

2022 Report of the Fishery Science Committee

The meetings of the Fishery Science Committee (FIS) were held on Sunday, Tuesday, September 14, 09:00–12:00 and Wednesday, September 15, 09:00–12:00 prior to PICES-2022 in Busan, Korea. FIS Chair Dr. Xianshi Jin called the meeting to order and welcomed members and observers (*FIS Endnote 1*). Dr. Siroh Yonezaki (Japan) replaces Dr. Tetsuo Fujii. Dr. Jessica Miller is a new member representing the USA. The draft agenda was reviewed by the participants and was adopted without revisions (*FIS Endnote 2*). Dr. Jackie King was appointed rapporteur.

AGENDA ITEM 3

Proposed Joint PICES-Pacific Salmon Commission Study Group on Scientific Cooperation in the North Pacific Ocean

- a. Overview of “Framework for Enhanced Cooperation in the North Pacific Ocean between the Pacific Salmon Commission (PSC) and the North Pacific Marine Science Organization (PICES)” (Jackie King)
- b. Discussion and recommendations on the Framework

FIS members wondered about potential overlap between NPAFC and PSC, given that PICES already has a Memorandum of Understanding with NPAFC. The PSC focus is on coastal waters and stock assessment; NPAFC focus is on high seas, with no stock assessment. Having a PICES–PSC Memorandum of Understanding will help to enrich the PICES–NPAFC collaboration, and *vice versa*, and will fill a gap in Pacific salmon research.

Recommendation to SB: FIS recommends that Science Board approve the Framework.

AGENDA ITEM 4

Report on FUTURE science program

Dr. Sukyung Kang reported on FUTURE SSC plans for a peer-reviewed manuscript outlining PICES’ accomplishments in FUTURE and identifying where gaps in marine science still remain. The planned FUTURE Open Science Meeting has been delayed several times due to COVID, at this stage instead of a OSM, there will be plenary workshop at PICES-2024 with a theme of “FUTURE of PICES Science’ along with a workshop to strategize the next phase of PICES flagship science. The FUTURE SSC recognizes that there should be integration of FUTURE to UNDOS-relevant activities, and these strategy sessions will consider how to refocus FUTURE Phase III, engage ECOPs and maintain an integrated Science Program. FUTURE is sponsoring 4 workshops at the upcoming 2022 Annual Meeting (W3, W4, W8, W10) and four Topic Sessions (S2, S3, S6 and S7). Dr. Kang will no longer serve as FIS Committee liaison to FUTURE.

AGENDA ITEM 5

Other organizations

a. North Pacific Fisheries Commission (Alex Zavolokin)

Joint activities with PICES in 2021–2022 included NPFC participation in WG 43 on *Small Pelagic Fish*. The NPFC is co-sponsoring the PICES-ICES-FAO Small Pelagic Fish Symposium and representatives will attend. At PICES-2022, S5 (Topic Session on “*Environmental variability and small pelagic fishes in the North Pacific: exploring mechanistic and pragmatic methods for integrating ecosystem considerations into assessment and management*” is co-sponsored by NPFC. There are no PICES-NPFC proposals for PICES-2023.

b. International Pacific Halibut Commission (Josep Planas)

Next year will be the centennial celebration of IPHC, established in 1923. The IPHC would like PICES involvement in IPHC Centennial Year Celebration; plans are currently in the works and the IPHC will be reaching out to PICES' Secretariat at a later date. The IPHC is a co-sponsor of W5 (Workshop on “*Integrating biological research, fisheries science and management of broadly distributed flatfish species across the North Pacific Ocean in the face of climate and environmental variability*”) at PICES-2022. The IPHC is proposing a workshop for the 2023 PICES Annual Meeting on “*Integrating biological research, fisheries science and management of flatfish species in the North Pacific Ocean in the face of climate and environmental variability*”. This proposal continues from the 2022 workshop, with a focus on movement and potential distribution changes. Anticipating a Special Issue publication from PICES' 2019 workshop in *Fisheries Research*, there are only a few remaining papers with revisions to complete. This publication does not require financial support from PICES.

Recommendation to SB: FIS recommends the 1-day Workshop for PICES-2023 on “*Integrating biological research, fisheries science and management of flatfish species in the North Pacific Ocean in the face of climate and environmental variability*”

c. North Pacific Anadromous Fish Commission (Vladimir Radchenko)

In 2022, five expedition vessels from Canada, Russia and the United States conducted an integrated trawl survey to study Pacific salmon distribution and winter ecology in the North Pacific during February–April. Preliminary expedition results will be presented at the upcoming International Year of the Salmon (IYS) Workshop (October 2–3). NPAFC is sponsoring the IYS Symposium on “*Salmon in a Rapidly Changing World*” October 4–6, in Vancouver. There will be 200+ attendees, four theme sessions and plenary session, 50+ oral presentations, with three pre-symposium workshops on pink salmon, IYS Expedition results, and Indigenous knowledge. NPAFC is working with partners to develop a UNDOCS Project, “Basin Scale Events to Coastal Impacts” (BECI) – see Agenda Item 8. The 2022 NPAFC Annual Meeting was postponed and the 30th Annual Meeting will be Busan, Korea May 15–19, 2023. NPAFC does not have any Topic Session or Workshop proposals for PICES-2023; focus will be on launching BECI if Science Board/Governing Council approves at the 2022 Annual Meeting.

AGENDA ITEM 6

FIS Action Plan

The Action Plan requires updating; members propose to accomplish this by 2023 Inter-session Science Board Meeting (ISB-23, April/May 2023) – volunteers will work *via* email if required.

FIS reviewed its current Action Plan (2012–2015) and noted that it is aligned well with the current Strategic Plan, and that it remains very relevant to the goals and priorities of FIS. It was noted that the current Action Plan has many specific tasks, which provide too much detail and are not truly required. Since the FIS Committee Action Plan is already aligned with the overall PICES Strategic Plan, FIS will provide only minor edits with the retention of the main Goals and Activities, but to remove specific tasks. This will serve as the Action Plan from 2016 onwards, until a new PICES Strategic Plan is established.

Recommendation to SB: FIS recommends that Science Board approve its revised Action Plan.

AGENDA ITEM 7

Reports of FIS-sponsored Expert Groups

a. S-CCME: Joint PICES/ICES Section on Climate Change Effects on Marine Ecosystems (K. Holsman)

S-CCME held its annual meeting held last week virtually. S-CCME is now in Phase IV of its Implementation Plan. An outstanding request is a new Canadian delegate to replace Dr. Jackie King, who

stepped down as S-CCME member. Activities and Achievements are outlined in *S-CCME Endnote 3a*. S-CCME has proposed multiple sessions and workshops at ECCWO5. S-CCME members are leads (SUPREME) or members (SmartNet, Fish SCORE, IPOD) of multiple ocean decade programs. S-CCME will hold a 0.5 day virtual business meeting for PICES-2023, but will require assistance from the Secretariat in hosting a Zoom meeting. S-CCME requests a 1-day in-person meeting at PICES-2023 to gain momentum lost due to two years of virtual meetings. This 1-day in-person meeting would support discussions and scoping of topics such as: Blue Carbon, participatory science, SUPREME. S-CCME has proposed a 1-day Workshop on “*Towards climate-informed ecosystem-based fisheries management*” for the 2023 Annual Meeting.

Recommendation to SB: FIS recommends that Science Board requests Canada name a new member for the replacement of Dr. Jackie King.

Request to SB: FIS requests that the PICES Secretariat assist S-CCME in hosting a Zoom meeting in 2023 for their 0.5 day business meeting

Recommendation to SB: FIS recommends to Science Board that S-CCME be allocated a 1-day meeting at PICES-2023 in order to gain momentum lost due to two years of virtual meetings. This 1-day in-person meeting would support discussions and scoping of topics such as: Blue Carbon, participatory science, SUPREME.

Recommendation to SB: FIS recommends the 1-day Workshop on “*Towards climate-informed ecosystem-based fisheries management*” for the 2023 Annual Meeting.

b. Working Group 43: Joint PICES/ICES Working Group on Small Pelagic Fish (A. Takasuka)

WG 43 activities this past year (*S-CCME Endnote 3b*) has focused around preparing for the upcoming November 7–11, 2022 International Symposium in Lisbon, Portugal “*Small Pelagic Fish: New frontiers in Science and sustainable management*”. There are 368 registrants from 51 countries, with 312 abstracts for 6 Workshops and 7 Topic Sessions. Special issues are to be published in *Marine Ecological Progress Series* and *Canadian Journal of Fisheries and Aquatic Sciences*. WG 43 has requested a 1-day Topic Session on “*Responses of small pelagic fish to extreme events in Pacific ecosystems*” for the 2023 Annual Meeting. FIS notes that the intended outcome of this Topic Session is different from the other Topic Session proposed on small pelagic fish and it would not be beneficial to combine these two session proposals.

Recommendation to SB: FIS recommends the 1-day Topic Session on “*Responses of small pelagic fish to extreme events in Pacific ecosystems*” for PICES-2023. FIS notes that the intended outcome of this Topic Session is different from the other Topic Session proposed on small pelagic fish, and FIS does not support combining these two session proposals.

c. Working Group 44: Joint PICES/ICES Working Group on Integrated Ecosystem Assessment for the Northern Bering Sea - Chukchi Sea (NBS-CS) (discussion by FIS Members – no presentation).

WG 44 has been delayed in achieving its TOR because membership was delayed by 1 year. WG 44 has achieved Year 2 activities of its TOR (*S-CCME Endnote 3c*) and requests a 1-year extension to accomplish remaining TOR. FIS accepts the Work Plan for 2022–2023 (see [WG 44 report](#)) and recommends to Science Board a 1-year extension for WG 44. FIS recommends that Science Board consider the questions raised by WG 44 on the Advisory Panel on the Arctic Ocean and the Pacific Gateways (AP-ARC) proposal before approving it: What is the special reason for forming this new AP? What will be the advice provided by the AP? Will Arctic science be a concern for other committees or other expert groups?

Recommendation to SB: FIS advises Science Board to consider the questions raised by WG 44 when considering the AP-ARC proposal, specifically: What is the special reason for forming this new AP? What will be the advice provided by the AP? Will Arctic science be a concern for other committees or other expert groups?

Recommendation to SB: FIS recommends that Science Board accepts the Work Plan submitted for 2022–2023 and that a 1-year extension (2022–2023) be approved for WG 44.

d. Working Group 45: Joint PICES/ICES Working Group on Impacts of Warming on Growth Rates and Fisheries Yields (GRAFY) (Shin-ichi Ito)

WG 45 is on track to meet its TOR within its expected duration. Major achievements include the application and refinement of 3 models, all available as open source on GitHub (*S-CCME Endnote 3d*). WG 45 has a proposal for a Topic Session at PICES-2023, and requests partial travel support for two invited speakers (\$3,000 each), from the UK and Australia.

Recommendation to SB: FIS recommends the 1 day Topic Session on “*Understanding the implications of body size change for stock productivity and fisheries management*” for PICES-2023. FIS requests partial travel support for 2 invited speakers for \$3,000 each (\$6,000 in total).

AGENDA ITEM 8

UNDOS project on Basin-Scale Events to Coastal Impacts

BECI UNDOS Science Program proposal by PICES, NPAFC, DFO and Long Live the Kings: Four sets of workshops were held in 2022 to develop the proposal and inform the Science Plan. Salmon will be an exemplar species while a modular approach will include all species of interest, *e.g.*, Pacific saury and tunas. The Science Plan will likely include components: modeling and prediction; real-time monitoring and reporting; data mobilization and synthesis; targeted at-sea research; dialogue/communication/outreach. The next stage will be engaging scientists to write a Science Plan. There is ongoing development of BECI Science Plan and outreach to potential partners and donors. The Program will run through 2030.

Basin-scale linkages to coastal ecosystems is an important area for PICES research, and FIS looks forward to receiving the Science Plan to see how it fully meets the need of PICES. There has been active outreach to the Japan Fisheries Agency, and to Korea and China to develop western Pacific engagement.

AGENDA ITEM 9

Recommendations on proposals to Science Board

a. Proposed 2023 Annual Meeting Topic Sessions and Workshops

FIS provided priority rankings for 12 Topic Session and 11 Workshop proposals: not a priority to FIS; low, medium and high priority. Four proposals were ranked with a high priority for FIS, and recommended for acceptance.

FIS notes that the intended outcome of the WG 43 Topic Session is different from the other Topic Session proposed on small pelagic fish, and it would not be beneficial to combine these two Topic Session proposals.

FIS notes that the Workshop on “*Nurturing future generation in fisheries and marine environment science: Collaboration with PICES and Asia Fisheries and Marine Environment Leaders Program (AFIMA Leaders Program)*” is not well described, and no ranking was provided. This proposal requires more information aside from introduction of AFIMA Leaders Program.

Recommendation to SB: acceptance of:

- Topic Session on “*Responses of small pelagic fish to extreme events in Pacific ecosystems*” for WG 43;
- Topic Session on “*Understanding the implications of body size change for stock productivity and fisheries management*” for WG 45;
- Workshop on “*Towards climate-informed ecosystem-based fisheries management*” for S-CCME
- Workshop on “*Integrating biological research, fisheries science and management of flatfish species in the North Pacific Ocean in the face of climate and environmental variability*” for IPHC and FIS

b. Proposed expert groups

There were no proposed expert groups.

c. Requested financial assistance or sponsorship from other organizations.

There were no requests for financial assistance or sponsorship.

AGENDA ITEM 10

Early Career Scientist Award for Best Presentation

Drs. Chris Rooper and Jessica Miller will judge oral and poster presentations in S5; Steve Lindley will judge oral and poster presentations in S7 (BIO/FIS/POC/FUTURE/HD Topic Session on “*Forecasting and projecting climate variability and change on northern hemisphere marine ecosystems using coupled next generation biophysical model*”); Drs. Steve Lindley and Sukyung Kang will judge oral and poster presentations in the FIS Contributed Paper Session (FIS-P) and Chris Rooper will judge oral and poster presentations in W5 (FIS Workshop on “*Integrating biological research, fisheries science and management of broadly distributed flatfish species across the North Pacific Ocean in the face of climate and environmental variability*”). Judges will meet at the Poster Session, Thursday night, to compare ECOP candidates and select best overall FIS Oral and Poster ECOP Awards, which will be confirmed by Drs. Lindley and Kang after the FIS-P oral presentations on Friday. Dr. Lindley will present the awards on behalf of Chair Jin at the Closing Ceremony.

AGENDA ITEM 10

Other business

There was no other business.

FIS Endnote 1

FIS participation list

Members

Xianshi Jin (China, Chair)
Jackie King (Canada, Vice-Chair)
Xiujuan Shan (China) [Day 1]
Nobuaki Suzuki (Japan)
Sukgeun Jung (Korea)
Sukyung Kang (Korea)
Mikhail A. Stepanenko (Russia)
Steve Lindley (USA)
Jessica Adele Miller (USA)

Observers

Oleg Katugin (Russia)
Catherine Michielsens (PSC)
Josef Planas (IPHC)
Vladimir Radchenko (NPAFC)
Alex Zavolokin (NPFC)
Kirstin Holsman (USA, S-CCME Co-Chair)
Akinori Takasuka (Japan, WG 43 Co-Chair)
Shin-ichi Ito (Japan, WG 45 Co-Chair)
Paul Spencer (USA, WG 45 Co-Chair)

Members unable to attend

Canada: Chris Rooper
China: Zhuojun Ma
Korea: Heewon Park
Russia: Elena P. Dulepova, Alexander I. Glubokov
USA: Elizabeth A. Logerwell

PICES

Sonia Batten (Executive Secretary)
Robin Brown (Past Executive Secretary)
Sanae Chiba (Deputy Executive Secretary)

FIS Endnote 2

FIS meeting agenda

Tuesday, September 14, 09:00–12:00

1. Welcome and changes to FIS membership
2. Adoption of agenda
3. Proposed Joint PICES-Pacific Salmon Commission Study Group on Scientific Cooperation in the North Pacific Ocean
4. Report on FUTURE science program
5. Other organizations

Wednesday, September 15, 09:00–12:00

6. FIS Action Plan
7. Reports of FIS-sponsored expert groups
8. UNDOS project on Basin-Scale Events to Coastal Impacts
9. Recommendations on proposals to Science Board
10. Early Career Scientist Award for Best Presentation (Oral or Poster)
11. Other business

FIS Endnote 3

a. 2022 Annual Report of S-CCME

EG name	S-CCME: Climate Change Effects on Marine Ecosystems
Chair name(s)	Drs. Kirstin Holsman (S-CCME), Xiujuan Shan (S-CCME), Kathy Mills (SICCME), Alan Baudron (SICCME)
Date of group meeting after ISB 2022 (April)	Sept. 8, 2022 (PDT)

1. Achievement

Activities and Achievements		TOR No. to address
1	<ul style="list-style-type: none"> IPCC AR6 WKII report was finalized and released to the public early in 2022. S-CCME members Drs. Ito and Holsman were co-authors. K Mills (SICCME co-chair) and K Holsman (S-CCME co-chair) are authors on the 'Oceans and Marine Resources' chapter of the 5th US National Climate Assessment, which will be finalized in fall 2023. 	TOR 2 & TOR 3
2	<p>S-CCME members proposed multiple sessions and workshops at ECCWO5:</p> <ul style="list-style-type: none"> K Holsman (S-CCME co-chair), K Mills (SICCME co-chair) and Elliott Hazen (SICCME) will convene a workshop on integrated modeling to identify climate change tipping points in marine ecosystems K Mills (SICCME co-chair) is one of the conveners for a session on responses of marine social-ecological systems to climate extremes. K Holsman (S-CCME co-chair), Steven Bogard (S-CCME), and Phoebe Woodworth-Jefcoats (S-CCME) will help convene a session on advances in coupling regional climate and social-ecological models to improve climate-ready ecosystem management. Alan Haynie (S-CCME) is a convener of a session on coupling social science and economics in integrated marine climate modeling. F. Mueter (S-CCME) Co-convener of session on 'Cumulative anthropogenic impacts on key Arctic species' Manuel Hidalgo ,Rebecca G. Asch,Lorenzo Ciannelli, Shin-ichi Ito,Lauren Rogers will convene "S10: Beyond species on the move: emerging climate change impacts on the spatial dynamics of marine species, from detecting to forecasting and projecting" 	Tor 1
3	<p>S-CCME members are leads or members of multiple ocean decade programs; S-CCME is lead support for SUPREME</p> <ul style="list-style-type: none"> 5+ UNDOS were discussed and coordination initiated during the 2022 meeting 	Tor 1-4

TOR which are addressed

<p>TOR 1. Define, coordinate and integrate the research activities needed to understand, assess and project climate change impacts on marine ecosystems;</p> <p>TOR 2. Plan strategies for sustaining the delivery of ecosystem goods and services, and when possible predictions should include quantifying estimations of uncertainty;</p> <p>TOR 3 Define and quantify the vulnerability and sustainability of marine ecosystems to climate change, including the cumulative impacts and synergetic effects of climate and marine resource use;</p> <p>TOR 4. Build global ocean prediction frameworks, through international collaborations and research, building on ICES and PICES monitoring programs.</p>

Is your EG on track to meet your objectives before the end of your term?

 X Yes

2. Publication

A. PICES Publication (report BEFORE published) <i>PICES Science/Technical Report (example), Journal Special Issue (example)</i>	
Required process	Recommended by SB => Approved by Governing Council => Posted on PICES website when published
What to submit	A copy of “ manuscript ” to reporting Parent Committee and Secretariat
	(note)
B. Products of collaboration with other organizations (report AFTER published) <i>Booklet/Report published by collaboration with other organizations, e.g. IOC, SCOR (example)</i>	
Required process	Acknowledged by SB then Governing Council => Posted on PICES website
What to submit	A copy of the “ product ” to reporting Parent Committee and Secretariat
(citation)	(note)
D. Peer-reviewed Journal Paper (report AFTER published)	
Required process	Acknowledged by SB then Governing Council => Posted on PICES website
What to submit	A copy of the “ PDF ” reprint or “ DOI ” to reporting Parent Committee and Secretariat
IPCC AR6 WKII : Climate Change 2022: Impacts, Adaptation and Vulnerability https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_FullReport.pdf	Authors include Drs. Shin-ichi Ito & K. Holsman with multiple cited contributions from PICES members.

3. Requests for SB Recommendation

3.2. Membership needs

Country	Name and organization	e-mail	Basis of the need (generation/gender balance, additional members from a specific country, etc.)
Canada	(if identified)	(if identified)	Additional member to replace membership previously held by J. King departure.

3.3. Proposal for co-sponsored Capacity Building events

Event title/type	Date	Location	Amount and rationale of fund requested
<ul style="list-style-type: none"> • ½ day S-CCME business meeting at PICES 2023 • + 1 full day open S-CCME meeting at PICES 2023 to support discussions and workshop around topics such as: Blue Carbon, participatory science, SUPREME 	Along with the 2023 PICES Annual Science Meeting	Seattle, WA	(CA\$) If possible, travel or hotel for an invited speaker/participant (~\$3,000). [The meetings can still take place without travel support]

b. 2022 Annual Report of WG 43: Small Pelagic Fish

EG name	WG 43: Joint PICES/ICES Working Group on Small Pelagic Fish
Chair name(s)	Ryan Rykaczewski (USA) and Akinori Takasuka (Japan)
Date of group meeting after ISB 2022 (April)	Various sub-group meetings with ICES members. No PICES-only meetings. Business meeting: scheduled as September 19 (Monday) HST, PDT / September 20 (Tuesday) JST

1. Achievement

Activities and Achievements		TOR No. to address
1	Preparation for the joint ICES/PICES symposium on “Small Pelagic Fish: New Frontiers in Science and Sustainable Management” (November 7-11, 2022, Lisbon Portugal) and the post-symposium meeting (November 12-13, 2022, Lisbon, Portugal). The symposium includes Plenary Sessions, 7 Topic Sessions, Poster Session, 6 Workshops, Early Career Scientist Mentoring Event. The symposium has received a total of 312 abstracts and 367 registrations as of the early Sep. The post-symposium meeting is intended to summarize the symposium, expand the network, and identify key issues to achieve the TORs. Special issues are expected to be published in Marine Ecology Progress Series and Canadian Journal of Fisheries and Aquatic Science.	5
2	Through the processes of preparation for the symposium/meeting, the WG has been expanding a networking environment for international and multidisciplinary collaboration and identifying, prioritizing, and coordinating research most needed to advance our knowledge and understanding the environments, biology, and management of small pelagic fish.	2, 3
3	Discussed the potential pole of small pelagic populations as components of the ecosystem that mediate the influence of climate extreme events on the socioeconomics of coastal communities. Propose a PICES 2023 session topic with WG-49.	3

TOR which are addressed

2.	Create a networking environment for international and multidisciplinary collaboration to foster the establishment of similar study frameworks and comparative analyses of SPF across different social-ecological systems based on updated time-series data sets of climate indices, environmental factors and tipping points, fisheries biology and ecophysiological information (feeding, growth and survival), and inter-model comparisons.
3.	Identify, prioritize, and coordinate research most needed to advance our knowledge and capacity to predict the population dynamics of SPF at both short (seasonal to inter-annual) and long (decadal to centennial) time scales.
5.	Organize a joint ICES/PICES symposium on SPF, tentatively scheduled for late 2021, that builds upon the 2017 symposium in Victoria, Canada, and showcases integrative analyses of this working group. Additionally, working group members will propose, coordinate, and convene topic sessions at PICES Annual Meetings and ICES Annual Science Conferences focused on key questions and recent advances in SPF science.

Is your EG on track to meet your objectives before the end of your term?

_X_Yes**3. Requests for SB Recommendation****3.7 Any other Request for SB Recommendation**

We request a half-day business meeting at the 2023 PICES Annual Meeting.

4. Any Other Issues to Discuss at SB

WG 43 is a joint working group (with ICES WG-SPF). The two groups will be meeting jointly in mid-November following the International Symposium on Small Pelagic Fish. The joint working group plans to organize special issues of journals that will emerge as a result of the symposium, including editorials led by members of the working group.

Members of PICES WG 43 and WG 49 discussed a potential joint topic session (for the 2023 Annual Meeting) that focuses on the sensitivity of small pelagic fish populations to extreme events and the consequences to coastal communities.

c. 2022 Annual Report of WG 44: IEA of Northern Bering and Chukchi Seas

EG name	WG44 IEA Northern Bering-Chukchi seas
Chair name(s)	Logerwell and Zuenko
Date of group meeting after ISB 2022 (April)	August 31, 2022

1. Achievement

Activities and Achievements		TOR No. to address
1	Developed three conceptual models with a team of interdisciplinary and multi-national scientists with input from Indigenous representatives	Year 2 Activities
2	“Multiple Ways of Knowing the Bering Sea-Chukchi Sea Ecosystem” workshop. Workshop organizers are in the process of transcribing the workshop notes and summarizing the ideas for bringing in Indigenous knowledge into our IEA process	Year 2 Activities
3		

TOR which are addressed

<p>Year 2 Activities</p> <ul style="list-style-type: none"> ● Describe the key physical, biological and human elements of the ecosystem ● Develop shared conceptual models including both Indigenous Knowledge and science; and review of hypotheses for ecosystem dynamics ● Conduct a PICES workshop to discuss and describe the objectives & values

Is your EG on track to meet your objectives before the end of your term?

No: The WG started late due to delays in establishing membership. In addition, the WG has been functioning under the restrictions and difficulties related to the COVID-19 pandemic.

3. Requests for SB Recommendation

3.1. Proposal for new Expert Groups

Name of EG	Chair(s) & e-mail	Proposed Parent Committee	Note
AP-ARC	Alison Deary (USA) (Ali.Deary@noaa.gov), Sarah Wise (WG44, USA; TBC) (Sarah.Wise@noaa.gov ; Sei-Ichi Saitoh (WG39) (Japan) - ssaitoh@arc.hokudai.ac.jp Hyoung Chul Shin (WG39) (Korea) - hcshin@kopri.re.kr	SB	<p>WG44 has several questions that need to be addressed before we can recommend this new AP. What is the special reason for forming this new AP? What will be the advice provided by the AP? Will Arctic science be a concern for other committees or other EGs? Also, please note that WG44 will ask for an extension of our term.</p> <p>Despite these questions, we feel that this is an opportunity for ICES-PICES collaboration in the region between the two convention areas. But it also seems the Secretariats (Sonia and Alan Haynie) will have more insight as to whether an Advisory Panel is the best approach to advise within each institution (PICES/ICES) on Arctic issues and also the best mechanism to help coordinate between them in a region of common interest.</p>

3.6. Change of Chairs and Revision of Term, TOR, Action Plan etc.

Does your EG change/revise any of these?			
Chair	No	(if yes) Name of chair who steps down: Name, country, contact of new chair:	(note)
Extension of Term	Yes	(If yes) <ul style="list-style-type: none"> • 1 year 	The WG started late due to delays in establishing membership. In addition, the WG has been functioning under the restrictions and difficulties related to the COVID-19 pandemic. We have developed a

			Work Plan that accomplishes Years 1 and 2 Activities and Deliverables as detailed in our ToR. A one-year extension will be requested to complete Year 3 Activities and Deliverables in our ToR.
TOR	No	(if yes) Please submit the revised TOR and clarify the points of changes.	(note)
Action or Implementation Plan	Yes	(if yes) Please submit the revised Plan and clarify the points of changes.	See WG44 Work Plan 2023.docx

d. 2022 Annual Report of WG 45: Impacts of Warming on Growth Rates and Fisheries Yields

EG name	Joint ICES/PICES Working Group on Impacts of Warming on Growth Rates and Fisheries Yields
Chair name(s)	Dr. Paul Spencer and Prof. Shin-ichi Ito
Date of group meeting after ISB 2022 (April)	ToR subgroup meetings have occurred since the ISB 2022 meeting, including on April 28 (ToR 1) and July 6 (ToR 1)

1. Achievement

Activities and Achievements		TOR No. to address
1	The <i>Sarla</i> model (a state-space statistical model for fish length-at-age, written in the <i>Stan</i> language and packaged in the R package <i>Sarla</i>) has been further developed and applied to length-at-age data from the California Current. This work will be presented at the 2022 ICES Annual Science Conference	ToR 1
2	Work has been initiated on simulation modeling of the dynamics of fish size-at-age using two modeling packages: <i>ss3sim</i> (a large and commonly used program for stock assessment), and <i>ProDynR</i> (a independent program for conducting projections of fish recruitment, abundance, and growth). Additionally, a set of simulation scenarios have been identified, focusing on simulating either the temperature-size rule or constant growth, and simulating a range of sampling effort. These simulations will allow evaluation of various statistical estimation models for detecting the influence of temperature on fish size-at-age.	ToR 1
3	Age-specific weight data for 17 (6) populations of 13 (4) fish species around Japan were compiled from 1995 (1978) to 2018. Dynamic factor analysis revealed the common trends of fish weight, which mainly be influenced by prey zooplankton decrease accompanied by North Pacific Gyre Oscillation (intra/inter-specific density effects). This work will be presented at the 2022 ICES Annual Science Conference.	ToR 2 & 4

- 1) Assess the capacity of statistical models to incorporate temperature-dependency of growth, and compare their predictions of growth variation across specific warming scenarios and locations.
- 2) Analyze long-term growth patterns across multiple large marine ecosystems that are experiencing different trends in temperature, including the direct comparison of empirical length at age data for specific species across their range, and the application of a common modelling approach.
- 4) Identify options for expanding scientific community access to global length-at-age data that are routinely collected by fisheries agencies worldwide.

Is your EG on track to meet your objectives before the end of your term?

_X_Other: (Please explain) : We are trying best to advance our activity with holding series of virtual meetings. We are thinking WG-GRAFY EG is making good progress within limitation of direct communication.

3. Requests for SB Recommendation

3.6. Change of Chairs and Revision of Term, TOR, Action Plan etc.

Does your EG change/revise any of these?			
Chair	No	(if yes) Name of chair who steps down: Name, country, contact of new chair:	(note)
Extension of Term	No	(If yes) How long do you need to extend? <ul style="list-style-type: none"> • <u>WG & SG</u>: 6 months, 1 year or other duration(specify)? • <u>Section</u>: how many years? 	(note)
TOR	No	(if yes) Please submit the revised TOR and clarify the points of changes.	(note)
Action or Implementation Plan	No	(if yes) Please submit the revised Plan and clarify the points of changes.	(note)

3.7 Any other Request for SB Recommendation

A half day business meeting at PICES 2023.

One day Topic Session on “*Understanding the implications of body size change for stock productivity and fisheries management*” at PICES-2023 and travel support of 2 invited speakers.