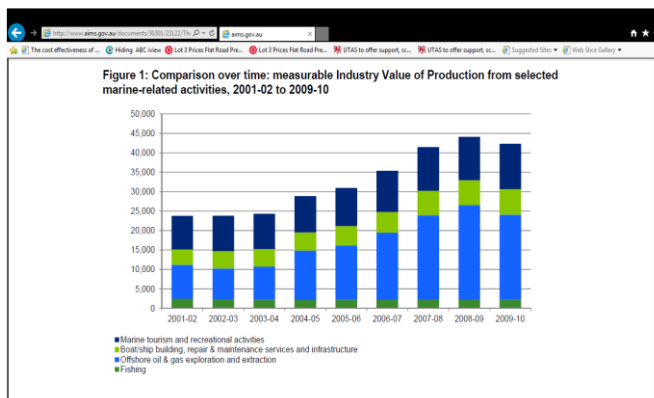
Represents growth that is 3 times the projected growth rate of GDP.



Navigating the Blue Economy



- Fisheries is a relatively small player in an already crowded space ... that is about to get a whole lot more crowded, contestable and competitive.
- For managers and economists: more stakeholders (values), unknown consequences, multiple interactions and cumulative impacts.





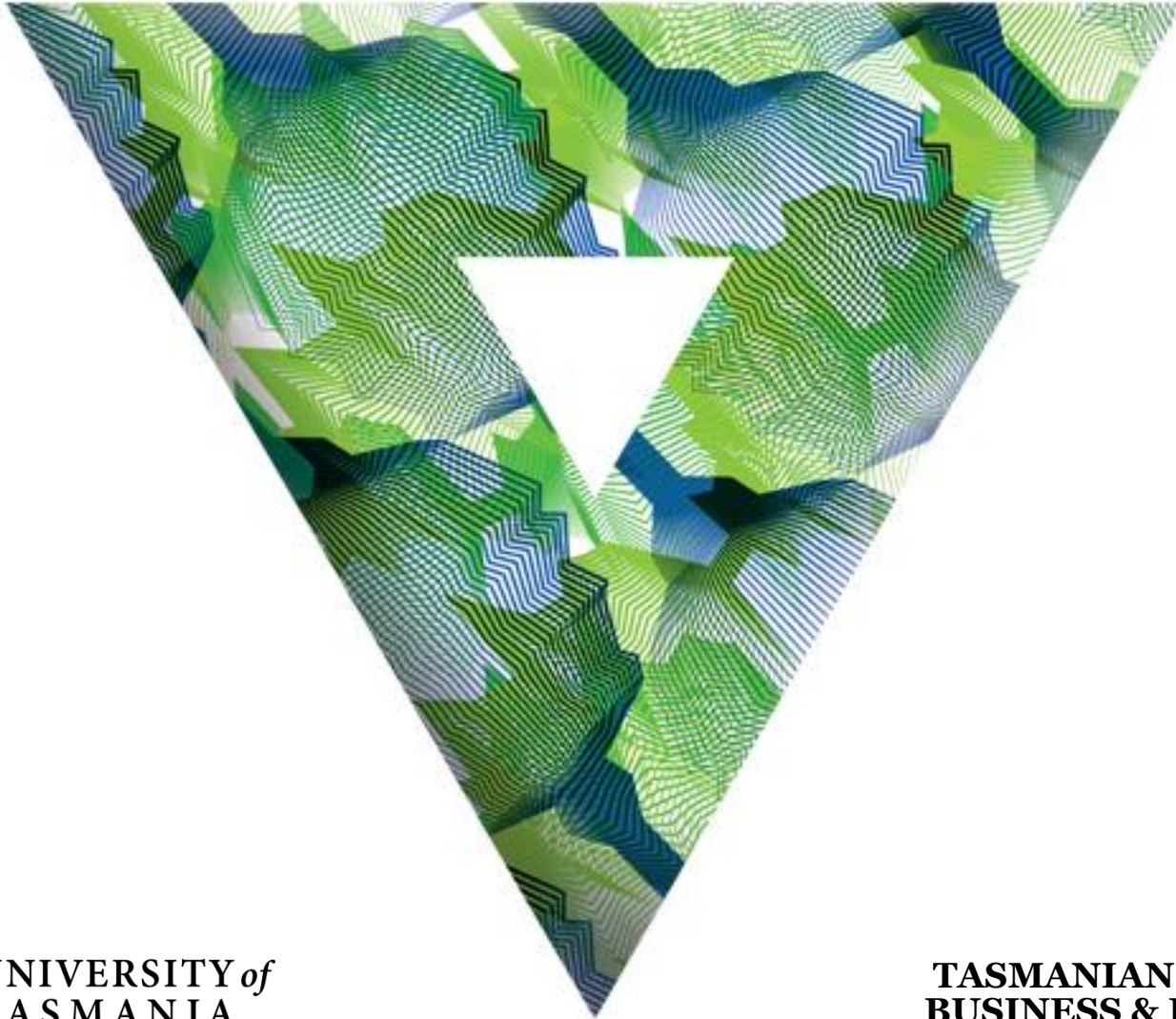
Public perceptions / social acceptability

Of 1021 respondents shows that only 30% believe that the commercial wild catch fishing sector is sustainable (FRDC 2013).

Why the gap between science and the public perception?

1. Haven't updated historical perceptions (orange roughy)
2. Transferring international situation (Worm (2007); Thailand slave-labour)
3. Information filtered
4. Perceptions formed on different ethical basis/ values frame (not on objective interpretation of data/information)

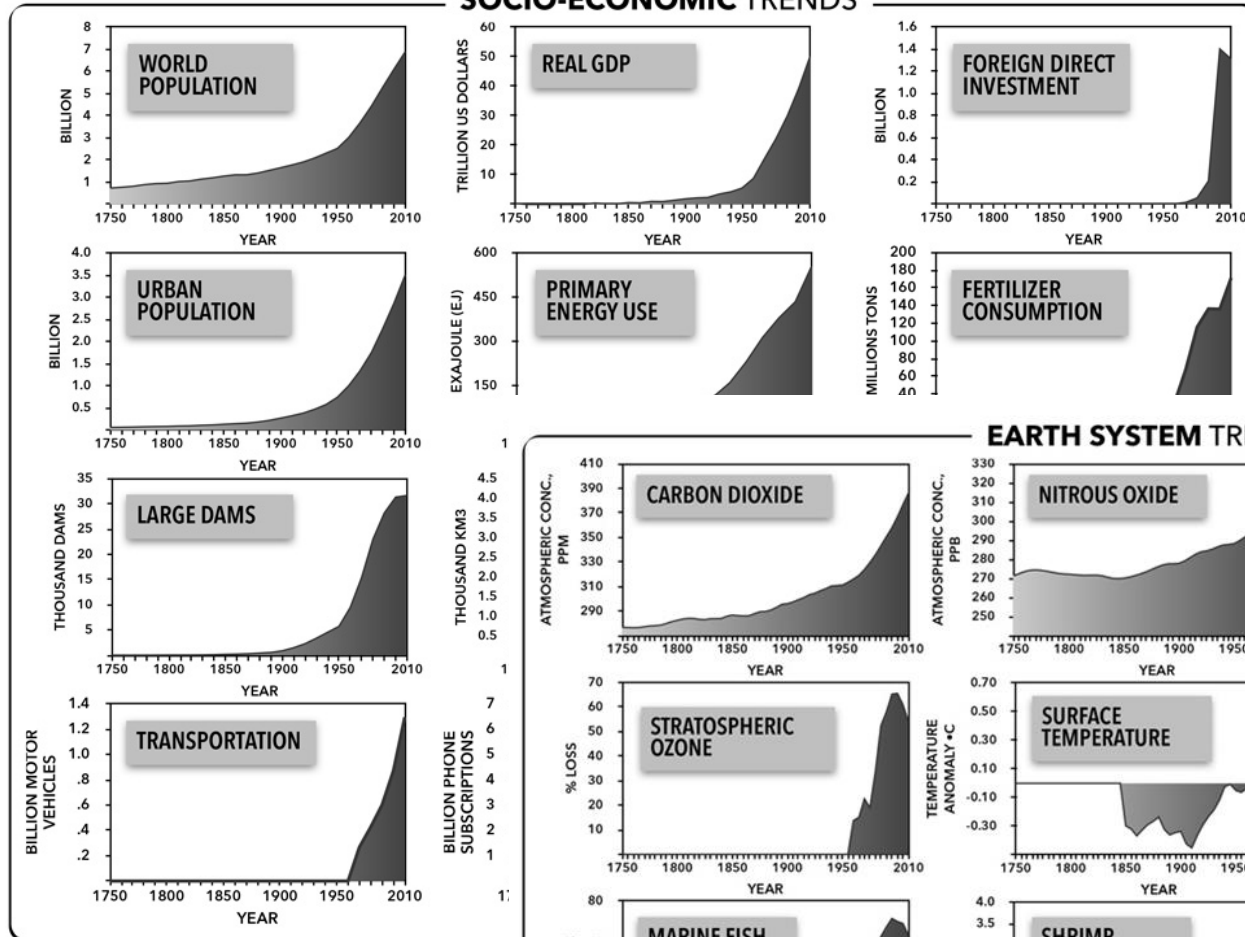
What to do about it?



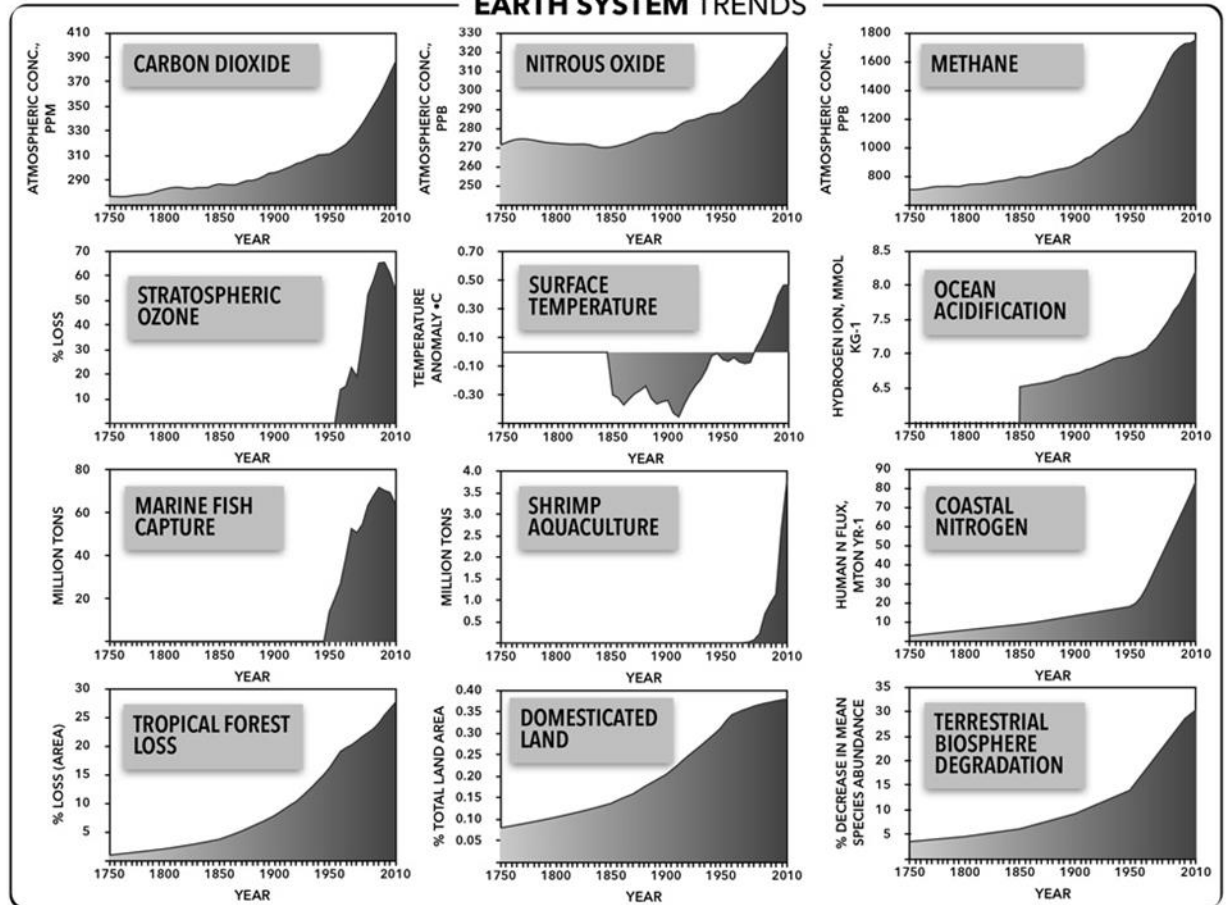
Fisheries management in the Anthropocene



SOCIO-ECONOMIC TRENDS



EARTH SYSTEM TRENDS



“Socio-Economic Trends” and “Earth System Trends” charts (above) created by R. Jamil Jc based on data in Will Steffen, Wendy Broadg Lisa Deutsch, Owen Gaffney, and Cornelia Lu “The Trajectory of the Anthropocene: The Gre Acceleration,” *Anthropocene Review* 2, no. 1 (2015): 81–98.



allocation

efficiency

distribution

