Dynamic Coasts in an Era of Sea Level Rise: Implications for Baselines and Maritime Claims

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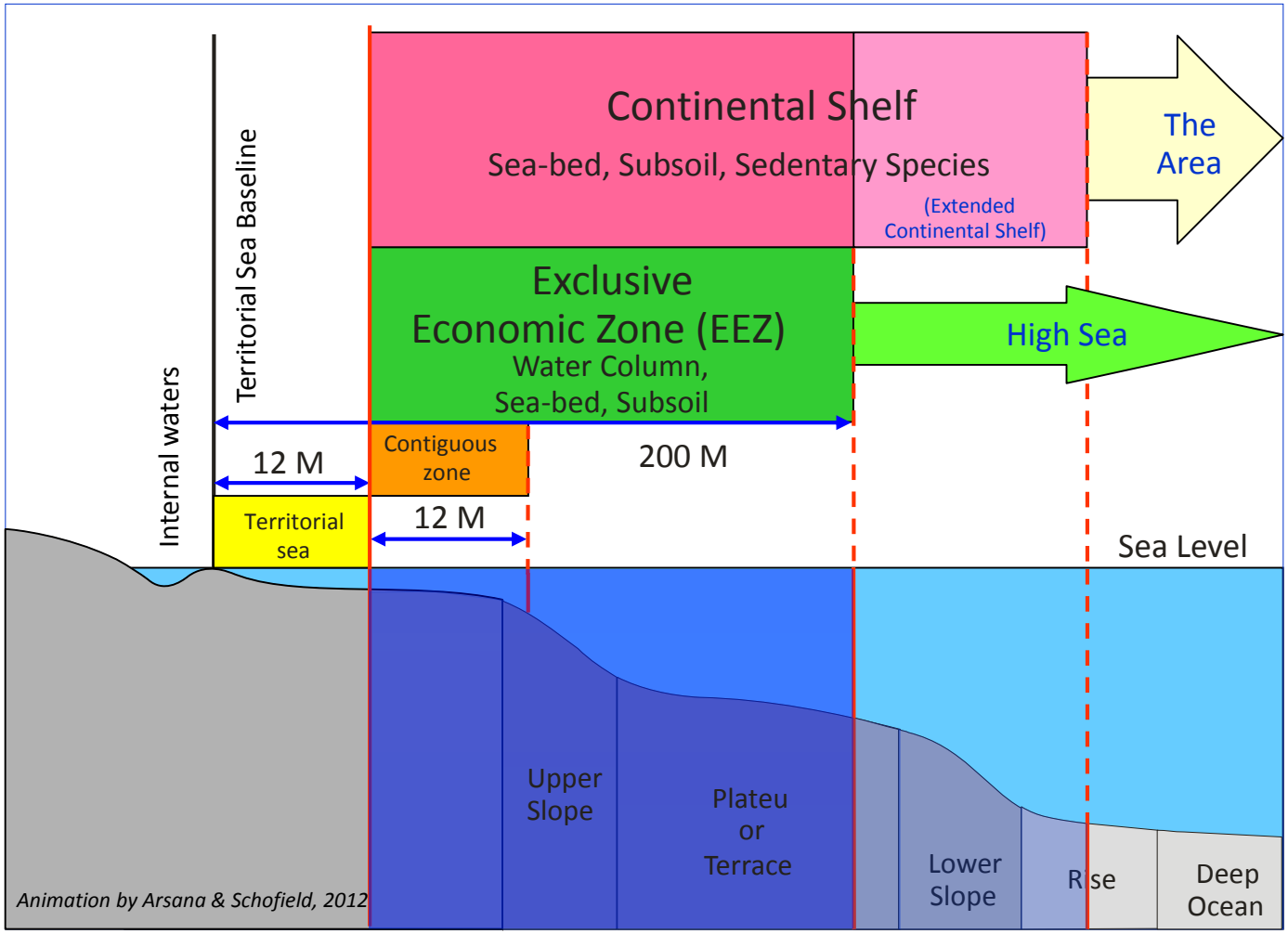
Baselines and Maritime Zones



Sea Level Rise

- Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (2013):
  - Multiple scenarios – up to **0.98m** rise by 2100
  - Compared to mean rise of 0.19m in 20th Century
  - Projections greater than AR4 thanks to improved modelling of grounded ice contributions
- Increasing rate of rise projected
  - From 1.7 mm/yr (1901-2010)
  - To 3.2 mm/yr (1993-2010)
- **BUT**: IPCC projections viewed as overly cautious primarily due to significant uncertainties over contribution of glaciers and grounded ice sheets to sea level rise

IPCC Special Report *Global Warming of 1.5˚C*, October 2018

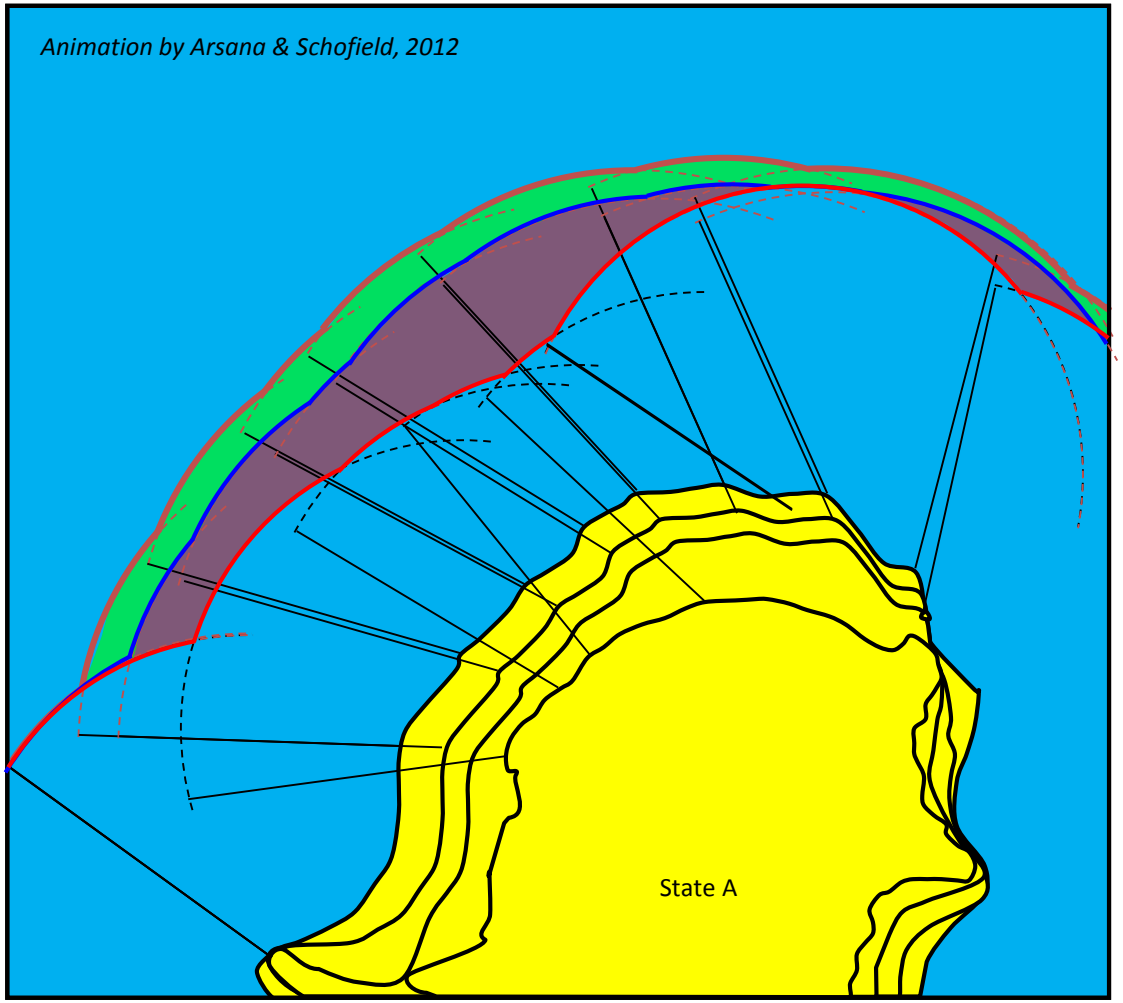
- Contrasts a 1.5˚C warmer world vs 2.0˚C warmer
- Very high risks to coastal ecosystems 'even' at 1.5˚C warmer
- Significant differences between 1.5˚C and 2.0˚C:
  - 90% of tropical corals gone as opposed to 99%
  - GMSL rise 0.1m less
  - Equates to 10.4m people not being exposed to the threat of sea level rise
- Report notes that recent scientific literature "strongly supports" assessment that SLR likely to continue well beyond 2100.

Ambulatory Baselines and Shifting Maritime Limits

- Maritime claims predominantly measured from ‘normal’ low-water line baselines
- Such baselines can be **“ambulatory”** and may be subject to major and rapid change
- Attempts to physically protect/fix coasts via sea defences/coastal engineering efforts fraught with environmental problems
- Ambulatory baselines and shifting limits increasingly problematic in an era of increasing sea level rise

Impacts of Sea Level Rise

Ambulatory Baselines – Shifting Limits?



Feedbacks between Land and Sea

- Beware of ‘bathtub modelling’!
- If sea level rises it does not necessarily simply ‘march up the contours’
- Dynamic and complex interactions between sea level and the coast/coastal ecosystems
- Coasts change/adapt both vertically and horizontally with sea level
  - e.g. Mangroves can potentially keep up with sea level rise by building up in situ

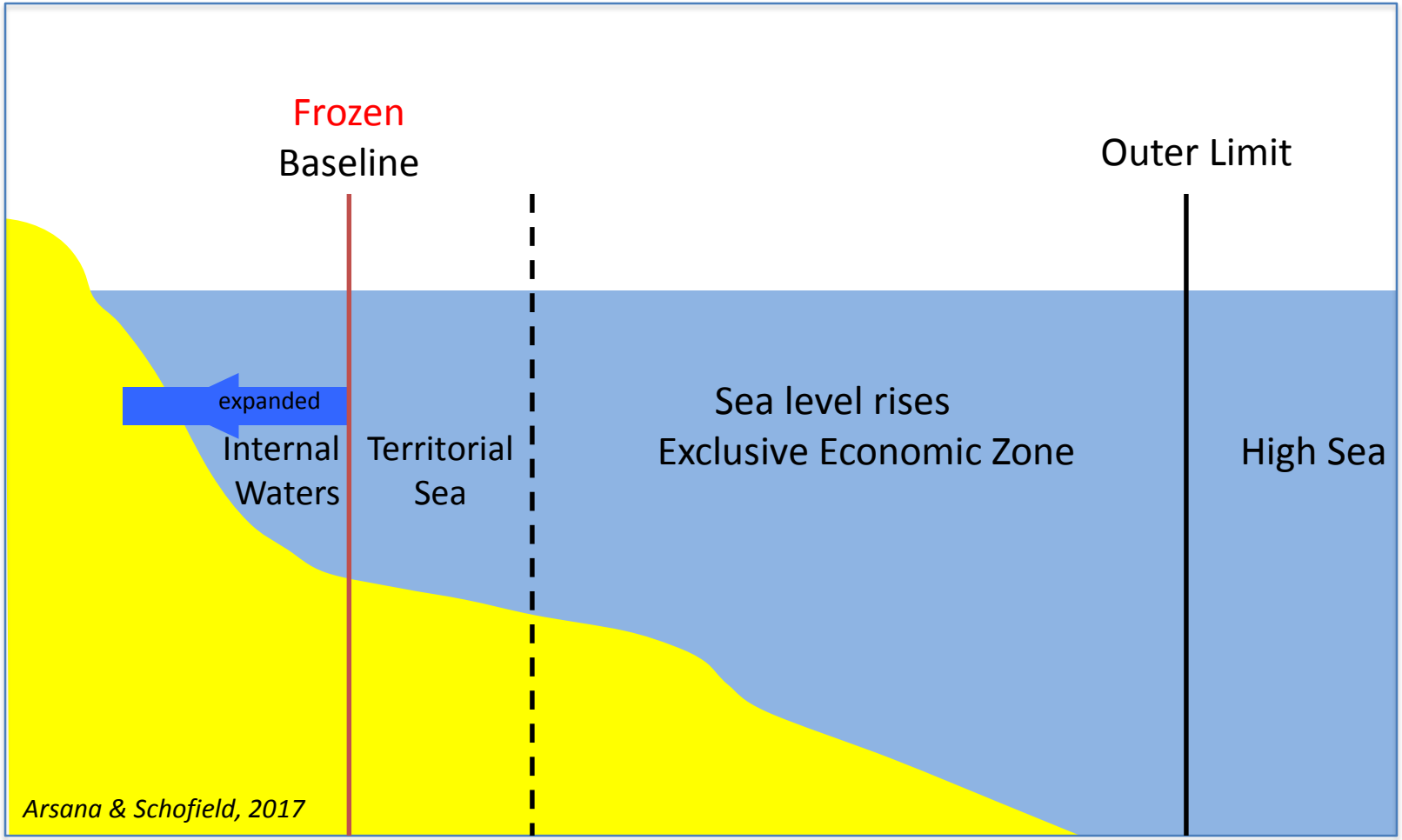
Responses

- Reduce emissions
- Reduce/mitigate non-climate change related impacts resulting from:
  - Coastal development
  - Reductions in sediment supply
  - Unsustainable agricultural practices
  - Over-fishing
  - Tourism
- Seek to maximise the opportunities for ecosystem adaption
- Build ecological resilience

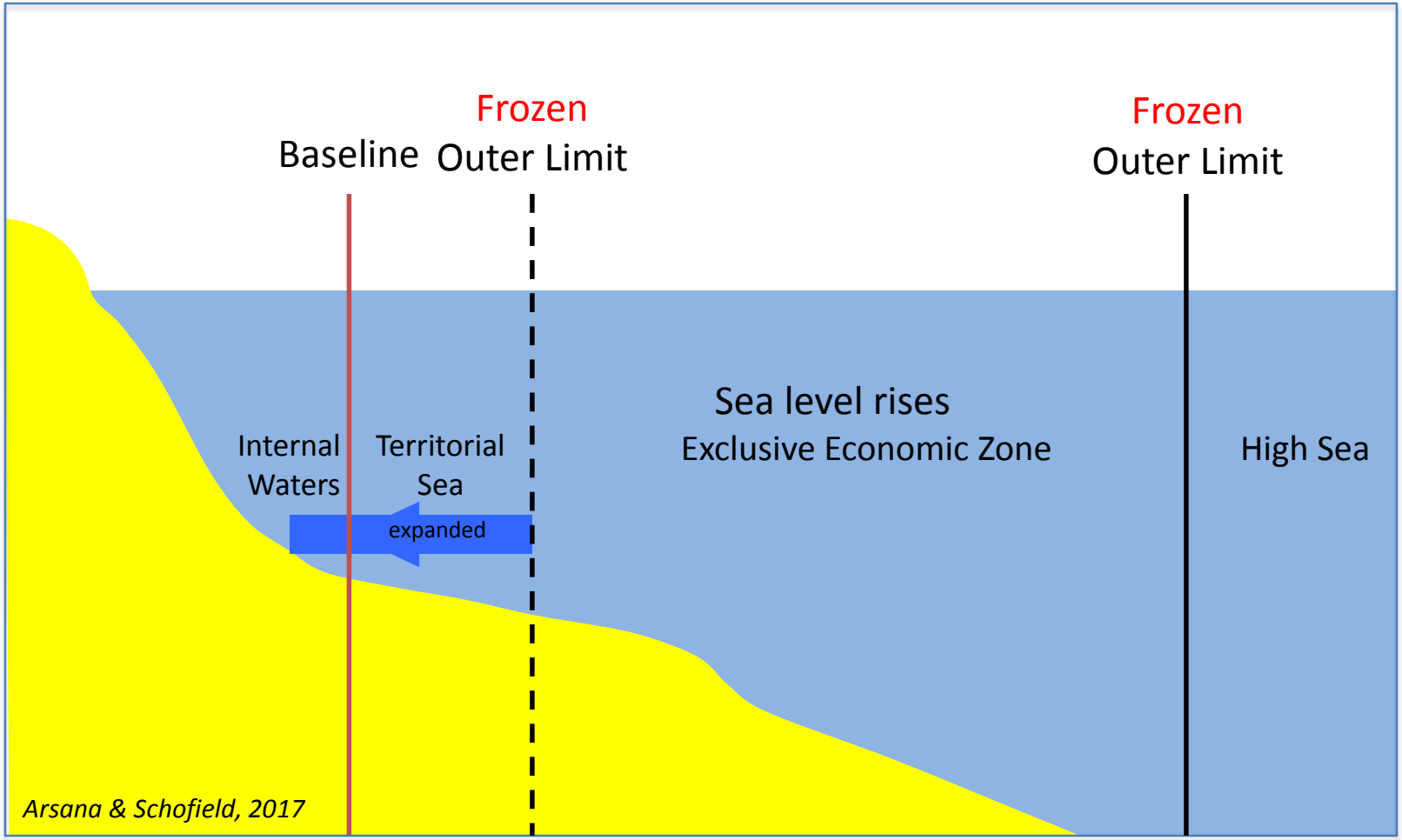
Emerging Responses: Fixed Baselines/Limits

- Emerging regional practice among the Pacific Small Island Developing States to:
  - Define baselines
  - Define limits and enshrine in domestic legislation
  - Delimit boundaries
  - Declare that "changes in sea level do not impact on the maritime jurisdictions of Pacific SIDS" (Pacific Oceanscape)

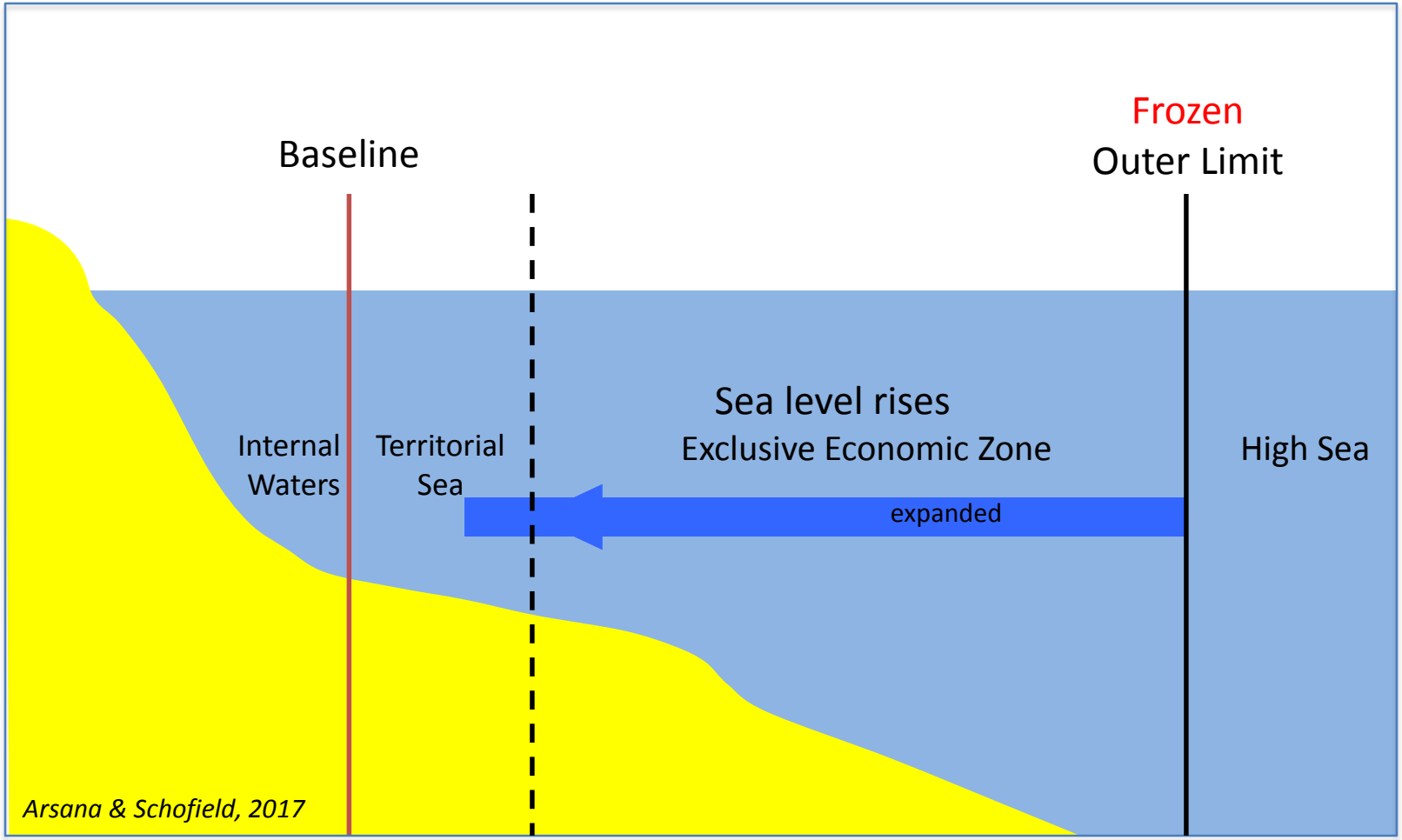
Fixing Baselines?



Fixing Limits?



Fixed EEZ Limit?



ILA Committees

- International Law Committees on:
  - Baselines
  - International Law and Sea Level Rise
- Baselines Committee Report concluded that normal baselines are ambulatory
- Sea-level Rise Committee of the view that existing maritime claims should be retained
- How can we reconcile fixed baselines and/or limits with retreating coasts?

Conclusions

- Sea level rise accelerating
- Impacts on coasts and therefore baselines inevitable
- Seas will rise long beyond the end of the century
- Adaptive approaches to coastal management offer a way to help to mitigate the impacts of sea level rise on coastal ecosystems
- Fixing baselines/limits increasingly supported by State practice but notable pros and cons.
- If baselines limits *can* be fixed: **does the land no longer dominate the sea?**