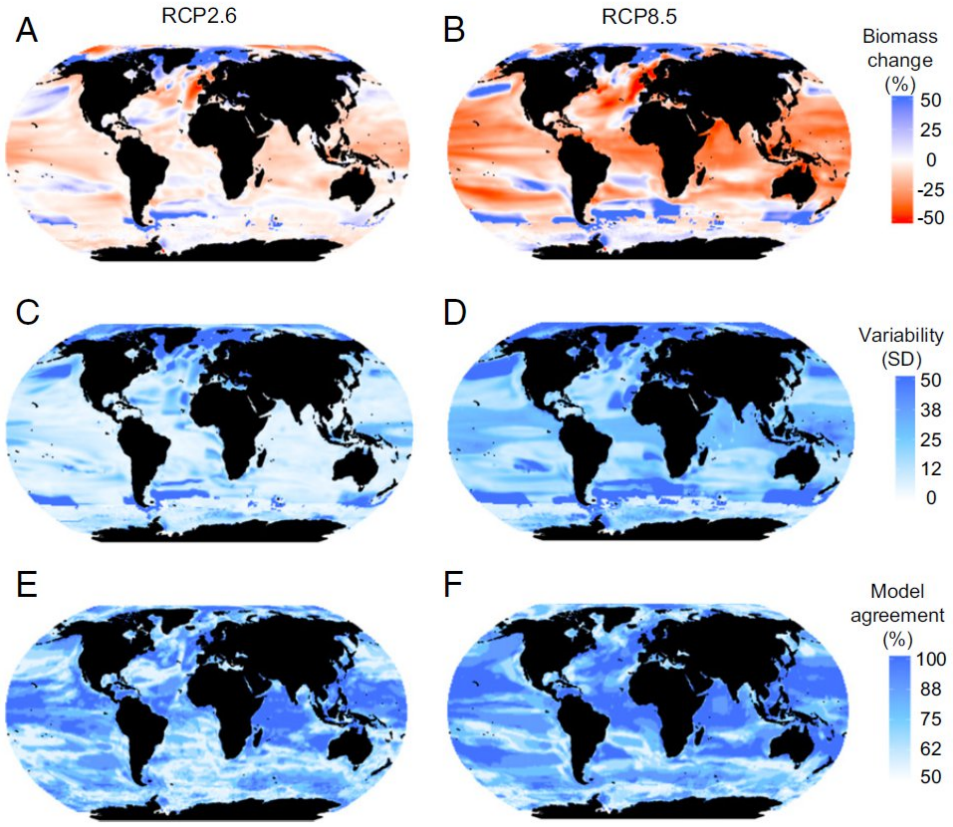
FishMIP brief update

For ISI-MIP Virtual Workshop

PNAS

Global ensemble projections reveal trophic amplification of ocean biomass declines with climate change

Heike K. Lotze[a,1], Derek P. Tittensor[a,b], Andrea Bryndum-Buchholz[a], Tyler D. Eddy[a,c], William W. L. Cheung[c], Eric D. Galbraith[d,e], Manuel Barange[f], Nicolas Barrier[g], Daniele Bianchi[h], Julia L. Blanchard[i,j], Laurent Bopp[k], Matthias Büchner[l], Catherine M. Bulman[m], David A. Carozza[n], Villy Christensen[o], Marta Coll[g,p], John P. Dunne[q], Elizabeth A. Fulton[j,m], Simon Jennings[r,s,t], Miranda C. Jones[c], Steve Mackinson[u], Olivier Maury[g,v], Susa Niiranen[w], Ricardo Oliveros-Ramos[x], Tilla Roy[i,y], José A. Fernandes[z,aa], Jacob Schewe[l], Yunne-Jai Shin[g,bb], Tiago A. M. Silva[r], Jeroen Steenbeek[p], Charles A. Stock[q], Philippe Verley[cc], Jan Volkholz[l], Nicola D. Walker[r], and Boris Worm[a]



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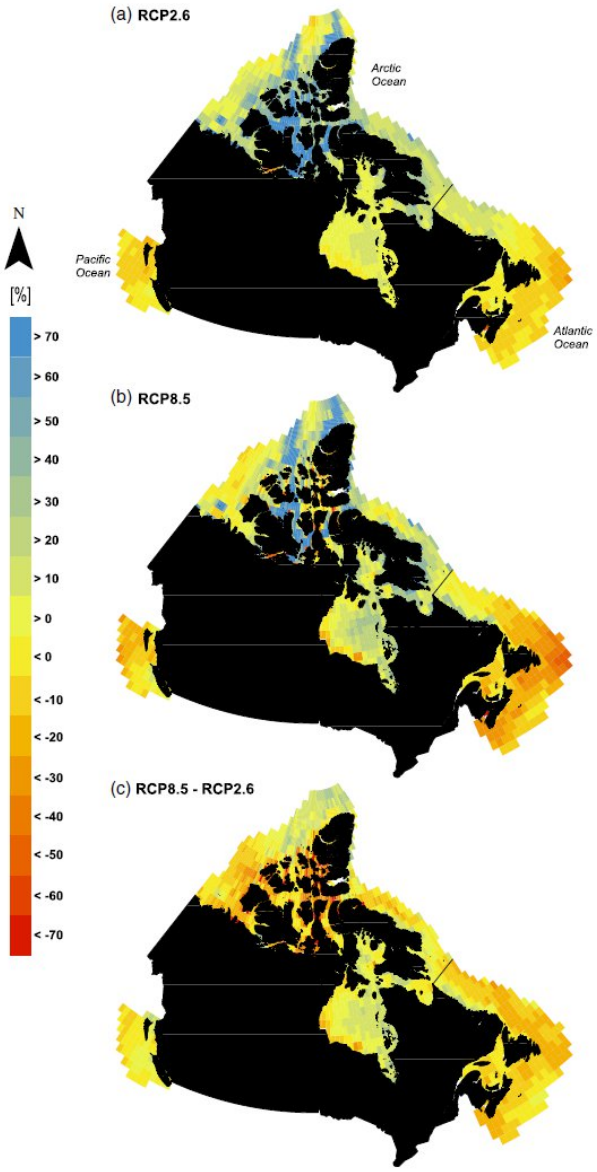

Differing marine animal biomass shifts under 21st century climate change between Canada's three oceans

Andrea Bryndum-Buchholz[a*†], Faelan Prentice[a†], Derek P. Tittensor[a], Julia L. Blanchard[b], William W.L. Cheung[c], Villy Christensen[d], Eric D. Galbraith[ef], Olivier Maury[gh], and Heike K. Lotze[a]

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ARTICLE

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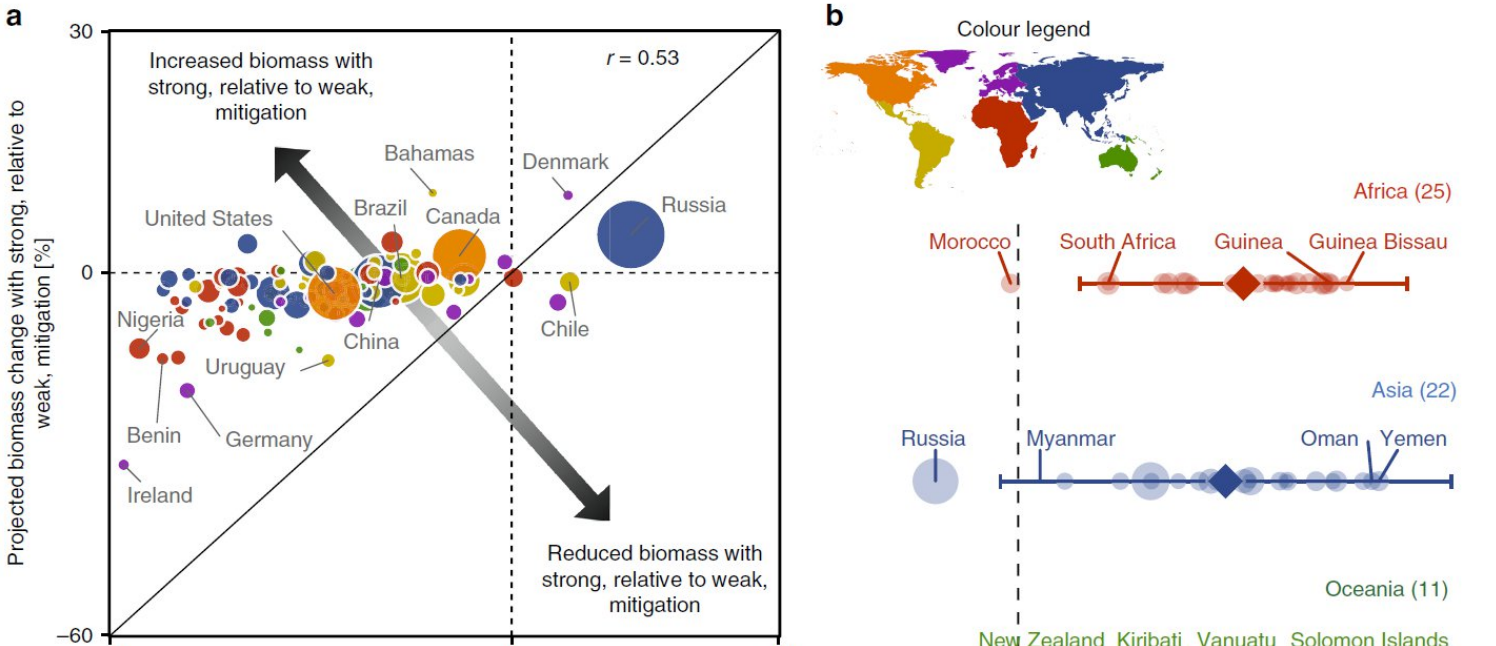
Check for updates

Future ocean biomass losses may widen socioeconomic equity gaps

Daniel G. Boyce [1,2]✉, Heike K. Lotze [2], Derek P. Tittensor[2], David A. Carozza[3] & Boris Worm [2]



ISI-MIP 3 simulations

- **FishMIP Phase 1: 2020**

FishMIP Phase 1 2020 Protocol [ISIMIP3b]

Global Models

- Aiming for Nov. 1 IPCC AR6 deadline
- Reduced set of scenarios and forcings
- Very simple future fishery scenarios (held constant at 2015 levels)

FishMIP Phase 1 proposed outputs

- Global model simulations (CMIP6)
- Regional model simulations (CMIP6)

- Regional / Global model comparison (ISIMIP 2b)
- Simulations separating effects of temperature and primary productivity (ISIMIP 2b-ish)
- Marine ecosystem model emulator? (ISIMIP 2b)

ISI-MIP 3 simulations

- **FishMIP Phase 2: 2021**
- Full set of ISI-MIP 3b scenarios, ESMs
- Fishery specific future scenarios (OSP+)
- Attempt to reconstruct pre-1950 fishing effort

- Attribution / 3a runs? (TBD)
- Outputs TBD (late 2021)
- New FishMIP leadership

The Oceanic System Pathways OSP

FISHERIES & MARINE ECOSYSTEM
FISH-MIP
MODEL INTERCOMPARISON PROJECT

- **Extend the SSP storylines to oceanic fisheries:** 1st workshop, UNESCO-IOC (Nov. 2013)
  - Scientists from various fields,
  - Representatives from the European fishing industry
  - International organizations

United Nations Educational, Scientific and Cultural Organization

Intergovernmental Oceanographic Commission

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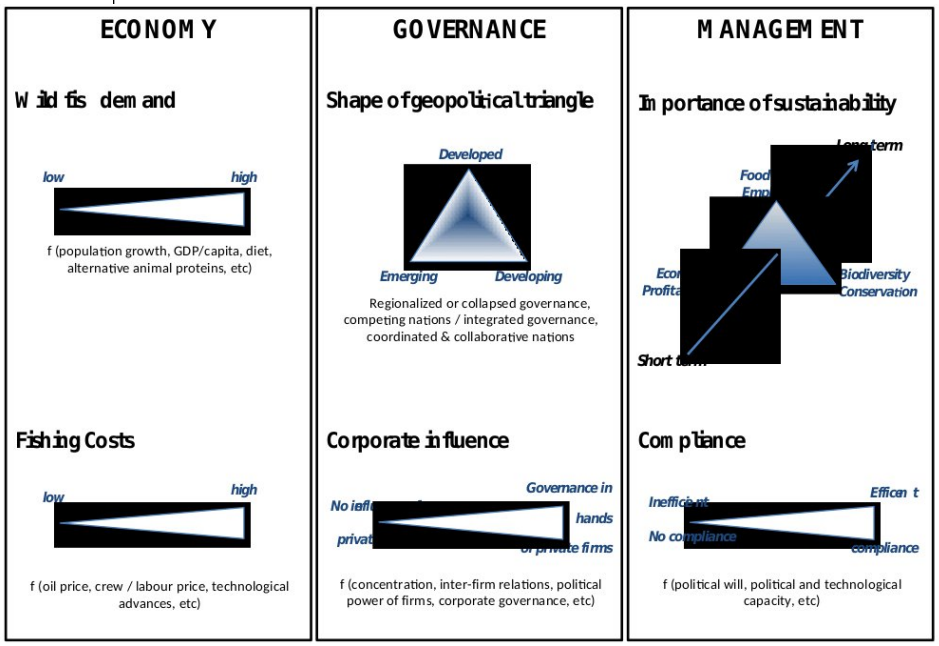
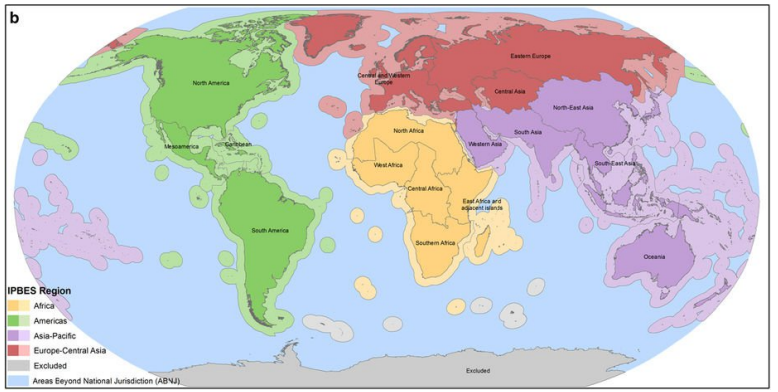
From shared socio-economic pathways (SSPs) to oceanic system pathways (OSPs): Building policy-relevant scenarios for global oceanic ecosystems and fisheries

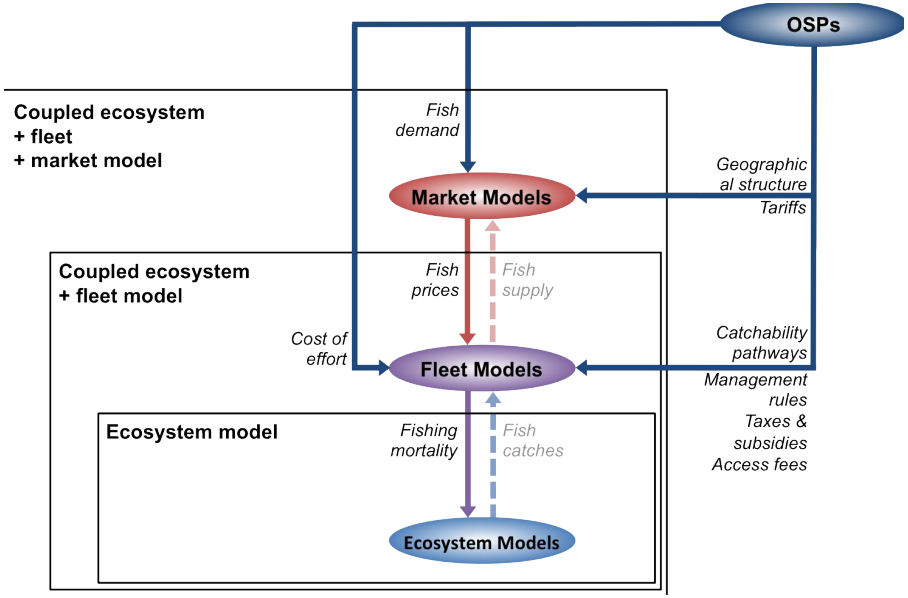
O. Maury[a,b,*], L. Campling[c], H. Arrizabalaga[d], O. Aumont[e], L. Bopp[f,g], G. Merino[d], D. Squires[h], W. Cheung[i], M. Goujon[j], C. Guivarch[k], S. Lefort[f], F. Marsac[a,b], P. Monteagudo[l], R. Murtugudde[m], H. Österblom[n], J.F. Pulvenis[o], Y. Ye[p], B.J. van Ruijven[q]



- Extend the OSP storylines to **global fisheries** (2nd workshop October 2019)
  - *Oceanic fisheries*
  - *Demersal & benthic fisheries*
  - *Small pelagic fisheries*
  - *Aquaculture*



- Regionalize the OSPs and consider short- (2030) to mid- (2050) to long-term (2100) time horizon
- Turn the storylines into quantitative model's drivers
- Drive the FishMIP coupled marine ecosystem & fisheries simulation models



- Derive scenario-based model envelope projections