WG-36: Common Ecosystem Reference Points (CERP)

2018 PICES Annual Meeting
Yokohama, Japan
WG-36 Report to FUTURE

- SG-EBM 2003
- WG-EBM 2004-9
- SG-CERP 2016
- WG-28 2011-15
- WG-CEP 2017-19
- WG-NPESR 2017-19
- S-CCME 2015-20

Collaboration:
Indicators
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?
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- **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
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**

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

S6 FUTURE Session Oct 31, 2018 Yokohama, Japan
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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!