



# Challenges for Policy makers and Managers

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What's new – that policy makers need to address?

- **Changes are fast**
  - **Productivity**
  - **Distribution**
  - **Marine ecosystem**
- **Changes are trends, not just variability**
- **Governance change is needed**



# Climate effect and response both ways

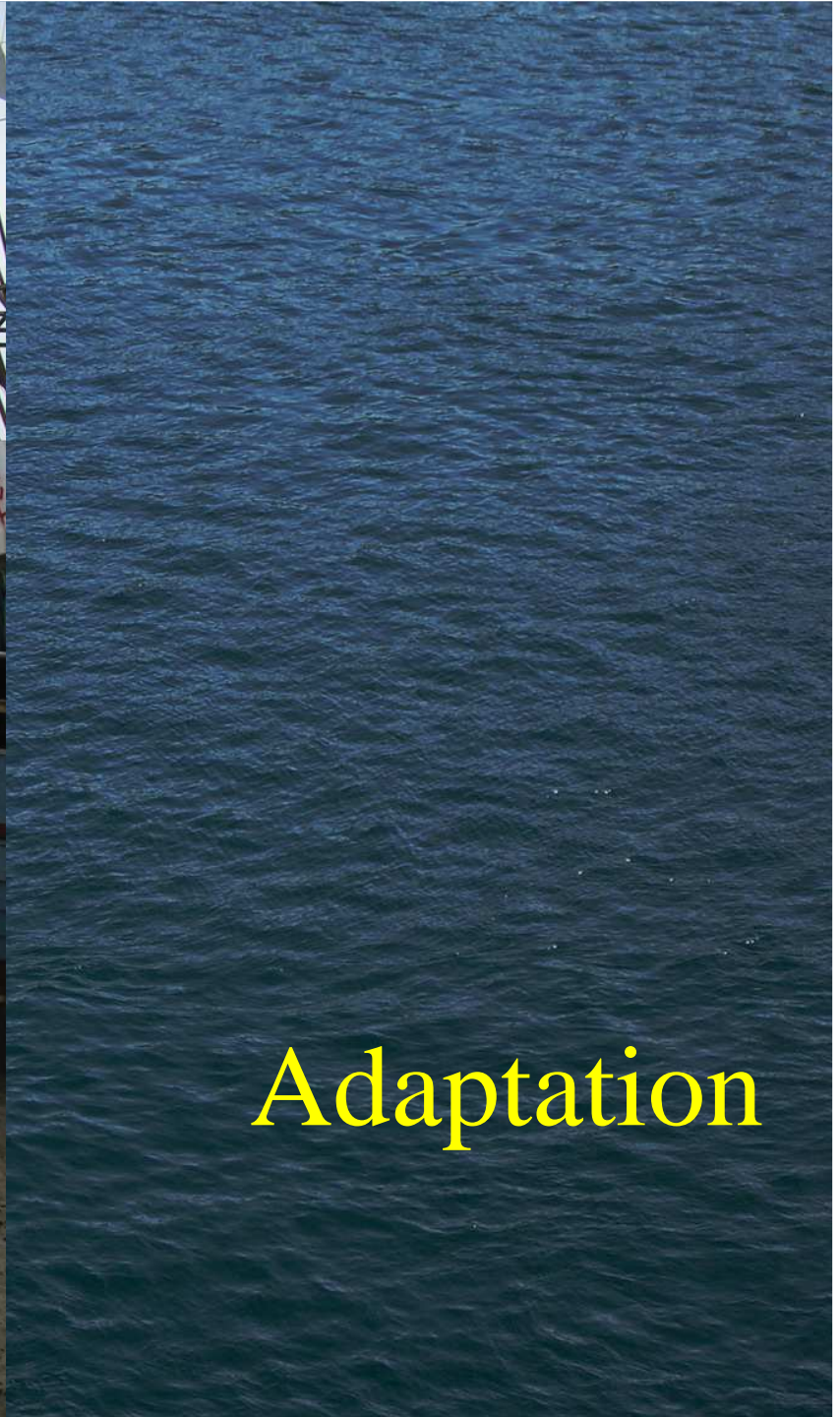
- **Climate impact fisheries**
- **Adaptation**
- **Fisheries impact climate**
- **Mitigation**



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- **Fisheries must contribute to mitigation**





Adaptation



## Policy response

- **The effects of climate change on fish stocks are unpredictable as the linkages from the physical changes to the ecosystem are complex and non-linear**
- **It is therefore too early to consider policy and management implications**



# Management response

- The effects of climate change on fish stocks are to some extent unpredictable as the linkages from the physical changes to the ecosystem are complex and non-linear
- ~~It is therefore too early to consider management implications~~
- The consequences will be very significant and we know something about what they are and their direction
- We must now set up management frameworks which
  - Do not undermine the resilience of the marine ecosystem
  - Will be responsive and responsible as changes appear



- **Changes are fast**

- **Productivity**

- **Distribution**

- **Marine ecosystem**

- Responsive decision making

- Prepare for access change

- Integrate in ocean governance

- **Changes are trends, not just variability**

- Change to be hardwired in governance

- Dynamic reference points

- **Governance change is needed:**

- Prior rules for redistribution of access rights

- Move to dynamic and responsive approach

- Fully embrace an ecosystem approach



# Distribution of access

**Changes in distribution have led to irresponsible fisheries – therefore prior action is needed:**

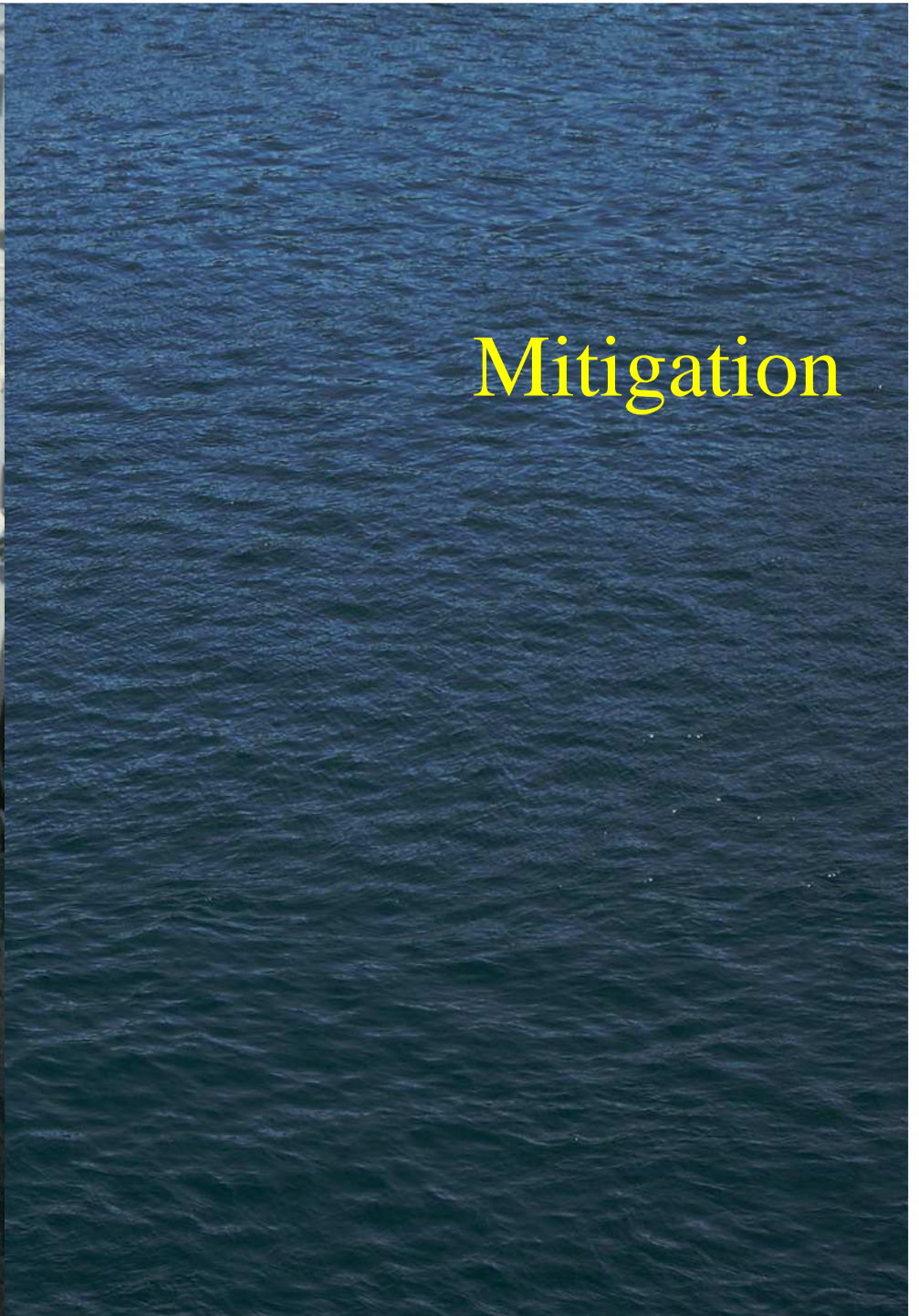
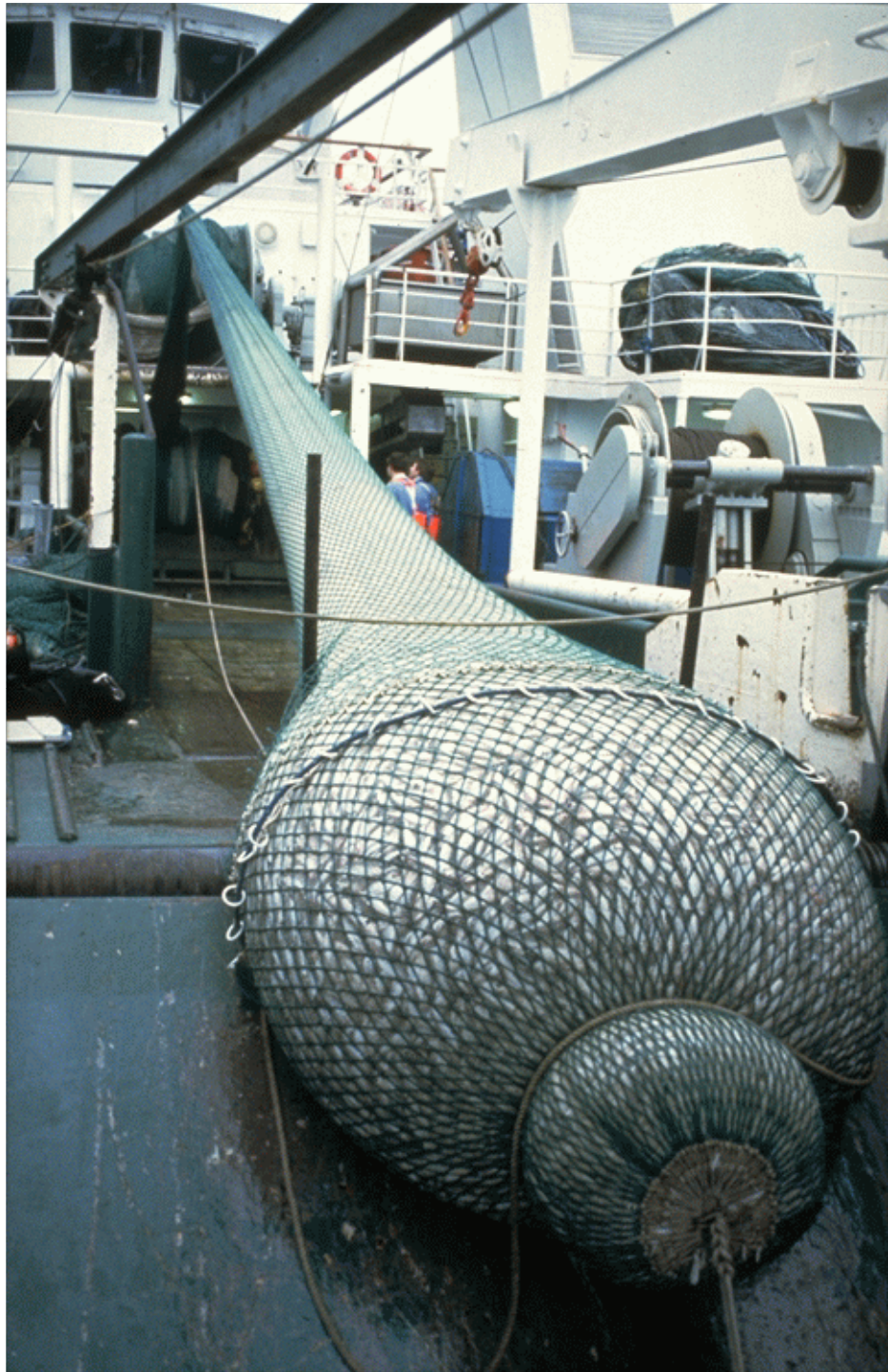
- **Close any legal loopholes to prevent emergence of IUU fisheries**
- **Distribution of existing fishing opportunities – a redistribution of access to fish stocks is best agreed if rules for redistribution (or not) have been agreed beforehand in relevant fora**
- **Agreed rules need to be in place for distribution of access to 'new' stocks - it is difficult to reverse overfishing**



# Responsive and adaptive management

- **Knowledge base**
  - Reduce delay from event to pick-up
  - Different science
    - Management strategies based on indicators
    - Use of other data sources
  - Science to develop/evaluate the above
- **Institutions/decision making process**
  - Institutional framework enabling response to change
  - Management plans to include criteria for change
  - Rights regime enabling response to change
- **Legal framework**
  - Based on assumption about dynamic stocks and ecosystems
  - Formal rules for adaptation

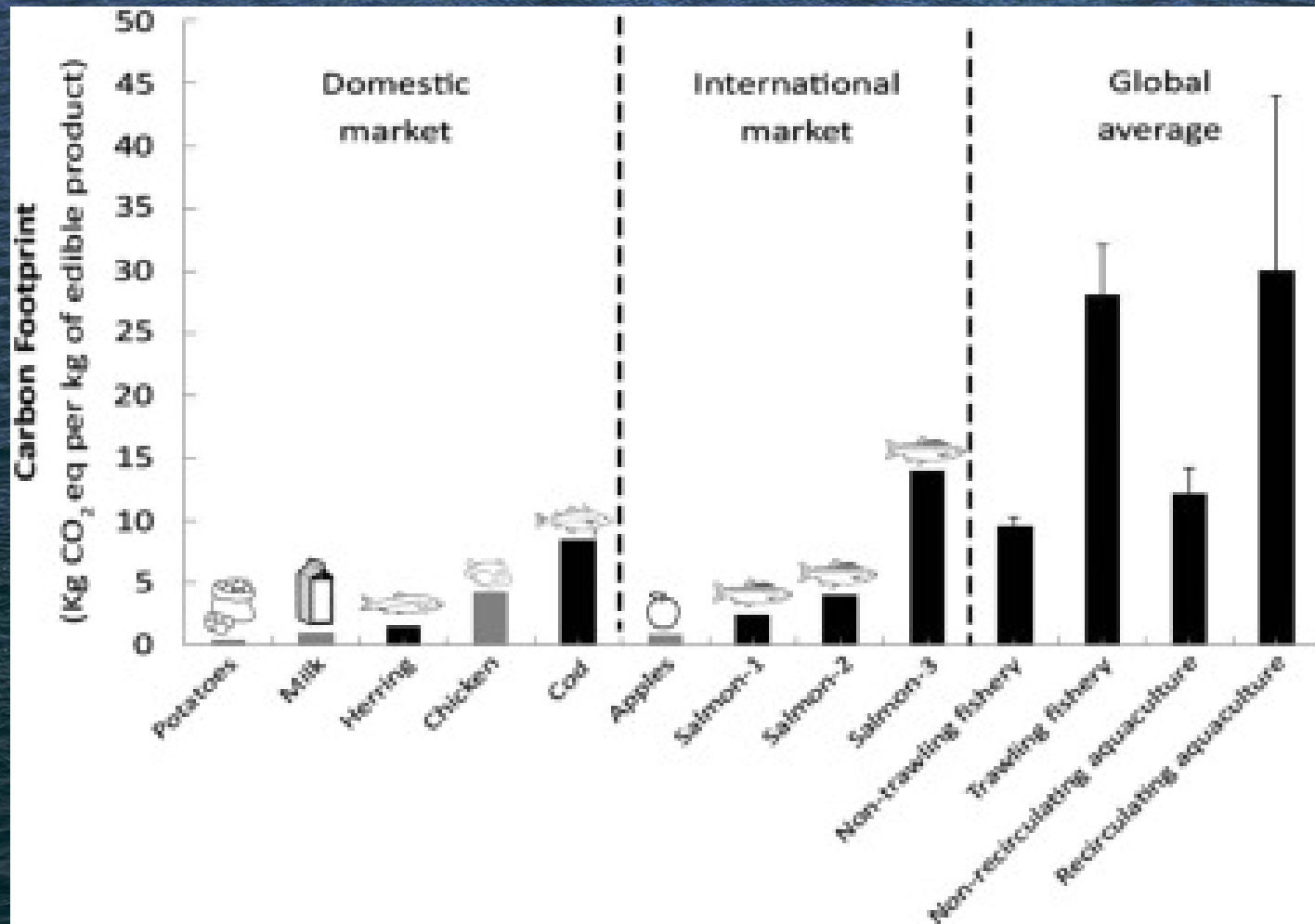




Mitigation



# Where is fisheries policy when it comes to MITIGATION ??



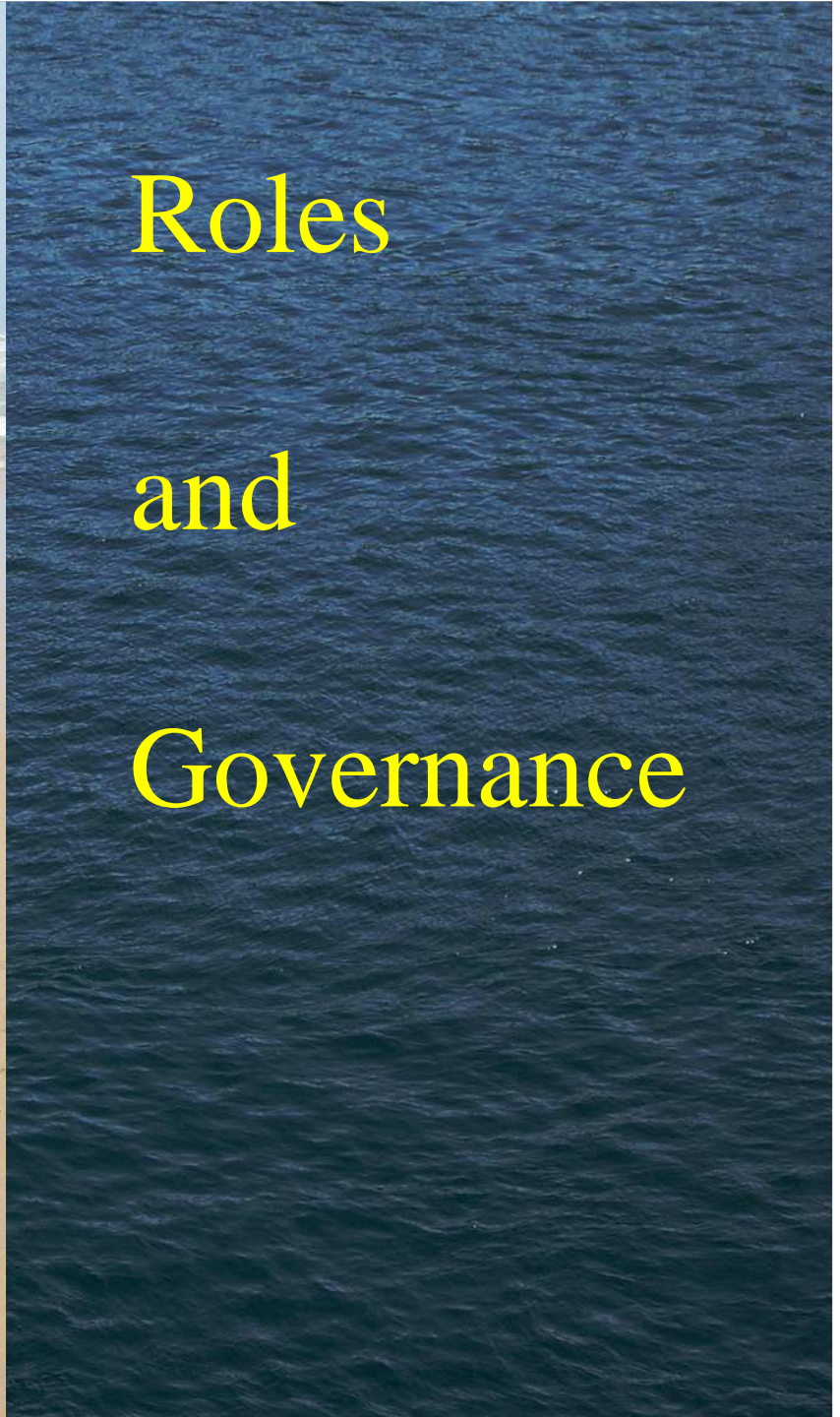
Source Madin and Macreadie 2016



# Mitigation – contribution from fisheries

- **Higher energy efficiency**
- **Main effect: do what we are trying to do for other reasons:**
  - **Rebuild stocks → higher CPUE → less fuel per kg landed with same technology**
  - **Reduce effort and fleet capacity**
- **Change to more energy-effective gear (same fishing method) – likely to also have less impact on habitat**
- **Change to more energy-effective fishing tactics**
- **Incentives - Certification? Fuel Tax? Direct regulation? Information?**





Roles  
and  
Governance



# Role of governments

- **Develop adaptive management ensuring**
  - **sustainability for the stocks, the ecosystems, resource users and society**
  - **with concerned citizens and resource users**
- **Develop adaptive approaches for**
  - **the international negotiations and**
  - **subsequent national distribution of access.**
- **Mediate changing access opportunities while ensuring equality of access.**
- **Insist that fisheries should contribute to mitigation**



# Role of scientific community

- **Explore and highlight how climate change impacts marine ecosystems and fish stocks and**
- **Contribute to the development of adaptive management strategies**
- **In dialogue with society**





Positive note:

**The dynamic nature of marine ecosystems and the need for governance to work from that fact is now glaringly obvious!**



Thanks for your interest in this issue!

