

**The Asia Pacific Network-North Pacific Marine Science Organisation (PICES) Collaborative Framework
for Scientific Cooperation**

The Collaborative Framework for Scientific Cooperation between the APN and PICES comes into effect when signed below by both parties, and will continue for a period of five years at which time it will be reviewed to assess progress.

The Collaborative Framework may be revised at any point as agreed by both parties, and may be renewed for a further period if approved by both the PICES Science Board and APN Steering Committee.



Signature

17 February 2023
Date

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APN-PICES Collaborative Framework for Scientific Cooperation

Executive Summary

The Asia-Pacific Network for Global Change Research (APN) and North Pacific Marine Science Organization (PICES) are Intergovernmental Organizations with shared goals, particularly in terms of supporting international cooperation in research and capacity development, and partly overlapping geographic regions of focus. The joint APN-PICES Study Group for Scientific Cooperation in the Pacific Ocean (SG-PICES-APN) developed a framework that strives to enhance collaboration between the two organizations. This collaborative framework identifies several broad areas of joint interest to PICES and APN on which progress could be made over the next five years. Research areas relating to climate change (for example; sustainable fisheries, ecosystem services and food security, impacts of extreme events on coastal communities and the need for adaptation and disaster risk reduction) as well as marine plastic debris and microplastics, and downscaling of regional climate models are current foci for both organizations. Two common types of activity that spanned these research areas were also identified, one being the capacity development of early career professionals and the second being the engagement of Local and Traditional Ecological Knowledge (LTEK), a cross-cutting theme for the climate change research areas, in particular.

The framework identifies various mechanisms for implementing enhanced collaboration between PICES and APN including workshops and joint working groups, topic sessions at PICES Annual Meetings, representation at each other's meetings and/or workshops. As areas of interest and priorities change over time, the joint areas for collaboration may be updated.

Following approval from both organizations, routine monitoring of the progress of activities will be completed jointly by the Secretariats of PICES and APN and reported to the PICES Science Board annually, and APN's Intergovernmental Meeting (IGM) and Steering Committee (SC) on a regular basis, respectively.

Background

The Asia-Pacific Network for Global Change Research (APN) and North Pacific Marine Science Organization (PICES) are Intergovernmental Organizations with shared goals, particularly in terms of supporting international cooperation in research and capacity development, and partly overlapping geographic regions of focus.

APN was established in 1996 as an intergovernmental network working towards an Asia-Pacific region that is successfully addressing the challenges of global change and sustainability. A list of the member countries of APN can be found [here](#).

APN's mission is to support a cohesive and interactive community of global change researchers, policymakers, practitioners and civil society across the Asia-Pacific region through innovative and transdisciplinary approaches that draw upon the extensive network of science-policy practitioners. An integral part of its mission is to support and promote the scientific investigations of changes in the Earth's life support systems and their implications for sustainable development in the Asia-Pacific region. The APN contributes to the realization of these investigations through:

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1. Supporting research and science-based response strategies.
2. Effectively linking scientific outcomes with policy mechanisms applicable to all levels of governance and societal sectors in each country.
3. Scientific capacity development within and beyond governments, including affected communities and other members of civil society.

PICES was established in 1992 to:

- I. promote and coordinate marine scientific research in order to advance scientific knowledge of the area concerned and of its living resources, including but not necessarily limited to research with respect to the ocean environment and its interactions with land and atmosphere, its role in and response to global weather and climate change, its flora, fauna and ecosystems, its uses and resources, and impacts upon it from human activities;
- II. promote the collection and exchange of information and data related to marine scientific research in the area concerned.

The Organization receives recommendations on the science program from the Science Board Executive Committee, which is supported by a number of permanent scientific and technical committees, along with an assemblage of “expert groups” with various life-spans. The PICES Convention Area is defined as “the temperate and sub-Arctic region of the North Pacific Ocean and its adjacent seas, especially northward from 30 degrees North Latitude, hereinafter referred to as the “area concerned”. Activities of the Organization, for scientific reasons, may extend farther southward in the North Pacific Ocean.”

The present PICES members are Canada, Japan, People’s Republic of China, Republic of Korea, the Russian Federation, and the United States of America. All PICES countries, except Canada, are currently also members of APN.

Development of Collaboration

Reciprocal participation in annual meetings of both organizations in 2020 prompted the recognition of shared priorities and that closer ties, and planning of joint activities, would be mutually beneficial. A joint Study Group (SG) to develop a Framework for Scientific Cooperation was developed and approved by PICES Governing Council in 2021 [GC Decision 2021/S/3] with a Terms of Reference that can be found here: [study-groups - PICES - North Pacific Marine Science Organization](#). Identification and approval of members was hampered by the COVID-19 pandemic, which prevented any in-person meetings and took some time, however, the Study Group had its first online meeting in February 2022. The SG met virtually three more times through 2022 and corresponded online to draft the present Collaborative Framework which was presented to PICES Science Board and Governing Council at PICES-2022. Representatives of both organizations also met in-person at PICES-2022 to discuss next steps. The present Collaborative Framework will be presented for consideration and approval to the APN Steering Committee either via email or on the occasion of its 51st Meeting in early 2023.

Collaborative Framework

APN Science Priorities

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Through support of regional and international cooperation in research on inter- and transdisciplinary global change and sustainability issues particularly relevant to the Asia-Pacific region, APN aims to produce policy-relevant scientific knowledge that can contribute to the implementation of international agendas, such as the UNFCCC's Paris Agreement, Sustainable Development Goals, Sendai Framework for Disaster Risk Reduction, Post-2020 Global Biodiversity Framework, UN Decade of Ocean Science (2021-2030), and the accumulation of scientific knowledge in science-policy assessment bodies such as IPCC, IPBES, etc.

Global change affects all countries, and its impacts and the ability to measure and understand these impacts intersects different disciplines. Therefore, APN strives to address global change and sustainability in a holistic manner that involves active participation of all member countries across a broad spectrum of thematic areas under the global environmental change umbrella, including:

- Climate;
- Biodiversity and ecosystems;
- Air, land, coasts and oceans;
- Food, water and energy;
- Risk and resilience; and
- Human dimensions.

Capacity development of early-career scientists and professionals, and members of other societal groups is vital to enable APN member countries to formulate scientific evidence-based policies. Therefore, APN continuously strives to improve its capacity development agenda through:

- Enhancing efforts in providing support to early-career professionals through tailored research activities;
- Enhancing efforts in providing capacity development to early-career professionals that meet their specific needs, for example, by training them in developing high-quality scientific proposals;
- Continuing to strengthen APN's capacity development programme, CAPaBLE.
- Creating holistic and transdisciplinary capacity development activities on topics of relevance in the Asia-Pacific region.

PICES Science Priorities

PICES promotes transdisciplinary, multi-national collaborations to further collective understanding of the North Pacific's natural systems. As part of its vision, PICES aspires to be a leading contributor to global marine science and to be sought as a valued collaborator in addressing current and future management issues. The first goal of the 2016 PICES Strategic Plan is to "*Foster collaboration among scientists within PICES and with other multinational organizations, particularly with those that have common goals*".

PICES activities have been further guided by its current 10+-year integrated research program FUTURE (Forecasting and Understanding Trends, Uncertainty and Responses of North Pacific Marine Ecosystems). FUTURE is an integrative science program with a goal to understand and communicate the future of North Pacific ecosystems and the potential impacts from human use. More specifically, the

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program seeks to understand how marine ecosystems in the North Pacific respond to climate change and human activities, to forecast ecosystem status based on contemporary understanding of how nature functions, and to communicate new insights to its members, governments, stakeholders, and the public. FUTURE is in its synthesis phase and is due to end in 2024.

In January 2021 the United Nations launched a Decade of Ocean Science for Sustainable Development (UNDOS), which was seen as a valuable opportunity for PICES to expand its horizons, building on FUTURE's achievements and providing a new iteration of integrated activities. A joint program proposal (SmartNet) was submitted with our sister organization, ICES, in the Atlantic, and was endorsed by the Intergovernmental Oceanographic Commission. SmartNet now forms a major focus within PICES which will last until 2031. It will establish a global knowledge network (GKN) for ocean science by strengthening and increasing the collaboration of ICES/PICES and partner organizations. It will support and leverage ICES/PICES member countries' activities related to UNDOS, by emphasizing areas of mutual research interest including climate change and ecological forecasting, fisheries and ecosystem-based management, and the social, ecological and environmental dynamics of marine systems, including coastal communities. It also incorporates strategies to facilitate UNDOS cross-cutting inclusivity themes relating to gender equality, early career engagement, and involvement of indigenous communities and developing nations in the planning and implementation of joint activities. The governance structure and implementation plan for Smartnet is currently being developed and will develop recommendations for new and existing Expert Groups.

Scientific Areas of Joint Interest

The criterion used to determine topics that are of mutual interest and which to focus on in the short-term was a shared relevance to both Organization's objectives or priority areas. Research areas and activities where collaboration would be desirable were identified (**Table 1**) together with the priority for each organization.

Collaboration Mechanisms

Potential mechanisms for enhancing collaboration between APN and PICES include:

1. Workshops or Topic Sessions at PICES annual meetings

Joint sessions at PICES annual meetings, typically held in October, are an excellent potential mechanism for cooperation between PICES and APN. Most past annual meetings include examples of sessions that PICES has co-convened with other organizations, such as CLIVAR (Climate and Ocean: Variability, Predictability and Change), ICES (International Council for the Exploration of the Sea), IMBER (Integrated Marine Biogeochemistry and Ecosystem Research), NOWPAP (Northwest Pacific Action Plan), and SOLAS (Surface Ocean Low Atmosphere Study), among others. The benefits of sharing research findings in a theme session or sharing expertise in workshops have been demonstrated by these examples.

Topic session proposals from PICES scientists and co-sponsoring organizations should be submitted to the PICES website by the deadline, typically September 1 of the calendar year before the Annual Meeting of interest. Proposals should include: a title, duration (full or half day), session description, list

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of conveners, sponsoring PICES Scientific Committee(s), co-sponsoring organizations (if any), and whether (and where) a publication is intended. At the Committee meetings at the Annual Meeting in the fall (the year before the meeting of interest), recommendations for which session proposals to support are finalized. The Committee Chairs then present the recommendations to the Science Board (SB) who will evaluate and agree on co-sponsoring of sessions. The agreement will consider not just the scientific excellence and appropriateness of the proposals, but also the financial constraints of funding such sessions. The final list is then submitted to PICES Governing Council for final approval.

2. Joint Working Groups

Similar to the current joint APN-PICES Study Group on Scientific Cooperation in the North Pacific Ocean to develop the present Collaboration Framework, there may be a need to form other joint expert groups to address research priorities. Joint working groups represent one of the most effective mechanisms for collaboration and cooperation when there is a need to focus on a specific topic with specific deliverables defined by terms of reference. In general, joint working groups would be formed following one or a series of meetings and/or workshops that are organized on a common theme. Thus, effective planning is a crucial element in successfully establishing a new and productive working group. Typically, in PICES, a working group has a duration of three years. A proposal for a new working group should be submitted by one of the Committees to PICES Science Board for their review.

3. Conferences and Symposia

Normally, PICES organizes one major symposium per year in addition to its annual meeting. Typically, this symposium is jointly sponsored because of the financial commitments required to organize a major symposium. Organizations seeking co-sponsorship of a symposium by PICES should direct a letter of invitation to the Executive Secretary of PICES that describes the scientific rationale, other co-sponsoring organizations and a summary of roles and financial/in-kind contributions expected of PICES. Significant commitments of resources typically require 2–3 years advance planning. A potential example that may be an opportunity for co-sponsorship by APN is the next in the series of Early Career Scientist conferences (these alternate between ICES and PICES leadership), which would be expected to take place in a PICES country in 2027.

4. Representation at meetings and/or workshops

PICES and APN have a history of having representatives from other organizations participate in the annual meeting, including business meetings of relevant expert groups and workshops, where they can report on their organization's activities of interest and so foster collaboration. It is recommended that both organizations consider inviting one or more representatives from the other organization to participate in the meetings of, for example, the Steering Committee and Subregional Committee for the Pacific (for APN) and Science Board (for PICES) to update those bodies on ongoing research activities and research priorities for the future.

While hindered by the COVID pandemic, APN conducts at least one in-person subregional workshop to train early-career professionals on how to develop and submit effective proposals to APN for funding. In its current round of 2021 proposals, early-career professionals are leading 69% of projects funded by APN. This is a good indicator of its success. As APN's Pacific subregional Proposal Development Training Workshop (PDTW) is expected to be held in the coming year or two and as PICES and APN collaboration

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is engaging Pacific subregional members of APN, there is a potential opportunity to have a joint Proposal Development Training Workshop on one or more of the topics identified in the introduction. A similar opportunity may also be relevant for North Pacific Countries as well as APN and PICES members overlap. This is an area worth exploring further.

Monitoring and Reporting

Following the approval and implementation of this collaborative framework by the respective bodies of PICES and APN (i.e., the Science Board and the Steering Committee), this framework will continue for a period of five years at which time it will be reviewed to assess the progress on the areas identified in Appendix 1, and to identify new areas for collaborations. The review should also assess the collaboration mechanisms by identifying which ones were employed, the utility of those mechanisms in achieving desired results, and identify new mechanisms for future joint collaboration.

On an annual basis, there will be a progress report prepared by the Secretariat of each organization that is available for its members. This progress report should be common for both organizations, be a summary of joint activities between PICES and APN (including status and actions required to make progress on objectives), and be prepared in collaboration by both Secretariats. Further, this progress report will be presented annually at the PICES Science Board and the APN ~~annual~~-Steering Committee meetings as part of a standing item on their agendas. If modifications/alterations are required to joint activities to enable enhanced productivity and success, these recommendations will be approved by both the PICES Science Board and APN Steering Committee (via correspondence if necessary). For any joint activity that is completed, the co-convenors will prepare a summary report of the activity and it will be available for all members of both organizations.

Table 1. Recommended joint PICES-APN focus areas with associated rankings and mechanism to achieve progress within 5 years.

Activity or Research Area	PICES Rank	APN Rank	PICES Focus	APN Focus	Mechanism and potential platforms	Priority in next 5 years
<p>Activity: Capacity Development of ECOP.</p> <p>i. UNDOS cross-cutting theme</p>	High	CD of ECPs: high	<p>Major objective of SmartNet (UNDOS program). Major focus area for PICES recently with Advisory Panel on ECOP advisory-panels - PICES - North Pacific Marine Science Organization approved in 2021</p>	<p>One of the goals of APN's 5th Strategic Plan is capacity development, particularly that of early career professionals (ECPs)</p>	<ol style="list-style-type: none"> 1. APN – Capacity development programme (CAPaBLE) is one of the two main pillars of APN's activities; 2. APN's Proposal Developing Training Workshop (PDTW) in the Pacific region may benefit from PICES input if there is a marine theme. 3. Next ICES-PICES ECS Symposium planned for 2027 	High, Relevant to UNDOS
<p>Activity: Engaging Local and Traditional Ecological Knowledge</p> <p>i. UNDOS cross-cutting theme</p> <p>ii. Indigenous knowledge in the context of adaptation and disaster risk reduction</p> <p>iii. Indigenous Knowledge in the context of food and water security</p>	High	High (for the Pacific SRC)	<p>Major objective of SmartNet. Some activity at PICES-2022 (W6 for Bering Sea), Also planned for PICES-2023</p>	<p>"Global and indigenous knowledge" was one of the high priority topic areas of P-SCR for the 2021 call for proposals.</p>	<p>Workshops at upcoming events Will be discussed at PICES-APN side meeting in Busan, Sept 2022</p>	High, relevant to UNDOS

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Research area: Climate change; sustainable fisheries	High	Climate Change: high	Major objective of SmartNet, and several PICES Expert Groups	1. Food security (and habitat value) 2. Ecosystem services (non-food related) including cultural services		High, priority research area
Research area: Climate change; impacts of extreme events on coastal communities	High	High	New Working Group (WG49)	Adaptation and disaster risk reduction	Review WG plans as they develop. Look for opportunities to share outputs. Add an APN Ex-officio member	High, priority research area
Research Area: Marine plastic debris and microplastics	High	High	WG42 working-groups - PICES - North Pacific Marine Science Organization will end in 2022 but have indicated there should be a follow-on expert group (possibly a Section) to continue the work and link to Global initiatives	Marine plastic debris and microplastics are one of the focused areas under Goal 1 "Research" of APN's 5 th Strategic Plan.	Include APN members in a new Expert Group? Review WG plans as they develop. Look for opportunities to collaborate and share outputs.	Med-high, awaiting outcome of PICES Science Board recommendation on new EG
Research Area: Regional climate model downscaling in the Pacific	High	High	Active area of research in PICES nations; theme of S-CCME; theme of SUPREME and BECI (UNDOS Program/Project)	"Regional climate downscaling in the Pacific" was one of the high priority topic areas of P-SCR for the 2021 call for proposals.	"Regional climate downscaling in the Pacific" will remain a high priority topic of P-SRC for the APN FY 2022 Call for Proposals	High
Research Area: Circular and Ecological Economy	Med	High	Likely of interest to PICES Human Dimensions Committee.	CEE is one of the focused areas under Goal 1 "Research" of APN's 5 th Strategic Plan. Circular and Ecological Economy (CEE) is an initiative to enhance sustainable socio-		Med-high

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				economic activities by drawing on locally available energies, natural resources, infrastructure, industrial conglomerations, as well as the indigenous culture, particularly in rural areas.		
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