

FINANCIAL REPORT FOR YEAR 3 (ENDING MARCH 31, 2023)/FINAL FINANCIAL REPORT

1. PROJECT BACKGROUND, OBJECTIVES AND INITIATIVES

Benthic harmful algal bloom (HAB) species, such as the causative organism underlying *Ciguatera Fish Poisoning* (CFP), arguably have the greatest human health and economic impacts of any algal-based poisoning syndromes. CFP stems from the human consumption of fish containing toxins produced by benthic microalgae of the dinoflagellate genera *Gambierdiscus* and *Fukuyoa*, which are the initial sources of ciguatoxin. The effect of CFP on the human dimension extends far beyond the proximate health and economic outcomes – chronically-impacted communities in the Pacific region and elsewhere can become fearful of local and other fish sources and transition from their traditional ways of life to one where all protein is imported from foreign sources, altering their cultural heritage.

CFP is endemic in many tropical Pacific regions. Although ciguatera and other toxin producing benthic HABs can occur in pristine environments, anthropogenic pressures and climate change are leading to its emergence in new regions, and intensification in others. The expansion of dead corals and eel-grass habitats that replace healthy coral reefs facilitates intrusion and establishment of exotic populations of toxin-producing benthic algae. Despite the widespread impacts of benthic HABs, the resultant health and socioeconomic effects remain poorly understood.

Indonesia is part of the Coral Triangle, the most biodiverse marine area on Earth, and these extensive reefs are key to maintaining the ecological products that contribute to fisheries in this region. However, presently only about 7% of these coral reefs are in excellent condition, while anthropogenic stressors have left more than 35% in poor condition. Decreasing coral health in Indonesia is a relatively new phenomenon compared to other areas of the world, and the human coastal populations living adjacent to the deteriorating corals are not yet fully aware of the consequences of this change. Communities must understand the risks of exposure to keep the impact of benthic HABs to a minimum. The highest risk is when the reefs, which communities depend on for fish, have large patches of dead coral or large seagrass mats, as these surfaces are ideal for the growth of benthic algal cells. Current reports of benthic HAB occurrences such as CFP are low in Indonesia, almost certainly because diagnosis is difficult without proper training and experience.

The overall objective of the project “*Building local warning networks for the detection and human dimension of Ciguatera Fish Poisoning in Indonesian communities*” (*Ciguatera*) was to build the capacity of local small-scale fishers and community members to monitor their coastal ecosystems and coastal fisheries to benefit human health in Pacific Rim developing countries. This 3-year (April 1, 2020 – March 31, 2023) project was funded by the Ministry of Agriculture, Forestry and Fisheries (MAFF) of Japan, through the Fisheries Agency of Japan (JFA), from the Official Development Assistance (ODA) Fund. A total MAFF contribution was \$292,653 CAD.

Indonesia was chosen as a developing Pacific Rim country to implement the project. The importance of having more effective fisheries management practices is widely recognized in Indonesia, and this has led to support by the federal government and the willingness of stakeholders to consider new approaches such as the development and implementation of a citizen/fisher-based observation system linked with fisheries scientists and managers. The Ciguatera project was the fourth PICES project in Indonesia funded by MAFF, with its foundation being the robust collaborations with the Indonesian Agency for the Assessment and Application of Technology (BPPT) and the Indonesian Institute of Sciences (LIPI), now integrated into the Indonesian National Research and Innovation Agency (BRIN): “*Development of the prevention systems for harmful organisms’ expansion in the Pacific Rim*” (2007–2012), “*Marine ecosystem health and human well-being*” (2012–2017; [MarWeB](#)), and “*Building capacity for coastal monitoring by local small-scale fishers*” (2017–2020; [FishGIS](#)). Project activities were also supported through the Memorandum of Understanding between PICES and the Indonesian

Institute of Technology (ITI) (signed in March 2022), and by the Provincial Government of West Nusa Tenggara, which provided invaluable assistance in organizing a January 2023 training workshop in Lombok.

The FishGIS project led to the development and implementation of smartphone-based tools for fisheries and environmental observations, such as water quality, phytoplankton, fish catch, floating garbage (plastics) and Illegal Unregulated and Unreported (IUU) fishing, by local small-scale fishers and community members in Indonesia. The Ciguatera project aimed to adapt and further refine these smartphone-based capabilities for measurement and automated reporting, with the addition of benthic toxic algae measurements, to empower Indonesian coastal communities to minimize their CFP exposure in community-scale fisheries.

Consistent with the directives of the United Nations Decade of Ocean Sciences for Sustainable Development (UNDOS), the project included three major initiatives:

1. Coastal ecosystem monitoring activities by local small-scale fishers and other community members to detect ecosystem changes (*e.g.*, changes in water quality and the presence and changes in the spatial distribution of dead coral and eel-grass benthic environments) using smartphone-based technology developed during the FishGIS project and modified/refined during the Ciguatera project;
2. Detection of CFP toxin-containing dinoflagellates in the reef environment using two complimentary approaches: (a) implementation of smartphone-based tools developed during the FishGIS project, and modified/refined during the Ciguatera project, and (b) employing internationally-standardized sampling protocols for toxic benthic algae;
3. Training of local fishers and community members to utilize these tools for generating citizen-science data available for local decision-making on coastal fisheries to avoid the transfer of contaminated fish to the tables of families until the presence of CFP toxin-containing dinoflagellates is minimized.

In addition to the primary initiatives, early steps have been taken to explore two secondary initiatives: modifying the FishGIS application to incorporate (1) artificial intelligence-based assessment of fish stocks from the collective catch data reported by the local fishers, and (2) a tsunami early warning notification for remote fishing communities, with the goal of laying the foundation for future full development of these capabilities.

It was expected that the primary initiatives will be supported by a series of capacity building workshops led by scientists from PICES member countries, aiming to work with local communities to increase the sustainability of their fishing resources by providing them with CFP information. The field observations were planned to be carried out by local small-scale fishers and community members. It was anticipated that the combination of training and citizen-science contributions in the project would: (1) generate the needed capacity for monitoring CFP hotspots in Indonesian waters, (2) provide valuable datasets for the study of *Gambierdiscus* and *Fukuyoa* and the factors controlling their abundance in reef systems, and (3) increase human wellness by identifying fishing regions where the health of community members is at risk.

However, the COVID-19 pandemic seriously affected the original project strategy, especially by limiting the opportunity for PICES experts to visit field sites and organize meetings and community training workshops with local people. Only one capacity building workshop (though it was attended by more than 90 researchers from BRIN, ITI, University of Indonesia, Mataran University and provincial institutions, and coastal community members) was held in Lombok close to end of the project, in January 2023. The pandemic-related delays to the planned on-site training workshops led to augmenting and expanding BRIN-planned surveys of waters surrounding the Gili Matra region to facilitate data collection. A portion of Ciguatera project funds was re-directed to support a total of five extended surveys conducted in different seasons (dry, rainy and transition) during the period from May 2022 to February 2023.

A new 3-year project has been recently approved by MAFF, with expectation that one of major case study sites will be in the Gili Matra region, where a field sampling protocol has been already developed, preliminary network of local people and researchers has been set, and basic knowledge and technologies have been disseminated among the key people. The Provincial Government of West Nusa Tenggara has indicated strong interest and political will to assist to support activities of this project.

2. ORGANIZATIONAL AND FINANCIAL PRINCIPLES

PICES Governing Council approved the request from MAFF to undertake the project in February 2020.

The project had strong connections with the PICES Scientific Committees on Human Dimensions (HD), Marine Environmental Quality (MEQ) (through the Section on *Ecology of Harmful Algal Blooms in the North Pacific – S-HAB*) and Fishery Science (FIS), PICES Technical Committees on Data Exchange (TCODE) and on Monitoring (MONITOR), and the PICES FUTURE science program. The HD Committee was the parent committee for the project.

In accordance with the organizational principles agreed to by MAFF/JFA and PICES (Appendix, Clause 3), the project was directed by a Project Science Team (PST) formed by PICES Science Board based on principles and procedures detailed in the PICES Policy for approval and management of special projects (Decision 2017/A/7). All PICES member countries and all relevant Scientific and Technical Committees were represented on the PST, co-chaired by Dr. Mitsutaku Makino (Atmosphere and Ocean Research Institute, The University of Tokyo, Japan; mmakino@aori.u-tokyo.ac.jp) and Dr. Mark Wells (School of Marine Sciences, University of Maine, USA; mlwells@marine.edu). The PST Co-Chairs were responsible for the detailed planning and execution of the project, and annual reporting on scientific progress to MAFF/JFA and to PICES Science Board through the HD Committee. In PICES, Science Board took on the task for reporting to Governing Council on the progress and achievements of the project. The Year 1 progress report was submitted to MAFF/JFA on June 20, 2021 (accepted on June 27), and the Year 2 progress report was provided to MAFF/JFA on June 12, 2022 (accepted on June 29). A final scientific report is due to June 30, 2023.

According to the financial principles agreed to by MAFF/JFA and PICES (Appendix, Clause 4), Dr. Alexander Bychkov was appointed by the PICES Executive Secretary to serve as the Project Coordinator and was responsible for the management of the fund and annual reporting on its disposition to MAFF/JFA and to PICES Governing Council through the Finance and Administration Committee. In PICES, the Finance and Administration Committee took on the task for reporting to Governing Council on the financial and management aspects of the project. The Year 1 financial report was submitted to MAFF/JFA on June 12, 2021 (accepted on June 27), and the Year 2 financial report was provided to MAFF/JFA on June 12, 2022 (accepted on June 29). For the budget execution in Year 3 see Section 4 of this report.

3. PROJECT BANK ACCOUNT

The special account for the project was established at the bank used by PICES:

Bank name:	TD Canada Trust
Bank number:	004
Branch number:	99000
Branch address:	1080 Douglas Street, Victoria, B.C., Canada. V8W 2C3
SWIFT Code:	TDOMCATTOR
Account number:	5313568
Account holder:	North Pacific Marine Science Organization (PICES)
Account holder address:	9860 West Saanich Road, Sidney, B.C., Canada, V8L 4B2

- The set of documents requesting funding for Year 1 (FY2020: April 1, 2020 – March 31, 2021) was sent to MAFF/JFA, through the Consulate General of Japan in Vancouver (Canada), on June 29, 2020, and funds in the amount of \$99,861 were received at the PICES/MAFF bank account on October 30, 2020.
- The set of documents requesting funding for Year 2 (FY2021: April 1, 2021 – March 31, 2022) was sent to MAFF/JFA, through the Consulate General of Japan in Vancouver (Canada) on June 22, 2021, and funds in the amount of \$99,875 were received at the PICES/MAFF bank account on August 10, 2021.
- The set of documents requesting funding for Year 3 (FY2022: April 1, 2022 – March 31, 2023) was sent to MAFF/JFA, through the Consulate General of Japan in Vancouver (Canada) on June 9, 2022, and funds in the amount of \$92,917 were received at the PICES/MAFF bank account on July 21, 2022.

4. BUDGET EXECUTION FOR FISCAL YEAR 3

The MAFF contribution for Year 3 of the project was \$92,917. Allocations and actual expenses for each budget category are shown in Table 1 (it should be noted that modifications to the original Year 3 workplan were due to the COVID-19 situation). Table 2 provides more details on expenses for specific activities. Table 3 summarizes income and expenses for the entire 3-year project lifetime. The allocated funding was completely spent by March 31, 2023.

Table 1 Allocations and expenses (in \$ CAD) for Year 3 (April 1, 2022 – March 31, 2023)

Category	Year 3 Allocations	Year 3 Expenses	Difference
Travel and meetings	55,000	97,338	42,338
Contracts	16,500	14,033	2,467
Equipment and supplies	8,000		8,000
Miscellaneous	1,338	558	780
Overhead	12,079	12,079	0
Total	92,917	124,008	31,091
Year 2-end account balance			31,091
Account balance			0

Table 2 Expenses (in \$ CAD) for various budget categories for Year 3

Activities	Expenses
Travel/meetings	97,338
<ul style="list-style-type: none"> ▪ Project coordinator travel to discuss project’s status and expected products and reports ▪ Sixth PST meeting to: (1) review the current state of the FishGIS application, (2) assess the results to date from the field sampling program in the Gili Matra region and modify, if needed, plans for the follow-up surveys, and (3) discuss activities for the rest of Year 3, including a community training and knowledge dissemination workshop in Lombok in January 2023 and a final PST meeting in March 2023 (September 2022, in conjunction with PICES-2022 in Busan, Korea). ▪ Community training and knowledge dissemination workshop (January 2023, Lombok, Indonesia) ▪ Seventh PST meeting to: (1) review the results from the Indonesian field sampling program in the Gili Matra region (May 2022 – February 2023), and the January 2023 community training workshop in Lombok (Indonesia), (2) summarize the outcomes from the project and finalize the tasks for the preparation of the final reports, and (3) set the stage for a new 3-year (2023–2026) PICES-MAFF project (March 2023; Yokohama, Japan) 	<p style="text-align: right;">4,333</p> <p style="text-align: right;">11,706</p> <p style="text-align: right;">60,544</p> <p style="text-align: right;">20,755</p>
Contracts	14,033
<ul style="list-style-type: none"> ▪ eDNA analysis of samples collected during the PICES Ciguatera field surveys ▪ Preparation of reports 	<p style="text-align: right;">8,264</p> <p style="text-align: right;">5,769</p>
Miscellaneous (mailing/communication, bank fees)	558
Overhead to PICES	12,079
Total	124,008

Table 3 Income and expenses for the project from April 1, 2020 – March 31, 2023

	Year 1	Year 2	Year 3	Total
From previous year		12,090	31,091	
Revenue				
MAFF Contribution	99,861	99,875	92,917	292,653
Interest	21			21
Total	99,882	99,875	92,917	292,674
Expenses				
Travel and meetings		53,550	97,338	150,888
Contracts	64,454	14,274	14,033	92,761
Equipment and supplies	10,000			10,000
Miscellaneous	356	66	558	980
Overhead	12,982	12,984	12,079	38,045
Total	87,792	80,874	124,008	292,674
Revenue less Expenses	12,090	31,091	0	0

5. ACCOUNT AUDIT

For the period prior to December 31, 2022 (from the start of the project until the first nine months in Year 3), the status of the MAFF (Ciguatera) account was assessed during the regular external audit for PICES' FY 2020 (January 1 – December 31, 2020), PICES' FY 2021 ((January 1 – December 31, 2021), and PICES' FY 2022 (January 1 – December 31, 2022). In the auditor's opinion for these years, the financial statements present fairly, in all material respects, the financial position of the North Pacific Marine Science Organization, and the results of its operations and changes in fund balances for the years then ended. The financial statements for the rest of Year 3 (January 1 – March 31, 2023) will be evaluated during the regular audit for PICES' FY 2023 (January 1 – December 31, 2023).

APPENDIX

PROJECT PRINCIPLES

1. The overall goal of the project entitled “*Building local warning networks for the detection and human dimension of Ciguatera Fish Poisoning in Indonesian communities*”, funded by the Ministry of Agriculture, Forestry and Fisheries (MAFF) of Japan, through the Fisheries Agency of Japan (JFA), is to build the capacity of local small-scale fishers and community members to monitor their coastal ecosystems and coastal fisheries to benefit human health in Pacific Rim developing countries. The focus of this project is to detect and monitor *Ciguatera Fish Poisoning* (CFP) in tropical reef fisheries, which globally has the greatest human health and economic impacts of any algal-based poisoning syndromes. The aim of the project is to adapt smartphone-based observation tools developed in the 2017–2020 PICES-MAFF project on “*Building capacity for coastal monitoring by local small-scale fishers*” (FishGIS) to empower Indonesian coastal communities to assess, detect, and minimize their exposure to CFP in community-scale fisheries. The project also is intended to foster partnerships with non-PICES member countries and related international programs and organizations. The MAFF contribution is from the Official Development Assistance (ODA) Fund and therefore, involvement of developing countries in project activities is required.
2. The duration of the project is 3 years, with the ending date set as March 31, 2023.
3. The following organizational principles agreed to by MAFF/JFA and PICES apply to the project:
 - The project will have strong connections and interactions with, and support relevant activities of, the PICES Scientific Committees on Human Dimensions (HD), Marine Environmental Quality (MEQ) (through the Section on *Ecology of Harmful Algal Blooms in the North Pacific – S-HAB*) and Fishery Science (FIS), PICES Technical Committees on Data Exchange (TCODE) and on Monitoring (MONITOR), and the PICES FUTURE (Forecasting and Understanding Trends, Uncertainty and Responses of North Pacific Marine Ecosystems) science program (specifically, Research Theme 3 on “*How do human activities affect coastal ecosystems and how are societies affected by changes in these ecosystems?*”). The HD Committee will serve as the parent committee for the project.
 - The project will be directed by a Project Science Team (PST) formed based on principles and procedures detailed in the PICES Policy for approval and management of special projects (Decision 2017/A/7). All the above-mentioned groups and all PICES member countries are expected to be represented on PST.
 - The PST will be co-chaired by PICES members, with one Co-Chair from Japan, representing the Human Dimensions Committee, and the other from the USA, representing the Section on *Ecology of Harmful Algal Blooms in the North Pacific*. These Co-Chairs will provide the geographical balance and the balance of expertise between the human dimension and harmful algal bloom components of the project. The PST Co-Chairs are responsible for the scientific implementation of the project and annual reporting to MAFF/JFA and to PICES Science Board through the HD Committee. This report should be submitted to JFA within 90 days after the close of each project year ending March 31, and include a summary of the activities carried out for the year, with an evaluation on the progress made, and a workplan for the following year.
4. The following financial principles agreed to by MAFF/JFA and PICES apply to the project:
 - A separate bank account shall be established to deposit the remitted funds.
 - The PICES Executive Secretary or a Project Coordinator designated by the Executive Secretary is responsible for the management of the fund and for the annual reporting on its disposition to MAFF/JFA and PICES Governing Council, through the Finance and Administration Committee, within 90 days after the close of each project year ending March 31.

- Travel and meetings – this category covers travel costs associated with project activities such as field studies, organizational trips, project meetings, workshops, scientific sessions and public events.
 - Contracts – this category covers grants/fees to be paid to consultants and experts employed to implement the project. Tasks and deliverables for contractors are to be determined by the PST Co-Chairs. To support the objectives of the project and to ensure that its activities have minimal impact on the workload of the existing staff of the PICES Secretariat, the Project Coordinator can employ additional staff as required.
 - Publications – this category covers costs associated with publishing findings of the project in special issues of peer-reviewed journals, reports and brochures, and dissemination of these materials.
 - Equipment – this category covers purchases and shipment of equipment for laboratory/field data/sampling processing/analysis, computer hardware/software for the development of database(s) and the project website.
 - Miscellaneous – this category covers expenses associated with the project (mail and phone charges, bank charges, *etc.*) and includes contingencies such as fluctuations in currency exchange rates.
 - Transfers of up to 10% of allocations between the budget categories are allowed based solely on the decision by the PICES Executive Secretary or the Project Coordinator. In special cases, transfers up to 20% between the budget categories can be authorized by JFA. All transfers shall be reported at the end of the fiscal year.
 - A 13% overhead on the annual budget shall be retained by PICES to offset expenses related to the Secretariat's involvement in the project.
 - The interest earned by the fund shall be credited to the project and used in consultation with JFA.
 - Any funds remaining after the completion of every fiscal year of the project shall be reported and disposed of in consultation with JFA.
5. Ownership of the outcomes of the project, including materials, data, copyright and intellectual property rights, will be vested to PICES and the Government of Japan. Either Party may use those outcomes, but will give full credit to their source.