

Managing in Times of Transition:

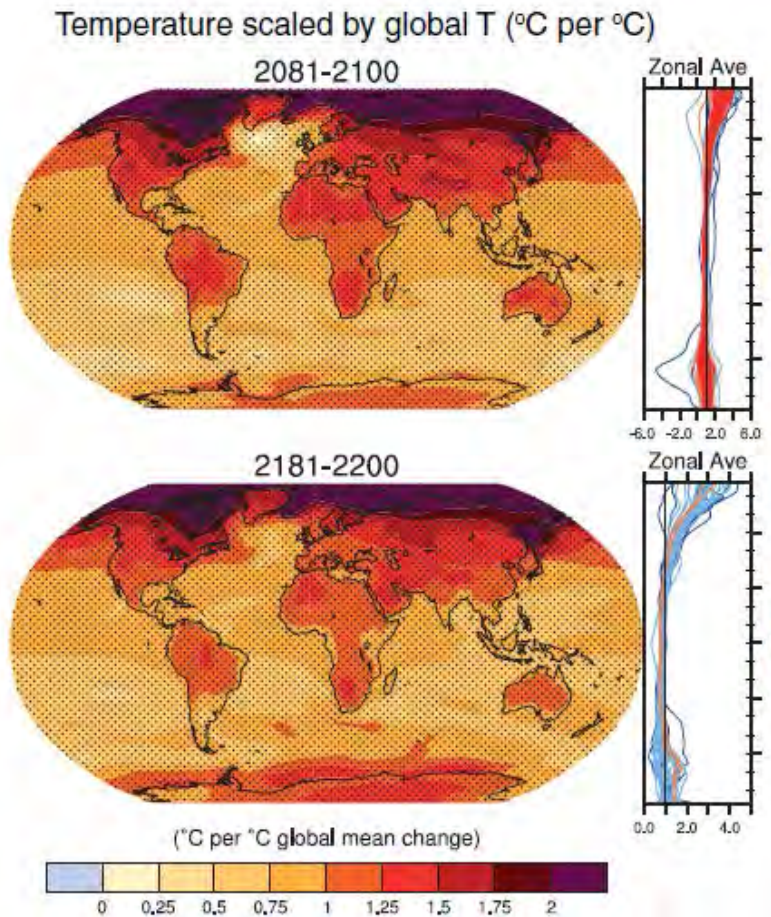
How policy and management should react

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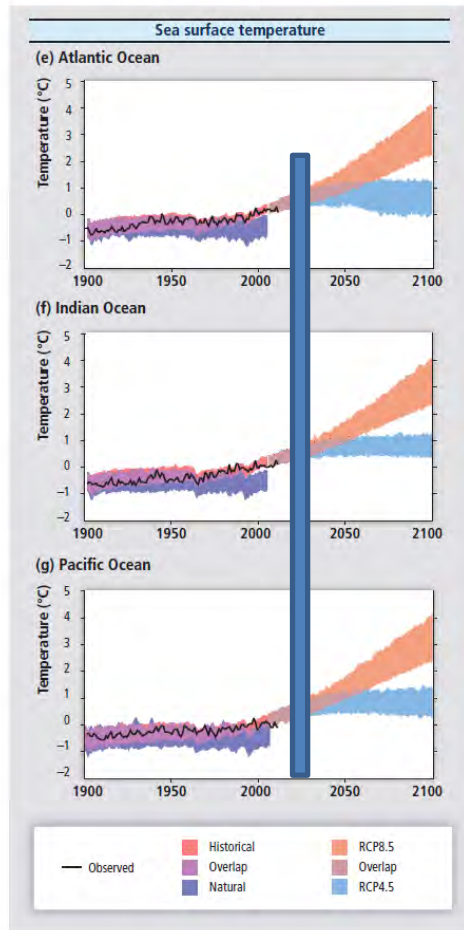
Fisheries and Oceans Canada

How we often present our concerns about climate change



- Shows how different the future will be from the present
- Invites thinking about policies for that very different world – What policies will be viable “then”.
- Illustration is from IPCC AR 5 WG I Figure.12.10

What will be experienced by people is a transition, not an abrupt change.



- Different scenarios all diverge from common present.
- Policies on EMISSIONS will determine which trajectory
- Policies on livelihoods may have to PREPARE for the endpoint, but DEAL with the immediate transition
- Illustration – IPCC AR 5 WG II Figure 2.30.2

What characterizes the information we give policy-makers NOW

- Confidence that ocean change (physics, chemistry and biology) is happening – HIGH
- Confidence in direction of change - HIGH
- Confidence change cannot be avoided - HIGH
- Confidence in what conditions will occur and when – LOW
- Confidence we know generally how ecosystems will be affected – MOD
- Confidence we know exactly what (biology) will change and by how much – LOW (especially in the transition window)
- Confidence that research can reduce uncertainty – HIGH

Confidence that research can move the “LOW” areas to MOD-HIGH within a 5-10 year policy window - LOW

So what does this mean for the Science – Policy Interactions

- Science can explain the need for change.
- Science can generally characterize the types of things that are expected to happen.
- Science will be hard pressed to answer questions about exactly what will change by how much and when.
- Therefore we should be looking to support policies of transition and adaptive response, not new configurations for fisheries (or other industries) for some set of future conditions

This context has always been challenging for Science-Policy

- Need for policy action when the Science advice shows:
 - Confidence change was happening - HIGH
 - Confidence in direction of change – HIGH
 - Understanding of causal mechanisms – LOW/MOD
 - Could EXPLAIN many mechanisms but quantify FEW
 - Confidence in estimates of rates of change and endpoints
 - LOW/MOD
 - Confidence in estimates of socio-economic consequences
 - HIGH

These are not the finest hour for Science and Policy

- Interests who fear to lose during transitions DO self-identify and DO enter the policy dialogue
- Risk of false alarms VERY hard for policy-makers
Common challenge to Science - Yes we need action but do we need it NOW and that severe?

OUTCOME – DELAY ACTION UNTIL PROPER COURSE IS CLEARER

Examples include

- Canadian East Coast groundfish - late 1980s
- Pacific North American salmon – 1990s
- North Sea cod – 1990s
- Where are the real policy imperatives?? (NOT 2100)

IPPC UNDERSTOOD THIS

Highlights the web of possible pathways forward.

We are seeking policies that both:

Motivate movement 😊

and

Care for those affected by transitions 😞

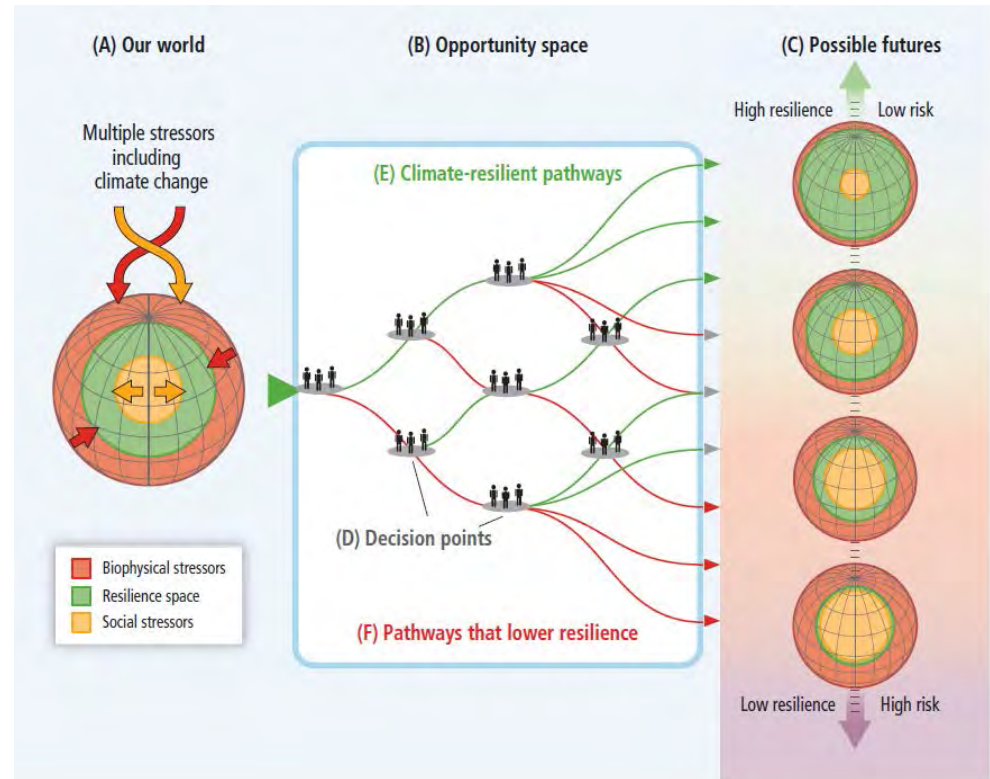


Illustration IPCC AR 5
WG II Figure 1.5

But are we working to provide
the right things to inform policy?

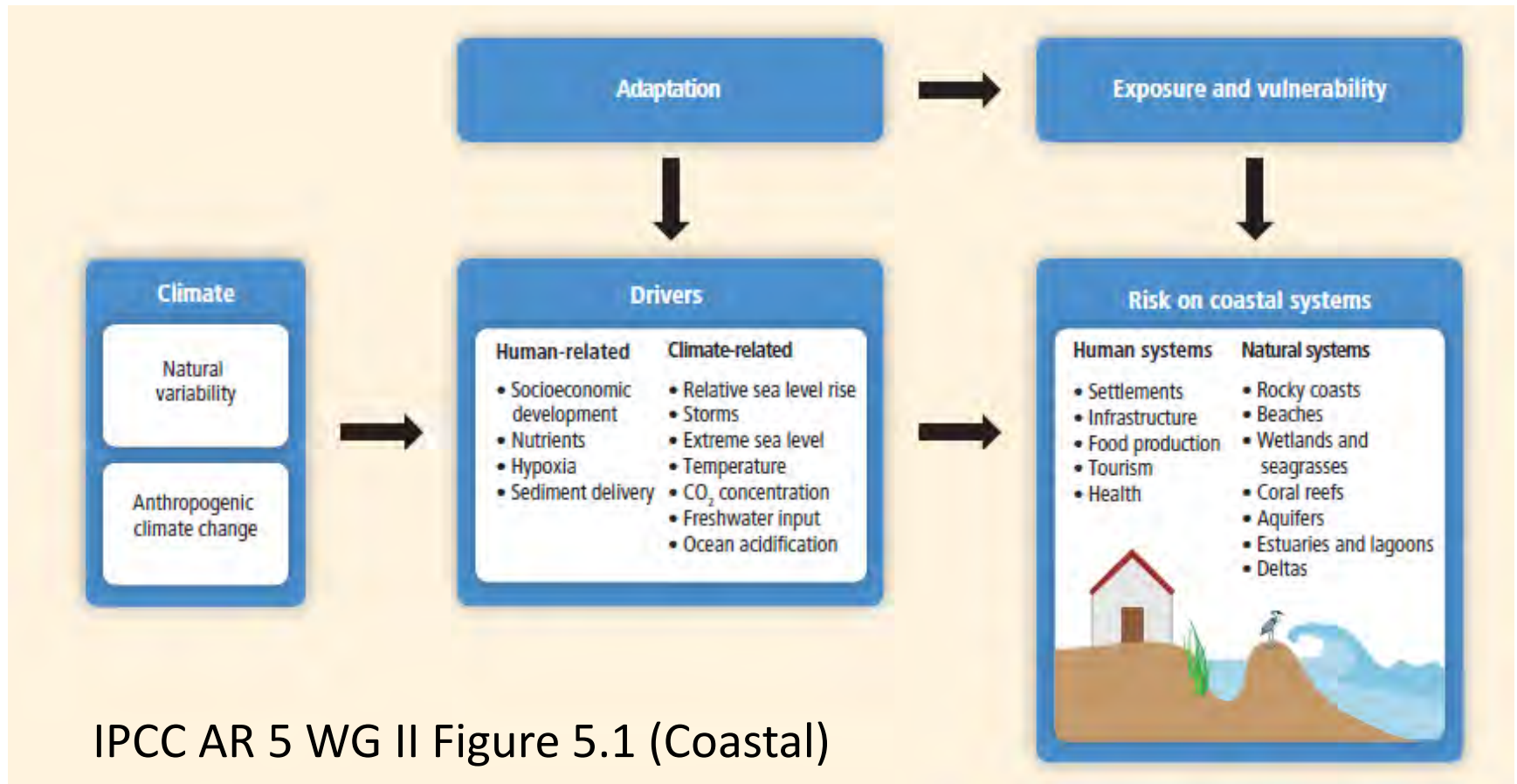
What will the transitions cost?

Who will bear those costs?

What can policy do to help?

(and pretending there are win-win-win options *in the short term* is not helping)

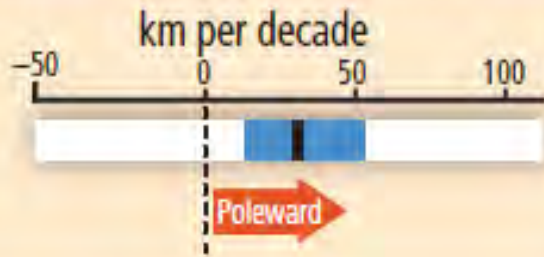
The IMPACT PATHWAYS are logically worked out



Quite detailed predictions of events offshore in the marine realm

(b)

Shifting distribution to cooler water



(c)

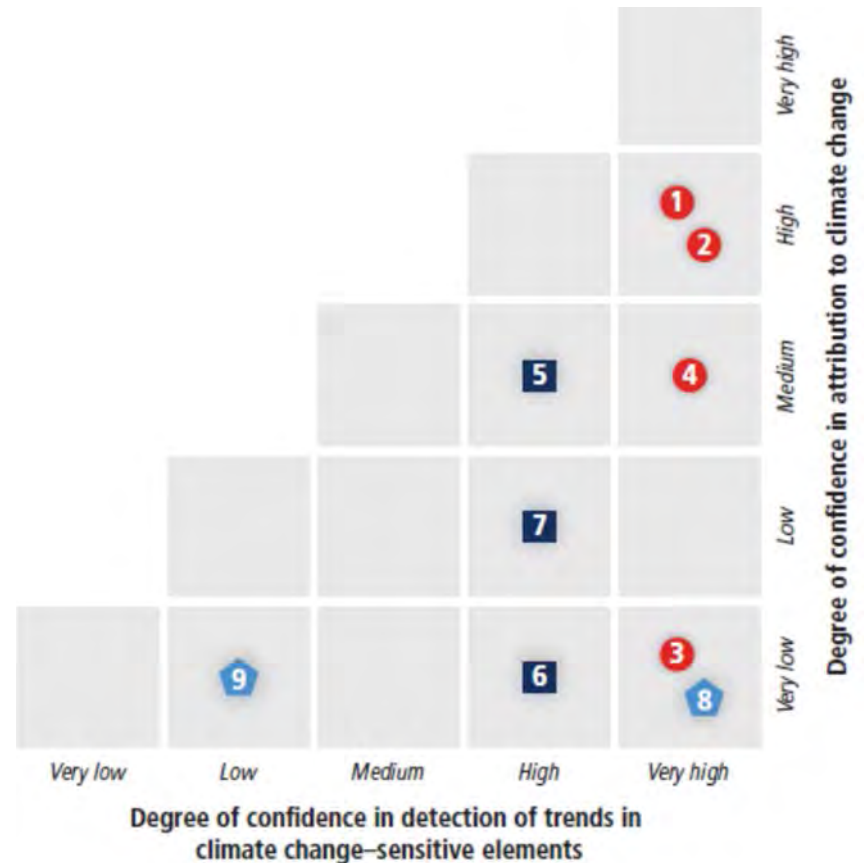
m per decade



- IPCC AR 5 WG II Figure 6-14b
- Forecast to the nearest km (with uncertainty) 31 km distance & 3.3 m. depth based on 610 species
 - (some challenges)
- Does allow for gradient planning
- NOT where the policy challenges lie

What about information for coastal forecasts?

- IPCC AR 5 WG II Fig. 5.5
- **Species and ecosystems**
 - **All HABITAT FEATURES**
- Coastal Processes
- 8 – Increased flood damage
- 9 – Decreased Harbour operations



How much INFORMATION there is? Looks reassuring in coastal .

	OPPORTUNITIES	CONSTRAINTS	LIMITS
COASTAL	AWARENESS CAPACITY POLICIES Learning Tools (innovation)	SOCIAL – CULTURAL GOVERNANCE BIOLOGICAL Economics Funding Information Physical	BIO-PHYSICAL Social-cultural (economic)
OCEANIC	Awareness Tools Policies	BIOLOGICAL Funding Information Physical	BIO-PHYSICAL

Fisheries

- FAO HLP on Fish and Food Security – 2014
 - Small scale (coastal) fisheries take ~ 50% of catch and provide > 80% of fish to poverty & food-insecure areas
- IPCC AR 5 WG 2 – Chapter 7
 - Acknowledges importance of small-scale fisheries
 - Vast majority of content on large-scale, mobile fisheries, or coral reefs, yet :
 - From bottom-up drivers predict “the vulnerability of coastal fisheries as a whole in 2035 ... is considered to be **low**. Extended to 2100, ... reductions in coastal fisheries production by 20 to **35%** in the west and **10 to 30%** in the east. “

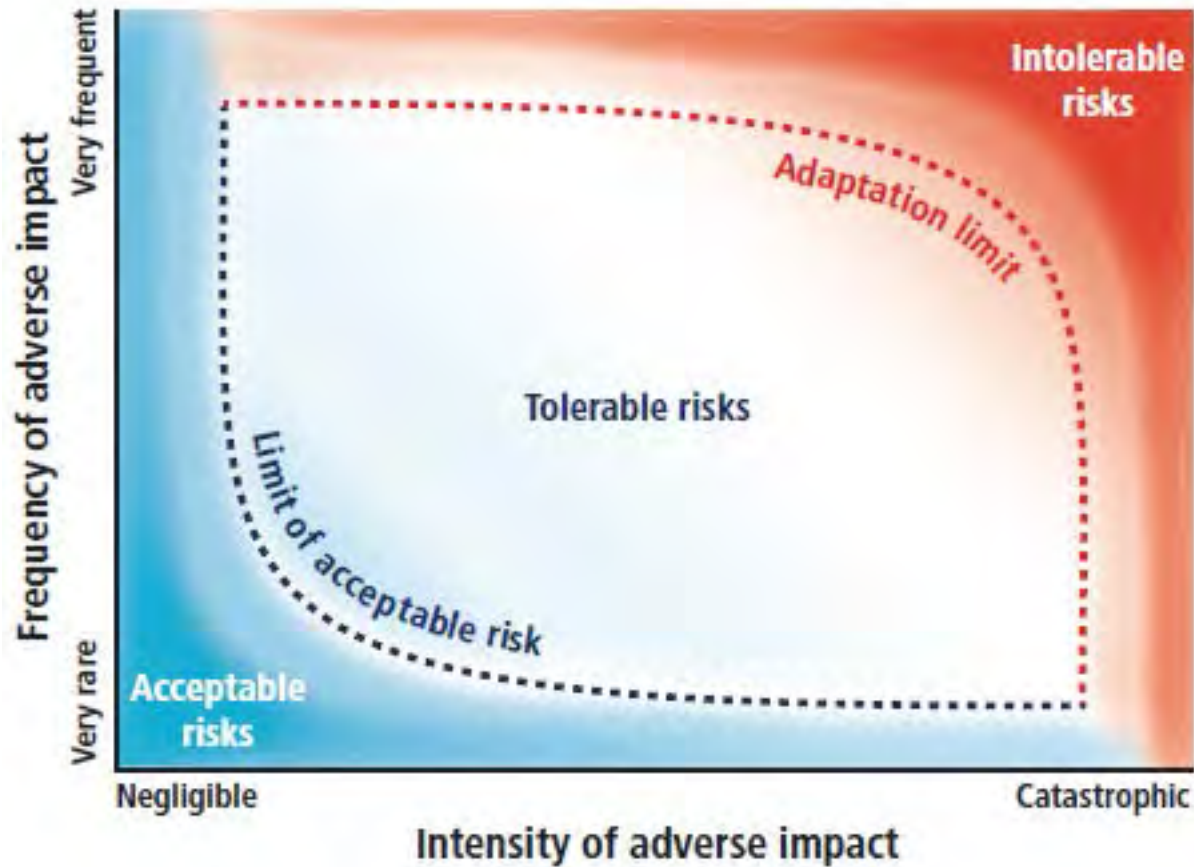
What does policy need to do?

- Focus on coastal fisheries
- Focus on allowing local adaptation to be exercised
 - Reconsider strategies for
 - Allocating rights, but de facto restricting movement
 - Closing off spatial harvesting options
- Focus on support for those affected by transition
 - We generally can identify who they are
 - Too much focus on finding “winners” to sell the policies. Help policy makers know the transitional “losers”
 - Policies to temporarily reduce dependence and allow experimentation

What does science need to do

- Accept that we will NOT be predicting how abundant/productivity specific species will be.
- Try to characterize how the fish communities supporting coastal livelihoods will change on decadal scale
 - Size spectrum parameter dynamics
 - Mix of demersal / pelagic / macro-invertebrate
- Collaborate with social scientists on how to transition livelihoods
 - Make local adaptation a learning process for all
- Remember precaution is managing risk, not avoiding it.
 - Small perturbations from which uncertainty is reduced

Fig 16.1 WG 2



RISK HAS TO
BE TOLERABLE
FOR SOCIETIES
AND
ECOSYSTEMS

And what a long strange trip it's been

So we leave finding the answers to you