Turning the Tide: Impacts of Environmental Change on Aquatic Food Security and Nutrition

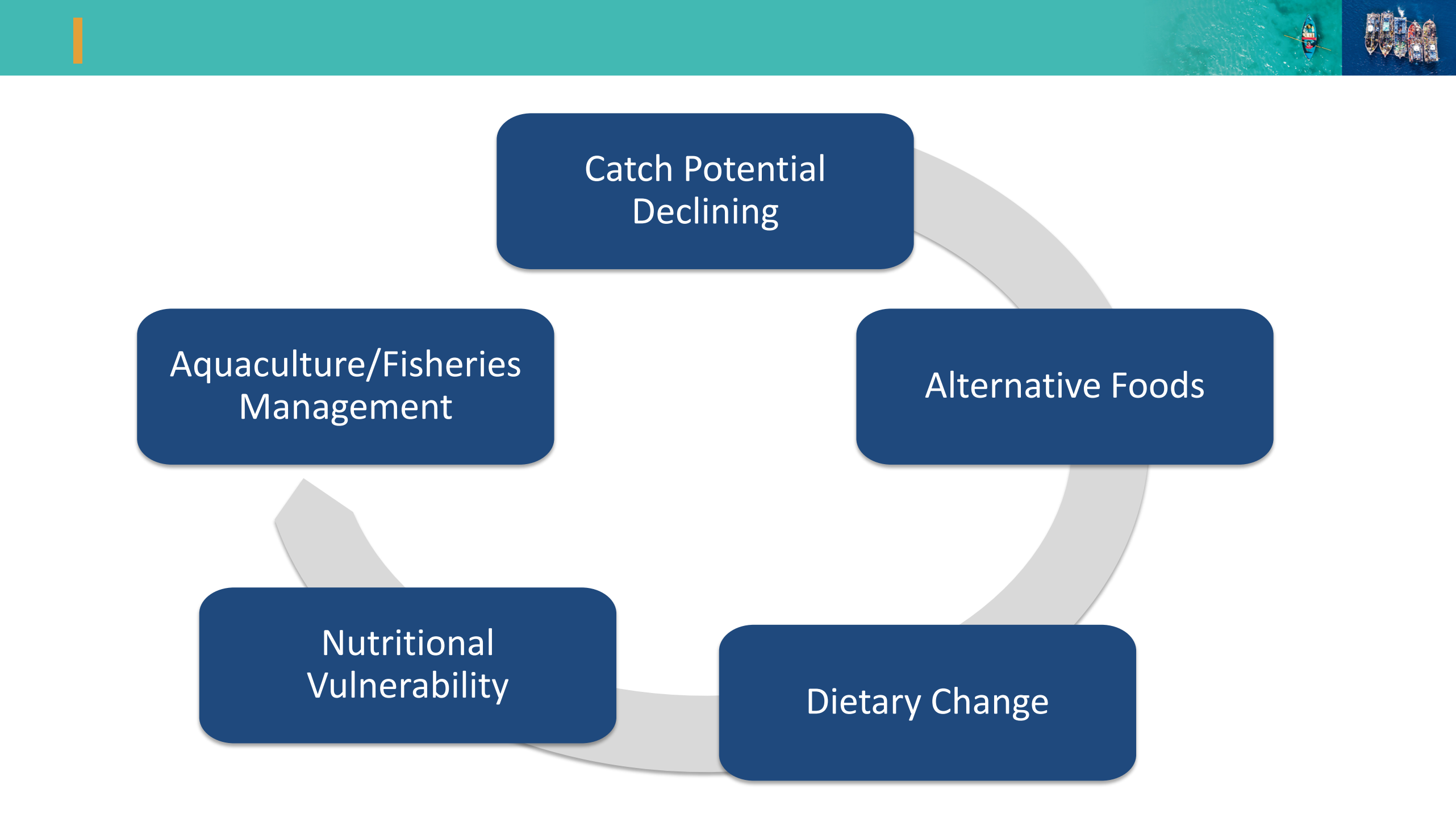
Prof. Christopher D. Golden
Harvard TH Chan School of Public Health

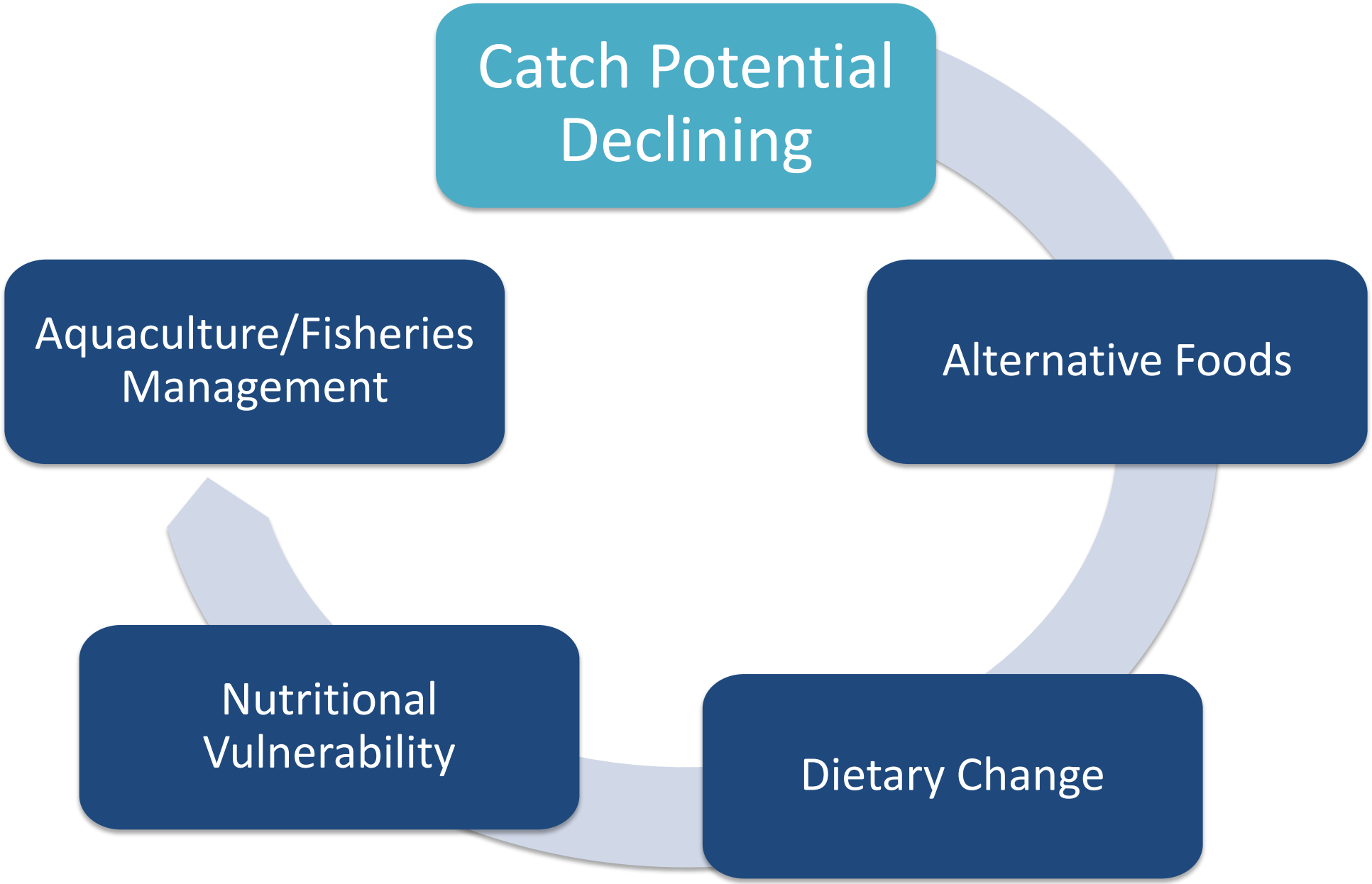
Rome, 18-21 November 2019

Session 3
Panel 3.2

International Symposium on Fisheries Sustainability:
Strengthening the Policy-Science Nexus

ENVIRONMENTAL CHANGE AS PUBLIC HEALTH RISK


Catch Potential Declining
Alternative Foods
Dietary Change
Nutritional Vulnerability
Aquaculture/Fisheries Management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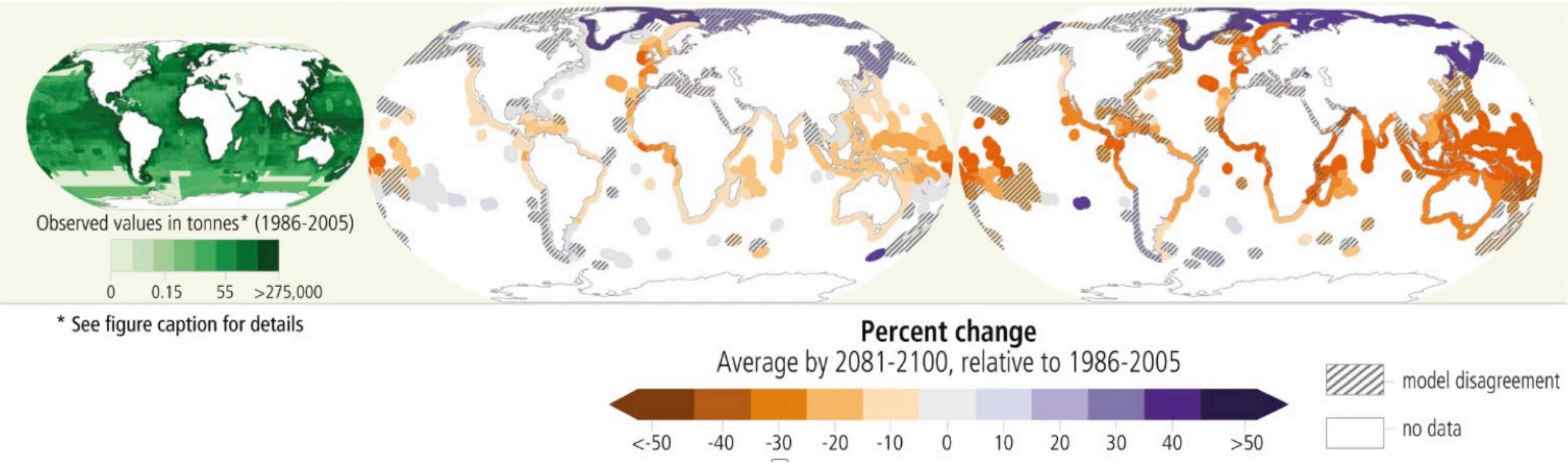
PROJECTED CHANGES IN MAXIMUM FISHERIES CATCH POTENTIAL

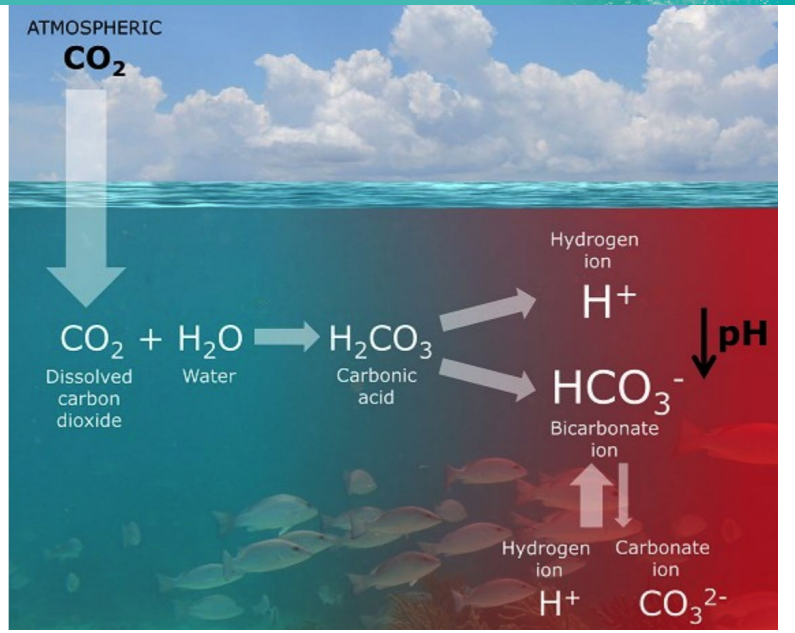


IPCC, 2019: IPCC Special Report on the Ocean and Cryosphere in a Changing Climate. Pörtner, Roberts, Masson-Delmotte, Zhai, Tignor, Poloczanska, Mintenbeck, Nicolai, Okem, Petzold, Rama, and Weyer (eds.). In press.

OTHER ENVIRONMENTAL THREATS TO FISHERY PRODUCTION AND CATCH

A global analysis of coral bleaching over the past two decades

S. Sully [1], D.E. Burkepile [2,3], M.K. Donovan [3], G. Hodgson [4] & R. van Woesik [1]



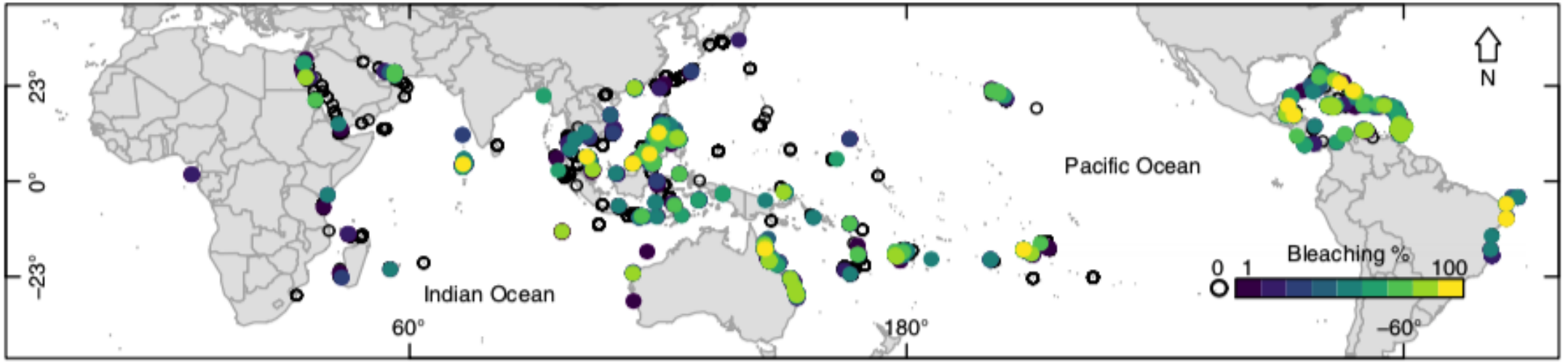
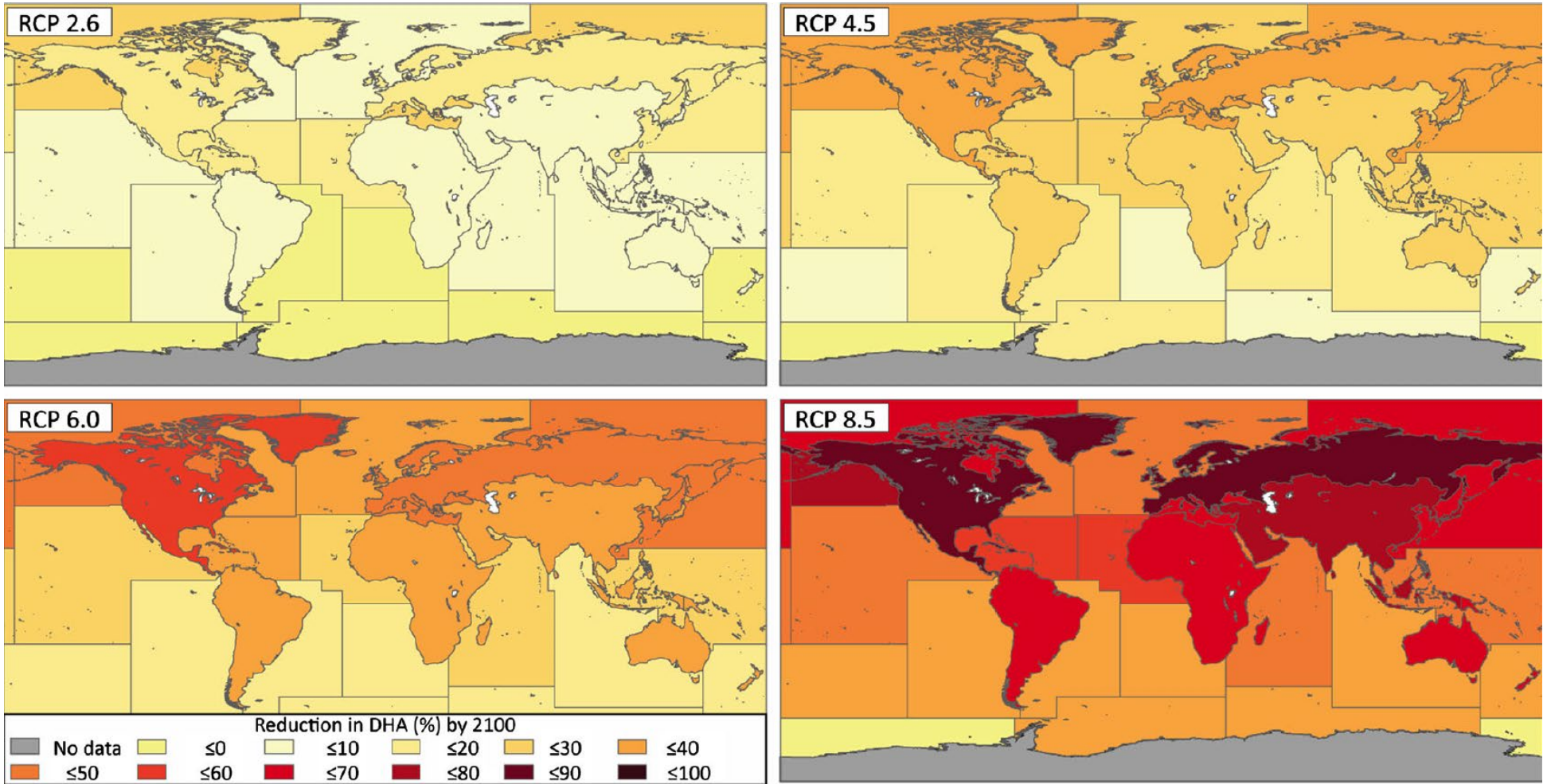
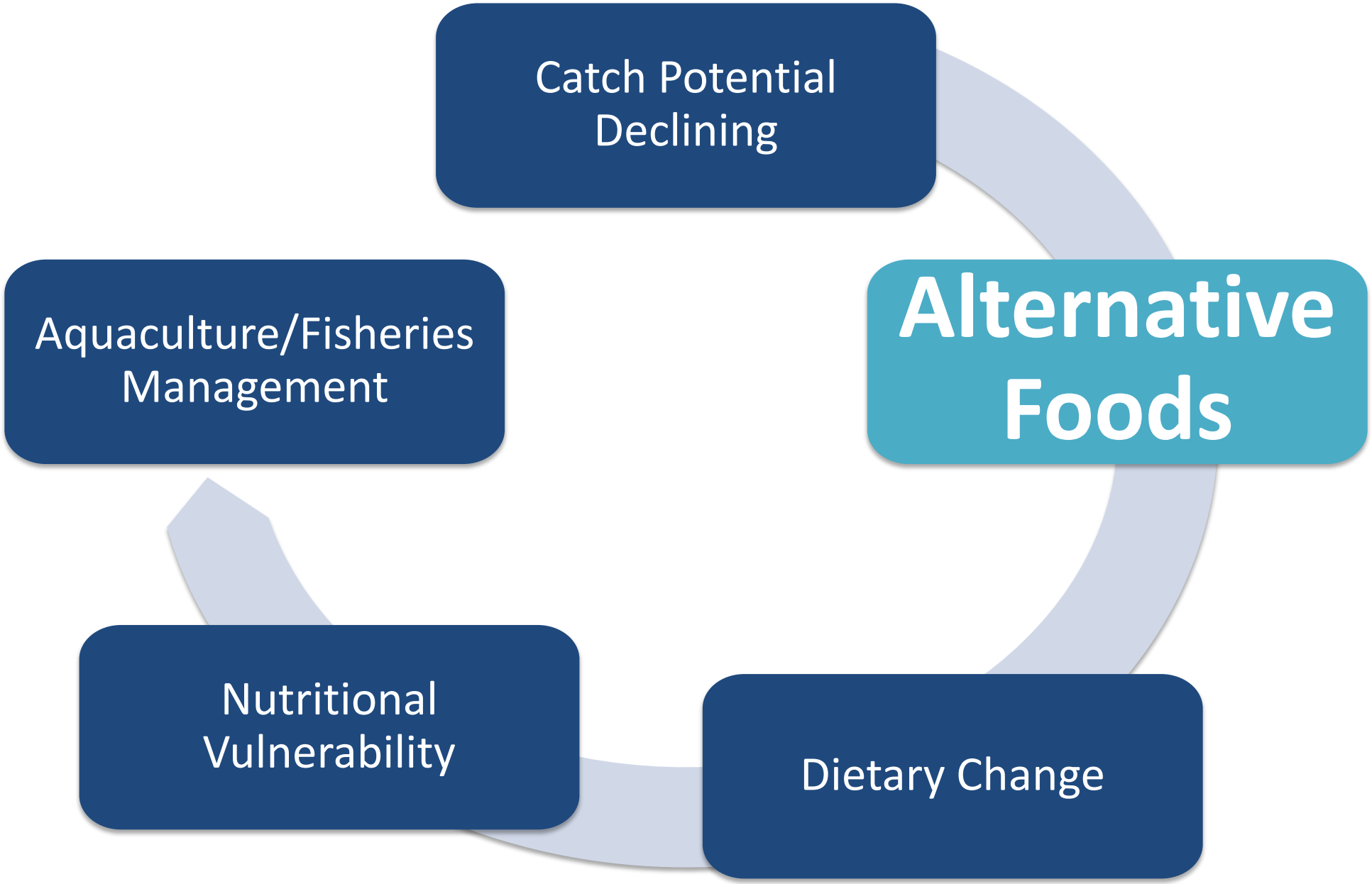


Fig. 1 Coral bleaching distribution. Prevalence of coral bleaching presented as a percentage of the coral assemblage that bleached at survey, measured at 3351 sites in 81 countries, from 1998 to 2017. White circles indicate no bleaching. Colored circles indicate 1% bleaching (blue) through 100% bleaching (yellow)

Projected declines in global DHA availability for human consumption as a result of global warming

Stefanie M. Colombo, Timothy F. M. Rodgers, Miriam L. Diamond, Richard P. Bazinet, Michael T. Arts

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WHY IS FISH NUTRITIONALLY IMPORTANT?

KEY NUTRIENTS IN SEAFOOD:

Long chain omega-3 fats
Mainly found in fish and seafood, these fatty acids are essential for optimal brain development.

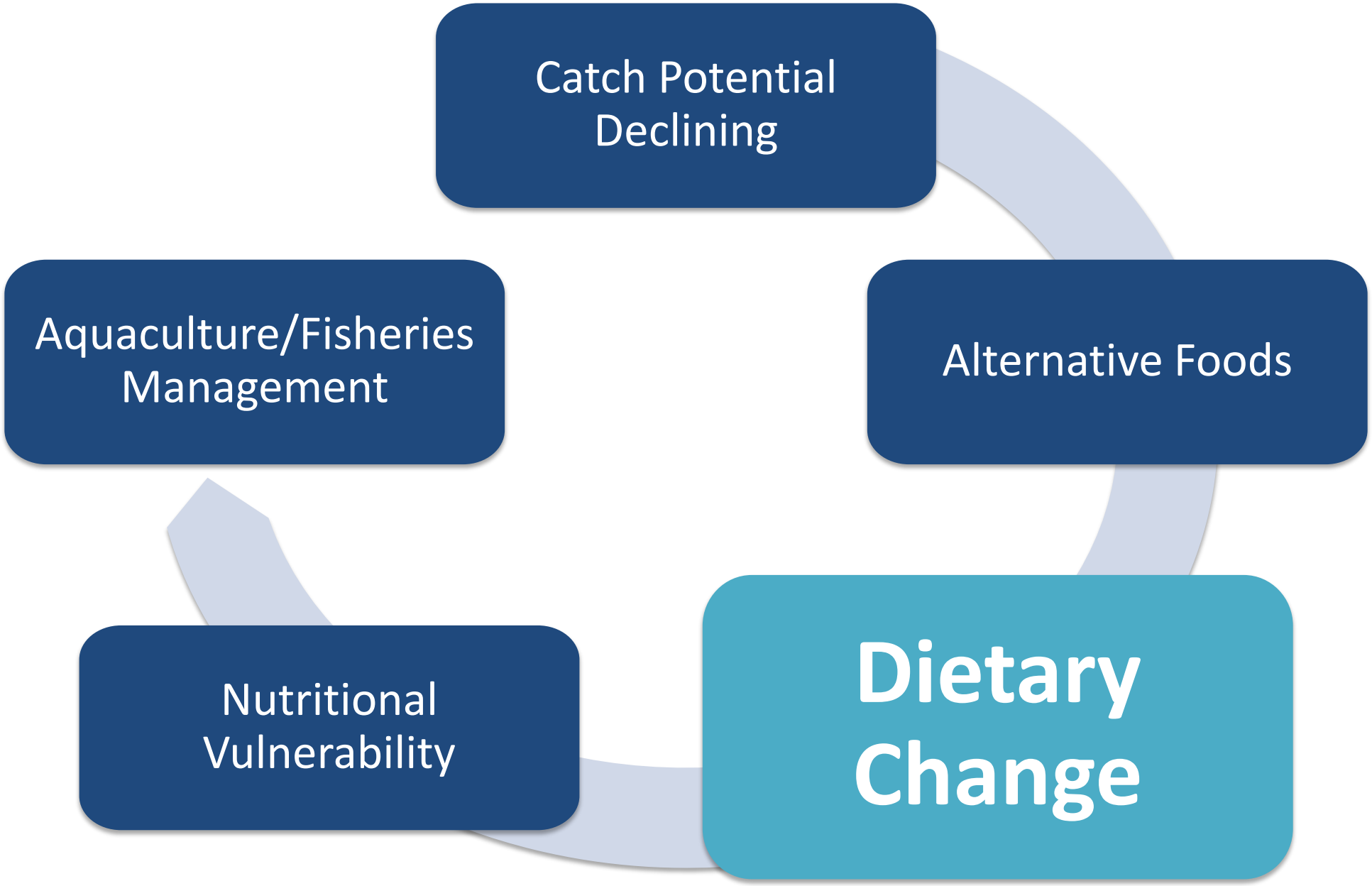
Iodine
Seafood is in practice the only natural source of this crucial nutrient. Iodine serves several purposes like aiding thyroid function. It is also essential for neurodevelopment.

Vitamin D
Another nutrient crucial for mental development, this vitamin also regulates the immune system function and is essential for bone health.

Iron
During pregnancy, iron intake is crucial so that the mother can produce additional blood for herself and the baby.

Calcium, zinc, other minerals
Diets without dairy products often lack calcium, and zinc deficiency slows a child's development.

Image credit: FAO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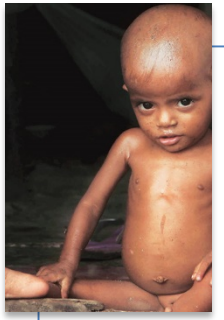
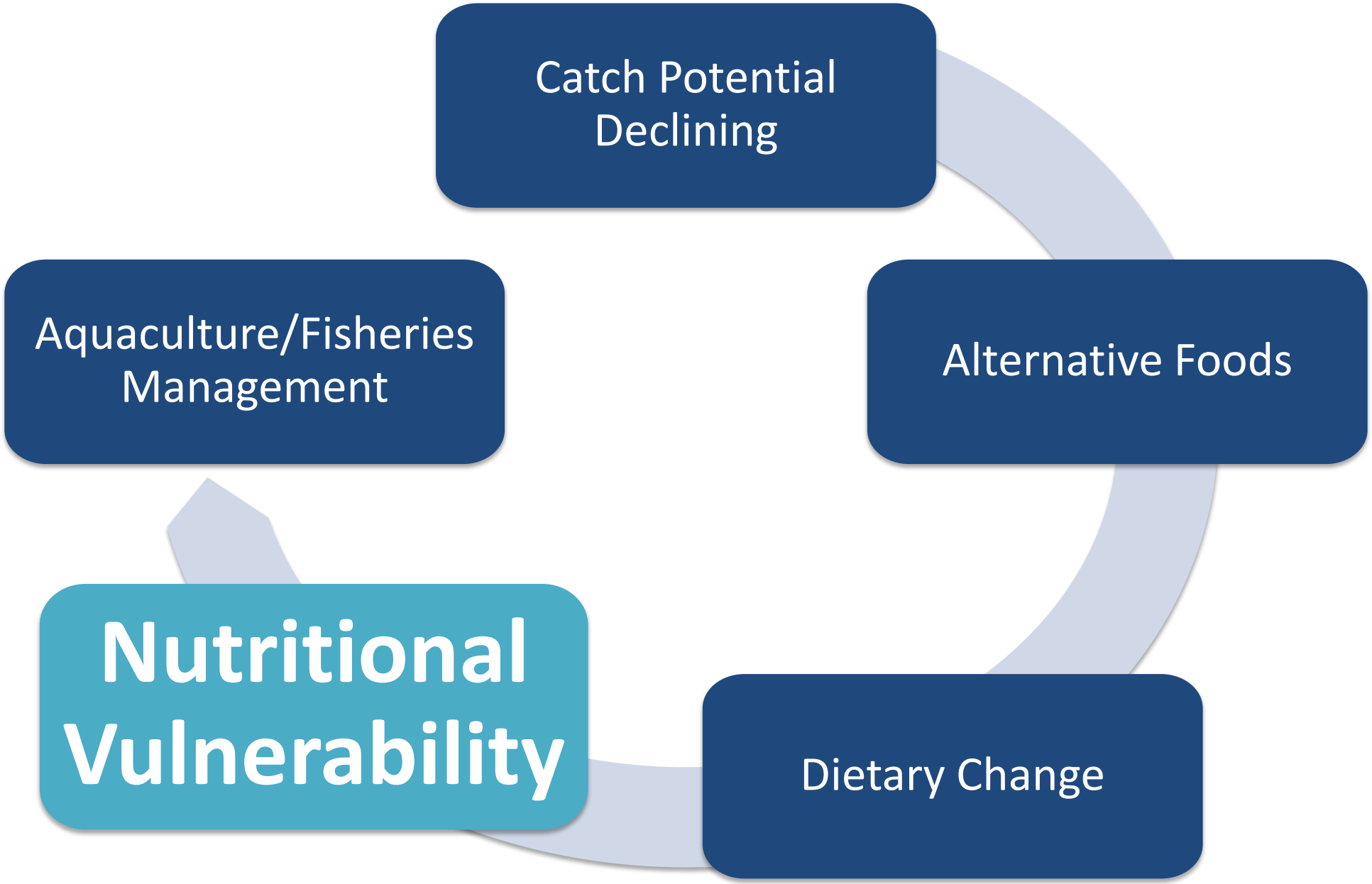
THREE TYPOLOGIES OF NUTRITIONAL IMPACTS

Unaffected wealthy nations



Increasing undernutrition

Acceleration of nutrition transition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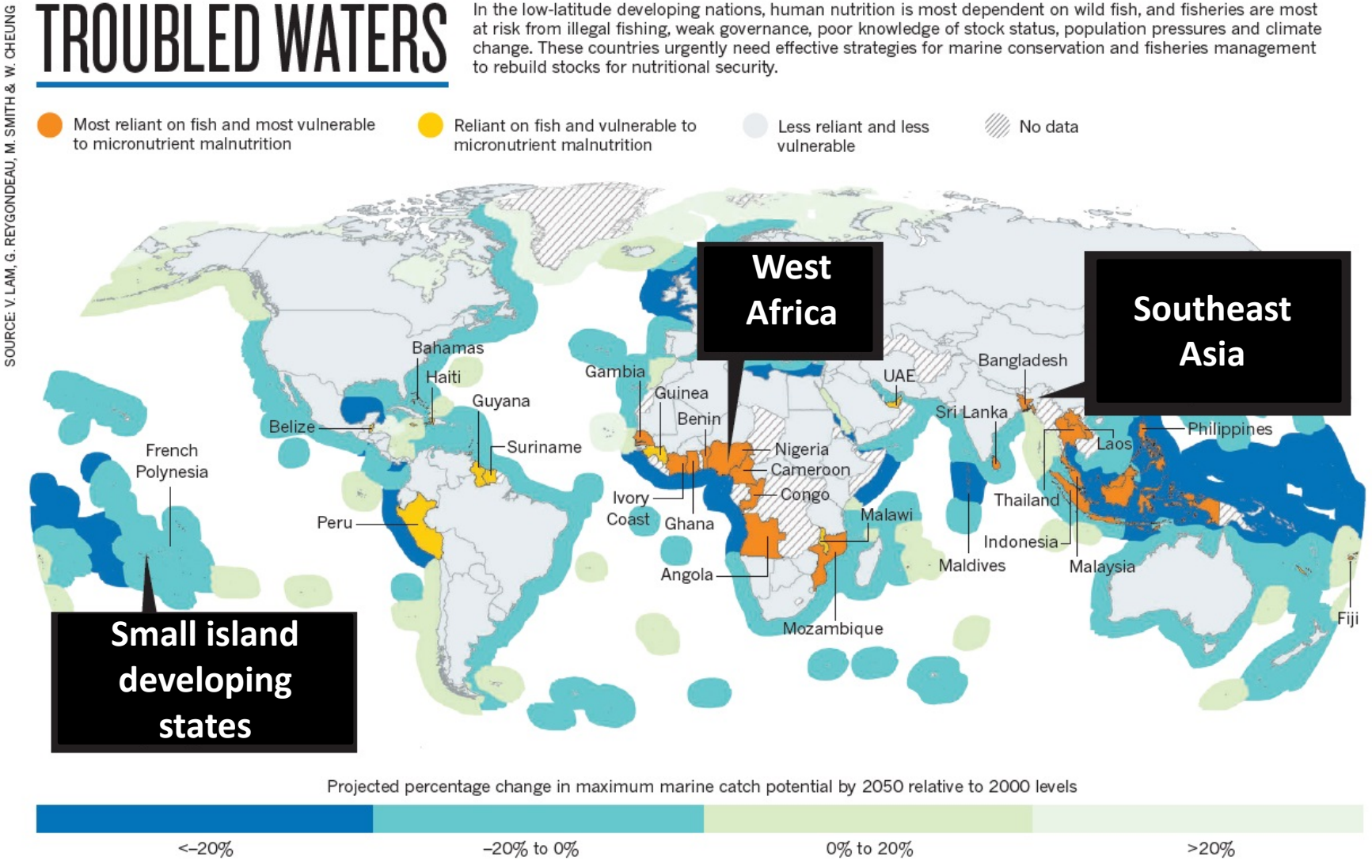
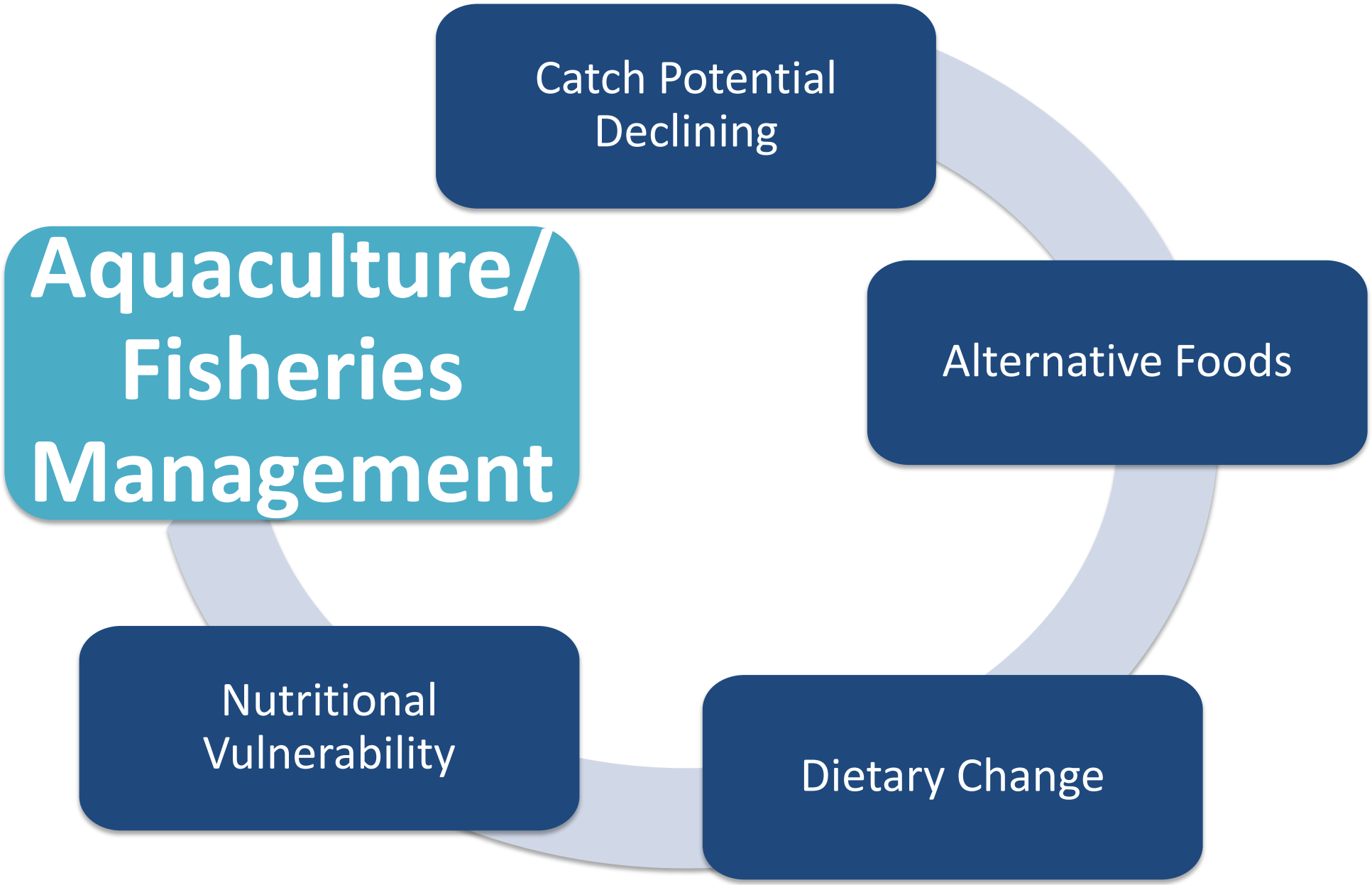
HOTSPOTS OF NUTRITIONAL VULNERABILITY

Nutrition: Fall in fish catch threatens human health

Christopher D. Golden, Edward H. Allison, William W. L. Cheung, Madan M. Dey, Benjamin S. Halpern, Douglas J. McCauley, Matthew Smith, Bapu Vaitla, Dirk Zeller & Samuel S. Myers

nature International weekly journal of science

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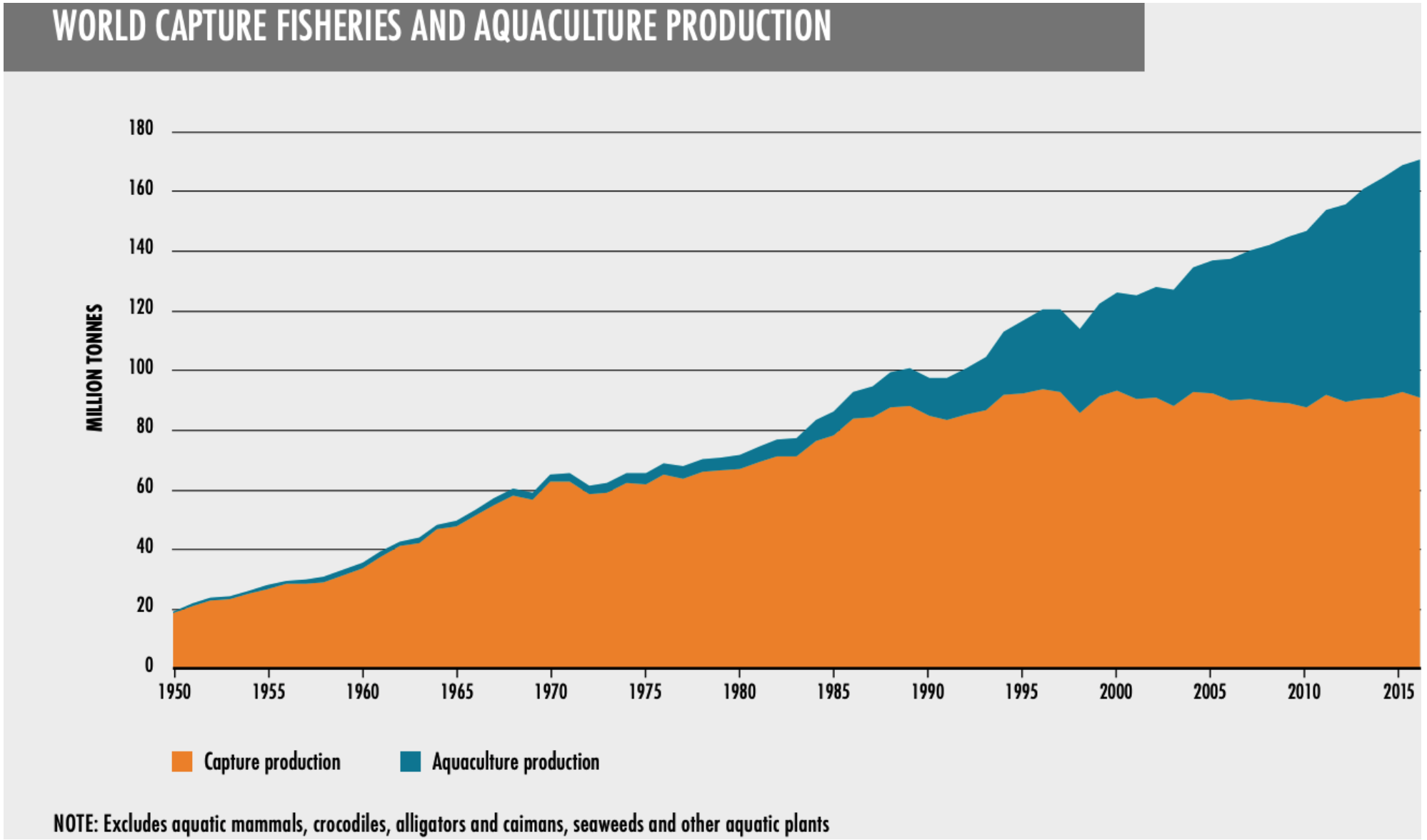
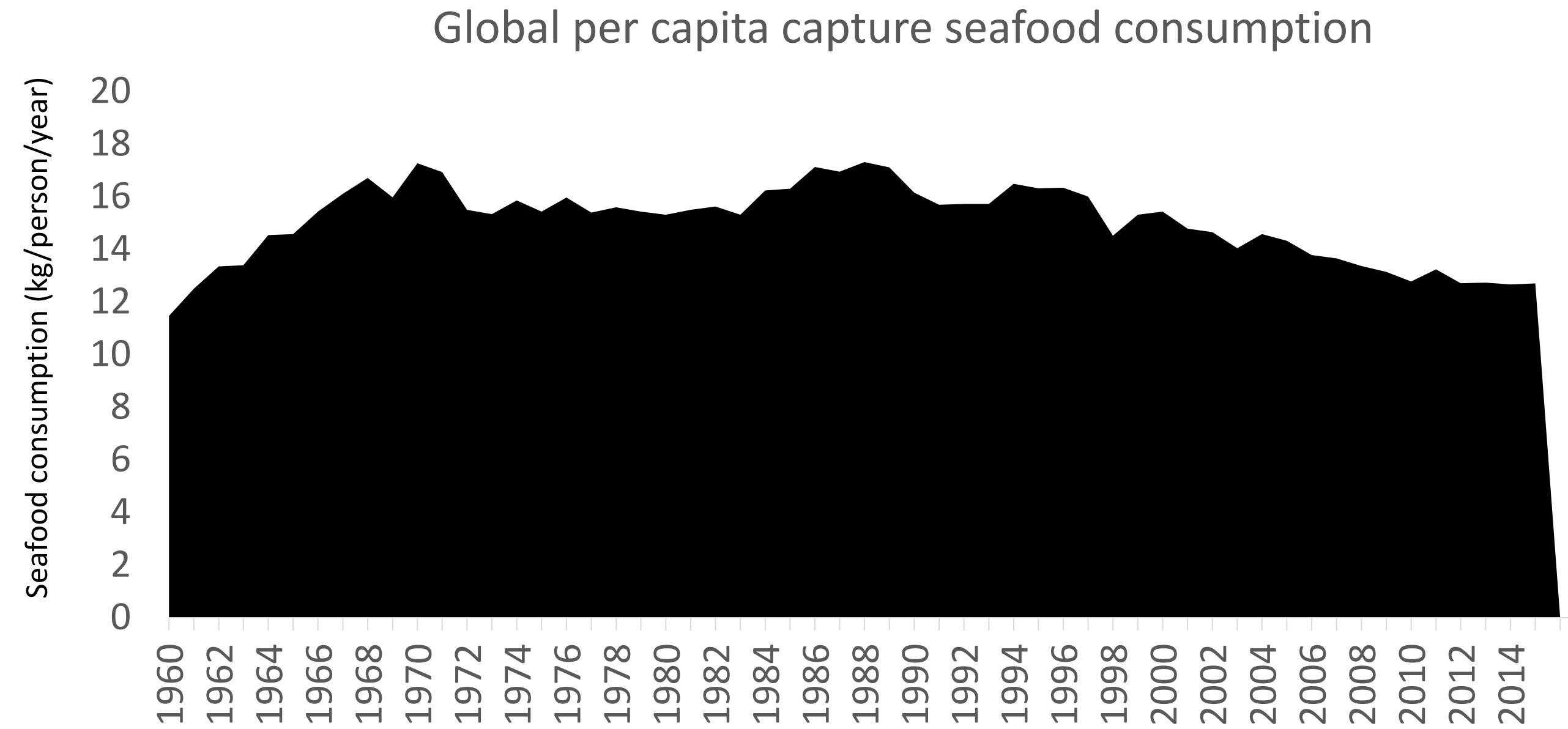
MARINE CONSERVATION AND MANAGEMENT FOR NUTRITION



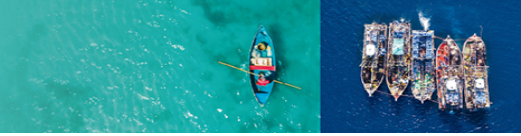
SOFIA 2018

TRENDS IN GLOBAL SEAFOOD CONSUMPTION

WITHOUT AQUACULTURE, CONSUMPTION IS DECLINING



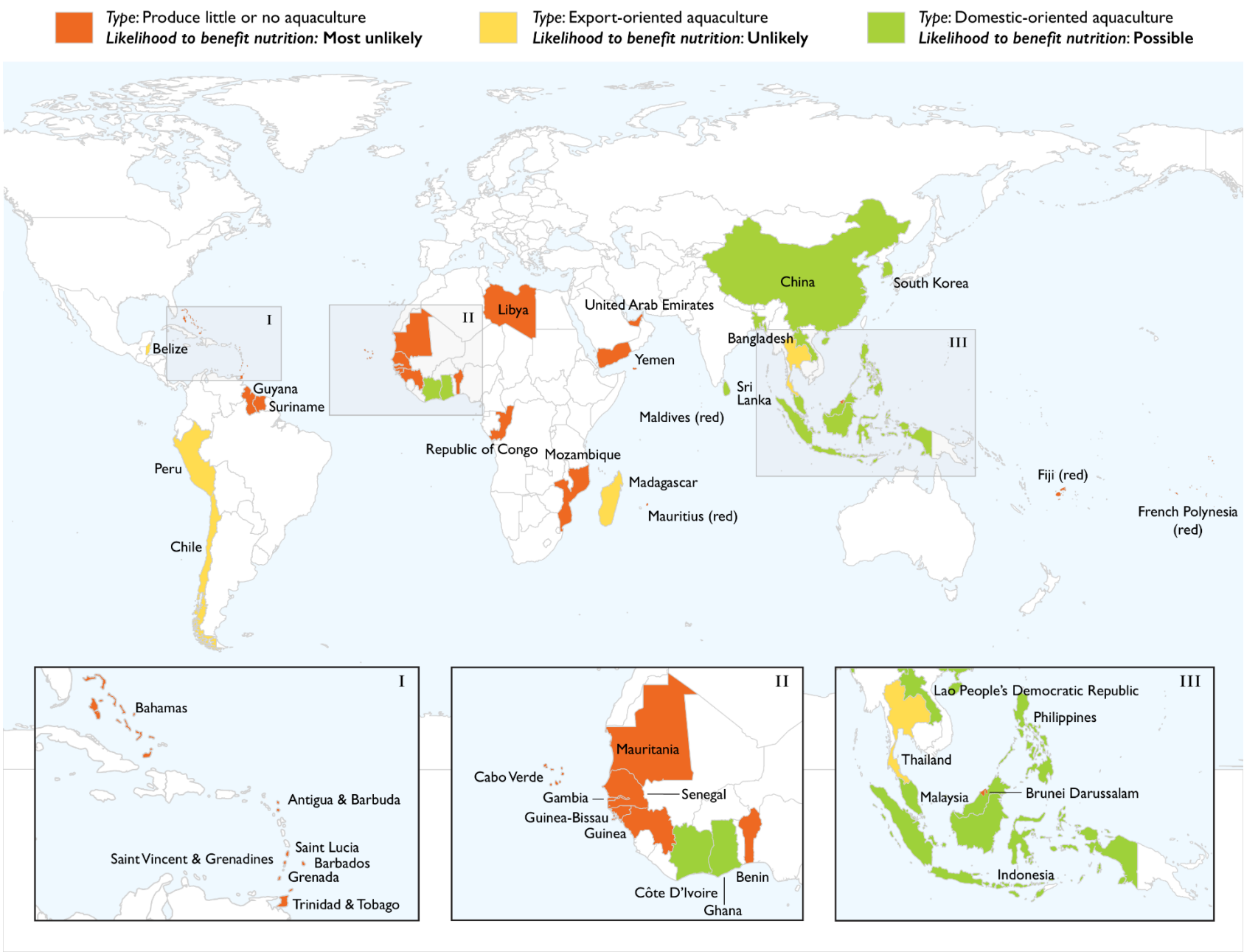
NUTRITION-SENSITIVE AQUACULTURE IS NEEDED

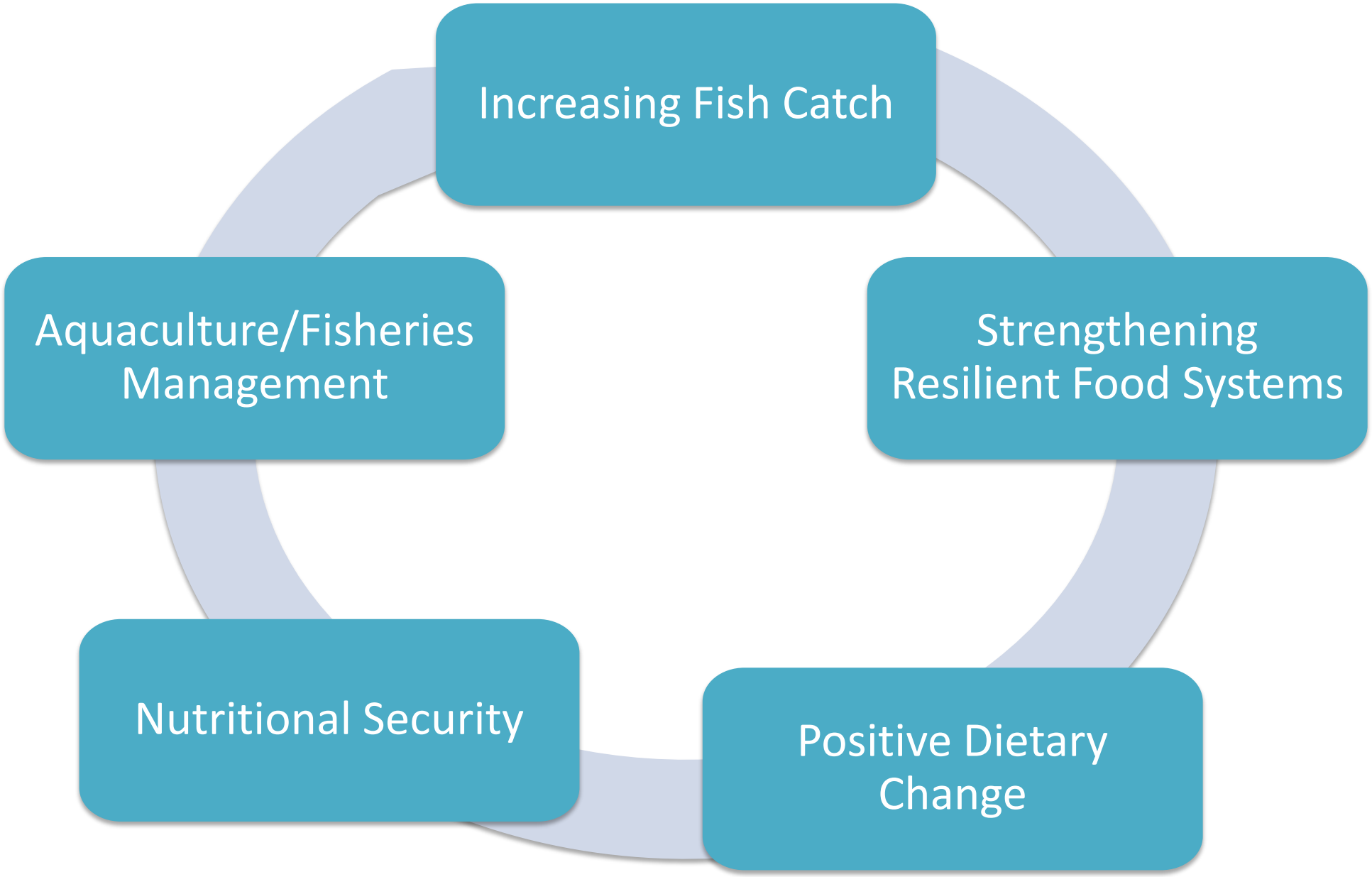


frontiers in Marine Science

Does Aquaculture Support the Needs of Nutritionally Vulnerable Nations?

Christopher D. Golden[1,2], Katherine L. Seto[3], Madan M. Dey[4], Oai L. Chen[5], Jessica A. Gephart[6], Samuel S. Myers[1,2], Matthew Smith[1], Bapu Vaitla[1] and Edward H. Allison[7]*

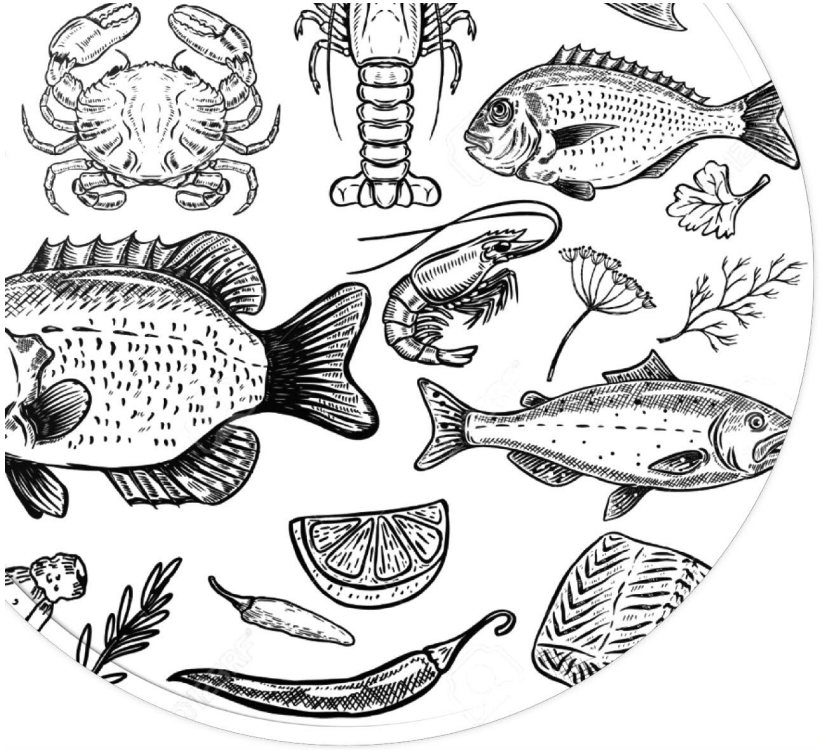



Increasing Fish Catch
Strengthening Resilient Food Systems
Positive Dietary Change
Nutritional Security
Aquaculture/Fisheries Management

EAT-LANCET COMMISSION AND A BLUE FOODS ASSESSMENT

Food in the Anthropocene: the EAT–*Lancet* Commission on healthy diets from sustainable food systems

Walter Willett, Johan Rockström, Brent Loken, Marco Springmann, Tim Lang, Sonja Vermeulen, Tara Garnett, David Tilman, Fabrice DeClerck, Amanda Wood, Malin Jonell, Michael Clark, Line J Gordon, Jessica Fanzo, Corinna Hawkes, Rami Zurayk, Juan A Rivera, Wim De Vries, Lindiwe Majele Sibanda, Ashkan Afshin, Abhishek Chaudhary, Mario Herrero, Rina Agustina, Francesco Branca, Anna Lartey, Shenggen Fan, Beatrice Crona, Elizabeth Fox, Victoria Bignet, Max Troell, Therese Lindahl, Sudhvir Singh, Sarah E Cornell, K Srinath Reddy, Sunita Narain, Sania Nishtar, Christopher J L Murray



The Blue Food Assessment

- Putting aquatic production at the heart of global food systems

Stockholm Resilience Centre
Sustainability Science for Biosphere Stewardship

Stockholm University

Stanford

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- Jessica Gephart
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- Jacob Eurich
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- Bapu Vaitla
- Eddie Allison
- Walter Willett
- Sam Myers

HARVARD T.H. CHAN
SCHOOL OF PUBLIC HEALTH

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Food and Agriculture Organization of the United Nations

SUSTAINABLE DEVELOPMENT GOALS

Partnering with FAO to make fisheries sustainable

Working for #ZeroHunger