

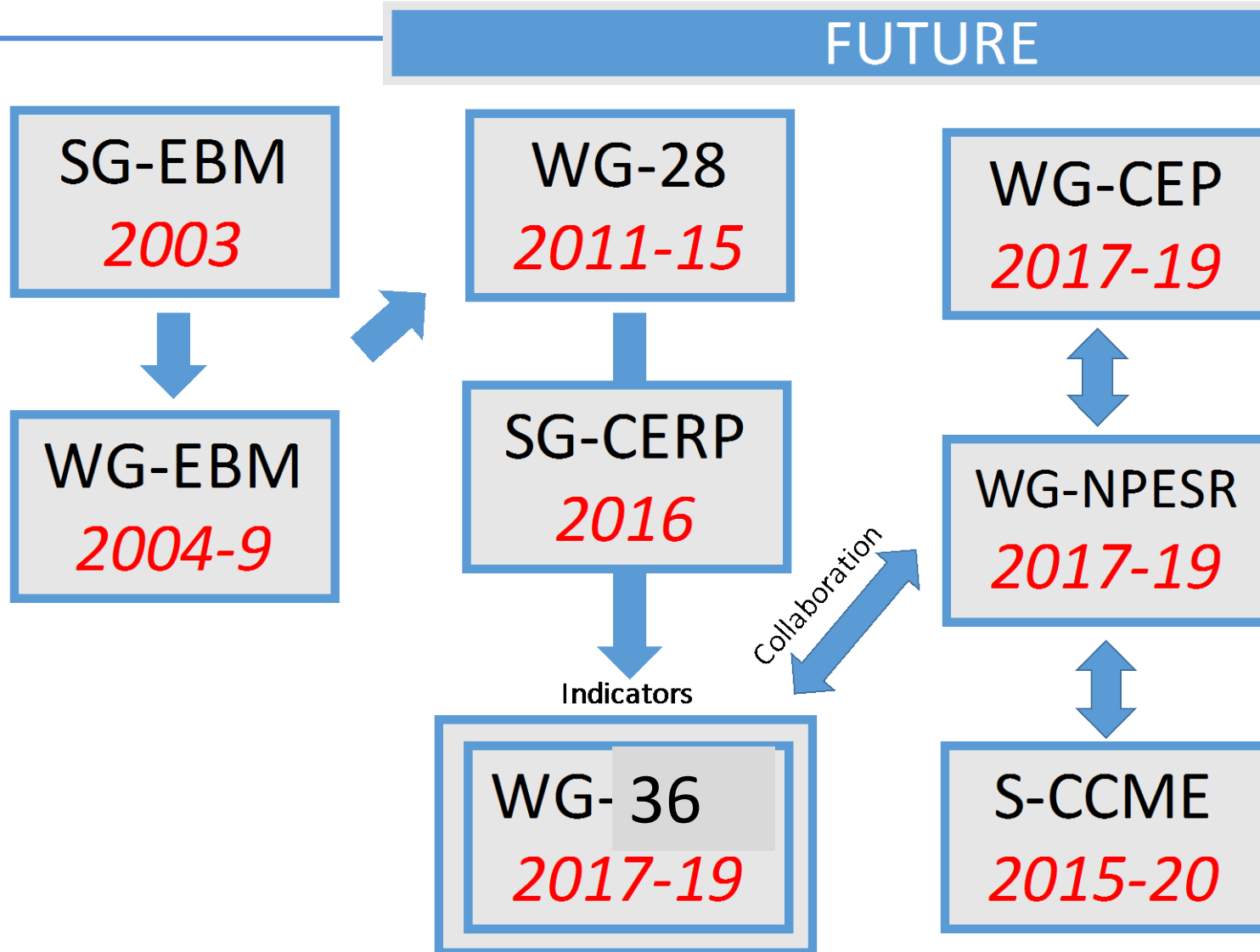
WG-36 Report to FUTURE

WG-36: Common Ecosystem Reference Points (CERP)



2018 PICES Annual Meeting
Yokohama, Japan

WG-36 Report to FUTURE



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Reference points for management are often determined under a single set of environmental conditions with a single species focus.

- Can we develop common ecosystem reference points that incorporate both societal need and climatic variability?
- How do ecosystem reference points compare among PICES member nations?

WG-36 Report to FUTURE

- **Co-chairs: Mary Hunsicker (USA) and Xiujuan Shan (China)**
- Members:
 - Elliott Hazen (USA)
 - Jennifer Boldt (Canada)
 - Robert Blasiak (Japan)
 - Kazumi Wakita (Japan)
 - Mitsutaku Makino (Japan)
 - Vladimir Kulik (Russia)
 - Yanbin Gu (China)
 - Sangchoul Li (Korea)
 - Jongseong Ryu (Korea)



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• Anticipated (2017-2019)

Timeline

TORs – Year 1

- 1 – governmentally relevant reference points
- 2 – Select ecosystems and indicators
- 3 – Assess methods for reference point designation

TORs – Year 2

- 4 - Run reference point methods on selected indicators and ecosystems.
- * First manuscript submission on N. Pac. reference points.

TORs – Year 3

- 5 Identify potential leading indicators based on reference points
- 6 Develop heuristic model (e.g. structural equation models) to assess ecosystem state.

Deliverables

- Intersessional workshop (2017)
- Meeting + WS (PICES 2017)
- Annual report to FUTURE

- Topic session in PICES 2018
- Annual report
- Manuscript 1

- Workshop in PICES 2019
- Topic session in PICES 2019
- Manuscript 2
- Final report

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Completed activities:

- An intersessional 2-day workshop “[Quantifying thresholds in driver-response relationships to identify reference points](#)” at the ICES/PICES Climate Change Symposium in Washington, D.C. in June 2018;
- Revised TORs for joint PICES/ICES WG-CERP (submitted to ICES and PICES leadership)
- Joint ICES/PICES theme session on [tipping points](#) at the 2018 ICES ASM in Hamburg, Germany
- Joint ICES/PICES theme session on [Sustainability Thresholds and Ecosystem Functioning](#) at the 2018 ICES ASM in Hamburg, Germany
- 1-day workshop on “[Identifying common reference points and leading indicators of ecosystem change](#)” at the 2018 PICES annual meeting;
- 1-day business meeting at the 2018 annual PICES meeting;

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Proposed work plan for joint PICES/ICES WG-CERP

YEAR 1	YEAR 2	YEAR 3
Review and synthesis of existing policy drivers and methodological development for ecosystem indicators and associated reference points to support EAFM/EBFM in the ICES and PICES areas	Develop methodologies to assess the performance of ecosystem indicators and associated reference points.	Evaluate the performance of ecosystem indicators and associated references points in selected case studies. Use the results as a basis to provide guidelines to IEA groups for establishing ecosystem reference points

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Intersessional workshop “Quantifying thresholds in driver-response relationships to identify reference points”



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Intersessional workshop “Quantifying thresholds in driver-response relationships to identify reference points”

➤ **Day 1 (closed):**

- ✓ WG members reviewed and made progress on TORs;
- ✓ Discussions with IndiSeas scientists about related efforts;

➤ **Day 2 (open):**

- ✓ learned about similar efforts from other organizations/regions;
- ✓ Identified potential partnerships between PICES and other groups to advance the science of ecosystem thresholds;

Invited speaker: Scott Large (NOAA);

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ICES/PICES theme session “*Tipping points complex nature and implications to marine social-ecological systems management*”

–co-chaired by [Mary Hunsicker](#)

(2018 ICES ASM in Hamburg, Germany)

➤ Goal:

- ✓ To explore links and interactions between tipping points of different natures connected to shifts in marine ecosystems
- ✓ To explore implications of tipping points to marine ecosystem-based management.

➤ Presentations:

- ✓ Improved understanding of tipping point mechanisms;
- ✓ Support for more comprehensive marine management strategies.

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ICES/PICES theme session “**Sustainability Thresholds and Ecosystem Functioning: The Selection, Calculation, and Use of Reference Points in Fishery Management**”

Co-chaired by Xiujuan Shan (just paper work)

(2018 ICES ASM in Hamburg, Germany)

➤ Goal:

- ✓ To explore best practices and new approaches to selecting, calculating, and using reference points in fishery management;

➤ Presentations:

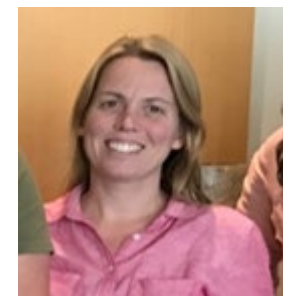
- ✓ Development of biological reference points, and how they are used in fisheries management;
- ✓ How harvest control rules (HCRs) utilizing single-species, multi-species, and ecosystem reference points performed for providing robust management advices;

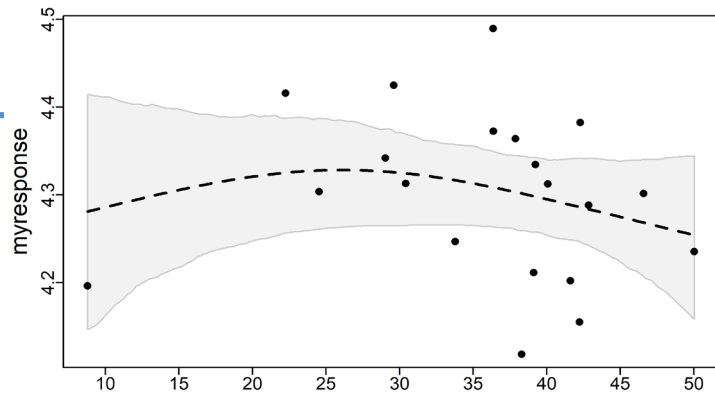
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➤ 1-day workshop “**Identifying common reference points and leading indicators of ecosystem change**” at the 2018 PICES annual meeting;

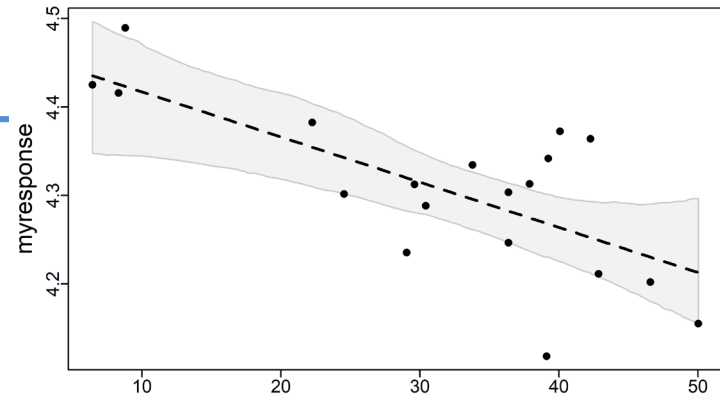
➤ **Caihong Fu** from DFO, Canada

- ✓ *INDISEAS 1 (2005-2009)* as a case, and introduce its objective, strategy, as well as the **main lessons, key questions, and insights** from IndiSeas;
- ✓ making Ecological Indicators Management Ready: Assessing their ability to detect impacts of fishing and environmental change”, introduced **gradient forest method**;
- ✓ **Responses of ecological indicators to fishing under environmental change: Linear or nonlinear?**”. Took 10 individual ecosystems as cases, and choose 14 indicators;

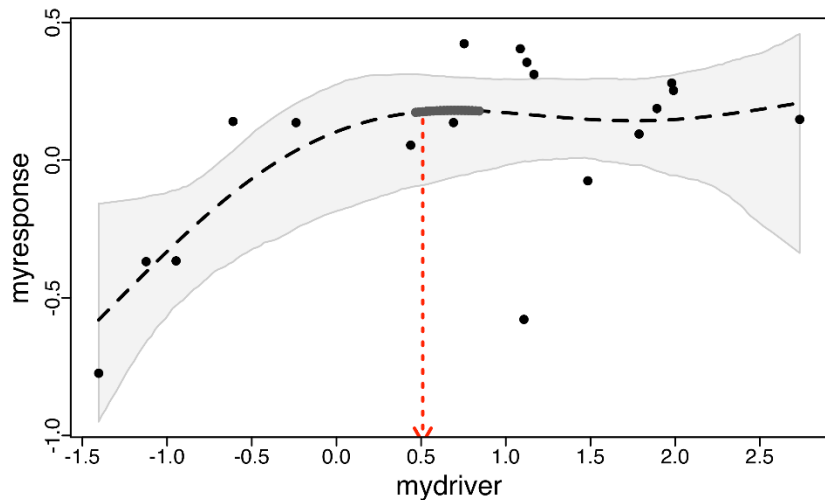




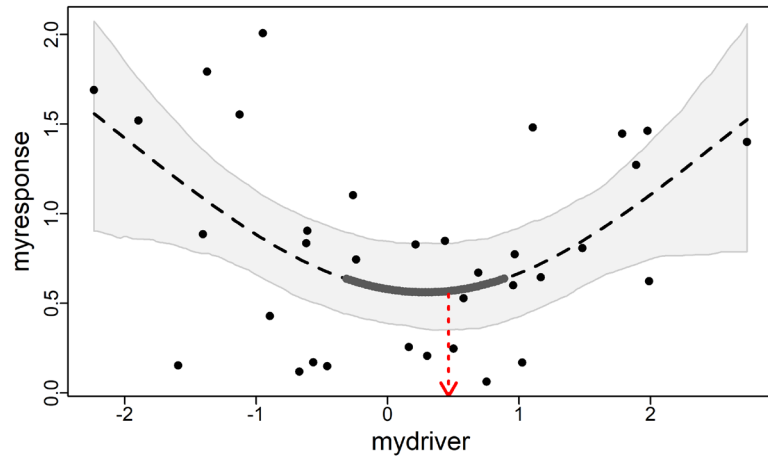
Effect of catch mostly in Primorye (Region 19) without lags on MTI



Effect of catch mostly in Primorye (Region 19) on MTI after 3 years



California current
Northern copepods



China coastal waters
Shellfish landings

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- 1-day business meeting at the 2018 annual PICES meeting



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Ongoing and planned activities:

- Joint PICES/ICES intersessional workshop on “**Identifying the existence of thresholds in marine ecosystem driver-response relationships**”
- 1-day topic session on “**Identifying thresholds and potential leading indicators of ecosystem change: the role of ecosystem indicators in ecosystem-based management**” at the 2019 PICES annual meeting;
- 1-day business meeting at the 2019 annual PICES meeting;
- The practical workshop on **Common Ecosystem Reference Points** during the 2019 PICES annual meeting;

Thank you

ありがとうございました

谢谢

спасибо

고맙습니다!