

Report of Working Group on *Non-indigenous Aquatic Species*

The Working Group on Non-indigenous Aquatic Species (hereafter WG 21) held its sixth meeting October 14-15, 2011 under the chairmanship of Ms. Darlene Smith who presented opening remarks and welcomed participants. WG 21 members from three PICES member countries (Canada, Japan and USA) and observers from the Northwest Pacific Action Plan (NOWPAP) and the IOC Sub-Commission for the Western Pacific (WESTPAC) were present (*WG 21 Endnote 1*). On the first day, the agenda dealt with items 1 to 4, with the remainder being discussed on the second day. The agenda for the meeting can be found in *WG 21 Endnote 2*.

AGENDA ITEM 2

Country and organization reports

Canada

The first Canadian Aquatic Invasive Species Network (CAISN), which was established in 2006, came to a close in 2011. The focus of the network was to identify and quantify the vectors and pathways by which aquatic invasive species enter Canada, determine factors that affect their colonization success, and develop risk assessment models for potential and existing aquatic invasive species. A report on CAISN is available at: http://www.caisn.ca/uploads/CAISN_FinalReport20112.pdf.

The Canadian Government has renewed funding for CAISN to address remaining information gaps. Future research will focus on four new core themes:

- Early Detection,
- Rapid Response,
- AIS as Part of Multiple Stressors,
- Reducing Uncertainty in Prediction and Management

More information can be found online <http://www.caisn.ca/en/index.php>.

Currently there are two research projects underway in the Pacific including: Characterizing effects of trophic interactions between native and non-native filter feeders on establishment and spread of aquatic invasive species, and evaluation of the efficacy of trap out efforts to control invasive European green crab: Lessons from Pipestem Inlet, BC.

Fisheries and Oceans Canada is also currently developing a national regulatory proposal to address the threat of aquatic invasive species.

Japan

A new species of non-colonial tunicate *Ascidella aspersa*, first identified in Japan in 2009, has become widespread. It is causing serious damage to various cultured species, especially scallops. Work to confirm the validity of identification and origin of this species is ongoing.

Future funding from the Japanese Ministry of Agriculture, Forestry and Fisheries (MAFF), which has funded two WG 21 initiatives, will now focus on how to use coastal ecosystems sustainably and will not be directed specifically to non-indigenous species.

Russia

Dr. Alexi Gorodkov provided a summary of non-indigenous species in the Far East of Russia. There are currently 66 species listed that are in various stages of introduction. The species list can be found in the following paper: Non-indigenous species in the Far-Eastern seas of Russia. Zvyagintsev A.Yu., Radashevsky V.I., Ivin V.V., Kashin I.A. and Gorodkov A.N. 2011. *Russian Journal of Biological Invasions*. 2(2-3): 44-73.

Russia is considering ratification of the International Convention for the Control and Management of Ships' Ballast Water and Sediments. (N.B. Canada and Korea are the only two PICES member countries to have signed the convention.)

United States of America

The U.S. Fish and Wildlife Service (USFWS) is leading the North Pacific Landscape Conservation Cooperative (NPLCC), one of the many LCCs in a new national network aimed to address large-scale conservation issues like climate change and invasive NIS through a collaboration of natural resource agencies and universities. The NPLCC includes estuarine and coastal waters from Northern California to southeast Alaska. Although the NPLCC is still formulating its priorities and has not yet significantly addressed marine bioinvasions, it is anticipated that this will become a priority in the future.

As part of the National Fish Habitat Action Plan, USFWS and the National Oceanic and Atmospheric Administration (NOAA) are helping lead the formation of a new Pacific Marine and Estuarine Fish Habitat Partnership that will encompass California, Oregon, and Washington coastal waters. As with other fish habitat partnerships under this national program, this effort may be a source of additional resources for non-indigenous species monitoring and control.

The National Ocean Policy, established by Presidential Executive Order on July 19, 2010, includes nine National Priority Objectives that address pressing issues such as climate change and ocean acidification. A strategic action is being developed for each one of these objectives. (<http://www.whitehouse.gov/administration/eop/oceans>). Invasive species components are being incorporated into strategic action plans to:

- identify and prevent high-risk introductions of non-native species;
- increase research capacity to document economic and ecological impacts; and
- establish interagency partnerships to bring together expertise, strengths and resources to control existing populations.

NOAA has assisted in updating and revising the Hazard Analysis and Critical Control Point (HACCP) planning process to increase its benefit to preventing the spread of invasive species. The revised HACCP planning process includes a stronger emphasis on risk assessment in order to identify high-risk activities and focus attention on actions needed to reduce the movement of potential invasive species. NOAA will continue to offer HACCP training sessions to staff and grant recipients.

There is increased interest in non-indigenous tunicates in the Northeast Pacific since *Didemnum vexillum* was discovered last year on the Oregon coast and in Sitka, Alaska. In both cases, consideration of eradication opportunities were clouded by uncertainty about species range and the limited success of previous control efforts of this species and other non-indigenous tunicates in Puget Sound. There is also limited information available to help predict the ecological and economic implications of an invasive tunicate invasion in nearshore habitats. Citizen scientists were key to the discoveries in both Oregon and Alaska and continued to help with additional surveys in 2011 – illustrating the value in engaging nonprofessional groups in early detection of marine non-indigenous species.

The recent northward range expansion of *Undaria pinnatifida* into San Francisco Bay continues to raise concerns about its potential establishment in Oregon and Washington coastal waters. Currently there is no substantial effort to regularly survey for this macroalgae in the Northwest, nor is there much information available to estimate its potential impacts or plan for rapid response opportunities.

The West Coast Governor's Agreement on Ocean Health continues to support a *Spartina* Action Coordination Team and the associated goal of eradicating non-indigenous *Spartina* spp. from the West Coast by 2018.

Northwest Pacific Action Plan (NOWPAP)

Dr. Sangjin Lee provided an overview of NOWPAP activities related to aquatic invasive species. A regional report entitled “*Regional Overview and National Reports on the Marine Invasive Species of the NOWPAP Region*” has been produced. It contains information on current activities, threats and management, and information on current and ongoing research projects, and can be found at <http://dinrac.nowpap.org>.

IOC Sub-Commission for the Western Pacific (WESTPAC)

Dr. Suchanna Apple Chavanich gave an update on WESTPAC activities related to non-indigenous species conducted under the Project on Coastal Marine Biodiversity. The objectives of this project are to understand and provide the scientific basis for biodiversity management, to establish an effective management plan and monitoring programs for marine biodiversity among WESTPAC member countries and to encourage research collaboration and exchange of knowledge among WESTPAC countries.

Of note for 2011 was the IOC-WESTPAC/PICES joint workshop on “*Rapid Assessment Survey Methodologies for Detecting Marine Non-Indigenous Species*” held July 19–21. The purpose of the workshop was to provide a contextual perspective on why monitoring for non-indigenous species is important; to educate participants in RAS methodologies and demonstrate their application; and to provide participants with an overview of the PICES WG 21 database and how all can benefit from such an application. Twenty-nine participants from 9 countries (Canada, China, Indonesia, Korea, Malaysia, Philippines, Singapore, Thailand and Vietnam) attended.

AGENDA ITEM 3

Reports on WG 21 inter-sessional activities in 2011*Demonstration Rapid Assessment Survey (RAS) in Thailand*

As mentioned above, the second demonstration workshop was conducted July 19–21, 2011 in Phuket, Thailand. Twenty-nine participants from 9 countries were provided with an overview of the rationale behind rapid assessments and the methods developed and used by WG 21. Two intertidal field sites were visited to collect scrapings and collector plates. A significant advantage of these methods is their low cost. It was noted that tropical waters have a high percentage of unknown species and taxonomy issues. Dr. Hiroshi Kawai (Kobe University, Japan) gave a presentation on molecular tools for species identification. Participants indicated that they were very satisfied with the workshop and that they intended to initiate rapid assessment projects in their home countries.

Seventh International Conference on Marine Bioinvasions

The Seventh International Conference on Marine Bioinvasions was held August 23–25 in Barcelona, Spain. Dr. Thomas Therriault served on the conference Scientific Steering Committee, representing WG 21. The theme of the conference was “*Advances and gaps in understanding marine bioinvasions*”. PICES provided travel support to 8 graduate students and 4 postdoctoral fellows from PICES member countries to attend the conference. Additional information on the conference can be found at http://www.pices.int/publications/pices_press/volume20/v20_n1/pp_32-33_MBIC.pdf. The Eighth Conference on Marine Bioinvasions is to be held in 2013 on Canada’s West Coast. This location was chosen to increase participation from Western Pacific countries.

RAS 2011 in Vostok Bay, Russia

The fourth WG 21 RAS was conducted from October 7–14, 2011, at the Vostok Marine Station. Most of the sampling was conducted in and around Vostok Bay in habitats that varied from small harbors to rocky shores and mud flats. Collector plates were deployed for 5 months. Two sets of these plates were recovered from Vostok Bay and one from the international harbor in Vladivostok. Participants from all PICES member countries attended. Additional information on the Russian rapid assessment survey can be found at http://www.pices.int/publications/pices_press/volume20/v20_n1/pp_26-29_RAS-2011.pdf.

Database and atlas project

The framework for the NIS atlas and database was published in a peer reviewed journal. The citation for this paper is: Evolution of natural history information in the 21st Century – Developing an integrated framework for biological and geographical data. Reusser, Deborah A. and Lee II, Henry, J. 2011. *Journal of Biogeography* 38: 1225–1239 and can be found online at <http://onlinelibrary.wiley.com/doi/10.1111/j.1365-2699.2011.02515.x/pdf>

The Atlas of Non-indigenous Marine and Estuarine Species was peer reviewed. The Atlas is generated from the database and contains 700 species and is now 1800 pages long. For each taxa there is a two-page profile containing extensive information on habitat requirements, life history and distribution (native and non-native ranges). The Atlas also contains an extensive bibliography.

AGENDA ITEM 4

MAFF projects plans for 2012

Taxonomy project

A third and final demonstration RAS workshop is scheduled for February 8–9, 2012 in Nagasaki, Japan. The workshop will be held in collaboration with NOWPAP and IOC-WESTPAC and will be hosted by Dr. Takeo Kurihara of the Japanese Fisheries Research Agency at the Seikai National Fisheries Research Institute in Nagasaki.

Database and atlas project

The Atlas of Non-indigenous Marine and Estuarine Species generated from the PICES Non-indigenous Species Database will be published in electronic format. Development of a web application for the database, hosted by the U.S. National Atlas Program will continue.

Final reports on the two initiatives will be provided to MAFF.

AGENDA ITEM 5

WG 21 terms of reference

WG 21 is scheduled to complete its mandate with its last meeting at PICES-2012 in Hiroshima, Japan. The final report to meet the terms of reference will be prepared for review and revision at the Hiroshima meeting.

WG 21 Endnote 1

WG 21 participation list

Members

Blake Feist (USA)
Takeo Kurihara (Japan)
Henry Lee II (USA)
Debbie Reusser (U.S.A.)
Darlene Smith (Canada, Co-Chair)
Thomas Therriault (Canada)
Hisashi Yokoyama (Japan)

Observers

Suchanna Apple Chavanich (WESTPAC)
Alexi Gorodkov (Russia)
Sangjin Lee (NOWPAP of UNEP)

WG 21 Endnote 2

WG 21 meeting agenda

October 14, 2011 (Saturday, 9:00am-5:30pm)

1. Opening remarks and introductions
2. Country and organization updates
3. Reports on WG 21 inter-sessional activities in 2011
4. MAFF projects plans for 2012

October 15, 2011 (Sunday, 9:00am-12:30pm)

5. WG 21 terms of reference