

**NORTH PACIFIC MARINE SCIENCE ORGANIZATION (PICES)
PUBLICATIONS: WHAT'S THE ACCESS AND WHERE'S THE VALUE?**

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ABSTRACT:

In a fit of cooperation and with an eye on the future, IAMSLIC and PICES have been reviewing PICES publications to enhance access through better indexing and online presence. The impressive body of publications by the North Pacific Marine Science Organization, the North Pacific equivalent of ICES, ranges from annual reports to newsletters to special issues of peer reviewed journals. We worked with our PICES counterparts to identify the body of publications, evaluate cost, explore options and describe impact of the publications on science. Our findings will be presented at the PICES Annual Meeting in late October 2007.

Keywords: Open access; information handling; digital archives; grey literature; citation patterns

Introduction and Background

The North Pacific Marine Science Organization (PICES) was established in 1992 to promote and coordinate marine scientific research and data sharing challenges in the North Pacific Ocean. To fulfill this mission, a vigorous publications program has grown out of the crucial need for efficient communication with a highly varied audience. PICES publications are a record of the activities and scientific findings of the organization.

- *Annual Reports* are the official administrative record of the Organization and they describe the various activities of PICES, including its meetings, expenditures, and planning, by calendar year.
- *PICES Press* is a newsletter published twice annually, giving members and those interested in PICES updates on current projects, new research developments, notices of upcoming events, and listings of new publications.
- The *Scientific Report* series is used primarily to document PICES workshops and to provide a publishing venue for final reports of PICES working groups on given topics as well as planning reports as appropriate.
- *Special Publications* and *books* are published irregularly, tending to be of broader interest to a wider audience.
- *Abstract Books* provide brief summaries of presentations and posters at Annual Meetings and other symposia (co-) organized by PICES.
- *Special Issues* are collections of peer-reviewed articles in a variety of primary scientific journals, arising from symposia or topic sessions, occasionally published in collaboration with other organizations, using commercial publishers to extend the reach of PICES-related work.

In September 2003, the first review of the PICES publications program was done at the request of the PICES Finance and Administration Committee. The goal was to examine the costs, methods, and possible efficiency of producing and distributing PICES publications. The variety of recommendations was mostly implemented (North Pacific Marine Science Organization, 2005).

Publishing is an expensive and time-consuming activity; however the products generated are important in fulfilling the organization's mission. PICES relies on a small, dedicated staff and the efforts of individual volunteers and organizational members to accomplish its publishing goals. Given this, the PICES Executive Secretary asked the International Association of Aquatic and Marine Science Libraries and Information Centers (IAMSLIC) to examine strategies to maintain the vitality of the PICES publications program while being mindful of costs and emerging options for communications. Consulting with PICES staff, we examined the efficiency of the program primarily in terms of distribution and archiving practices and the degree to which PICES is reaching its intended audience in a timely fashion.

PICES is perhaps indicative of other non-governmental organizations with active publications programs but little or no staff to effectively manage the distribution and preservation of its intellectual output in a way that will continue to be accessible to a changing audience. Our review process and resulting recommendations may be applicable to some of these organizations (North Pacific Marine Science Organization, in

press). As IAMSLIC is concerned with access to appropriate content and particularly cognizant of the challenges with identifying and accessing grey literature, our work is

useful in justifying the need for and validating the worth of such literature. We examined current collecting, archiving, and indexing of PICES publications, as all are indicators of access. We used OCLC and the IAMSLIC Distributed Library to gather information on collecting patterns. Various databases including *Aquatic Science and Fisheries Abstracts (ASFA)* and *Fish and Fisheries Worldwide (FFW)* were searched for indexing information. We looked at citation patterns using Web of Science and Scopus as one means of assessing usage of PICES publications by the scientific community. The following describes our findings with a concluding discussion of persistent issues with making the grey literature of marine science visible and accessible.

Indexing of PICES publications

People use information they can find easily. If PICES publications are not well indexed or cataloged, they are not as accessible and their impact on the scientific community will be limited. PICES publications are discovered through word-of-mouth, and by searching tools such as library catalogs, web search engines, and specialized literature databases.

We searched *ASFA*, *BIOSIS*, *FFW*, *WAVES*, *Web of Science* and *Zoological Record* to see how well PICES publications were indexed as a reflection of how easily a person could identify PICES materials. Our search strategy focused on PICES or North Pacific Marine Science Organization as a publisher or corporate author. This allowed us to see if the tools acknowledged PICES as a corporate author, publisher, or sponsor of publications. These results would not include the journal special issues unless PICES is included as an author or publisher.

Excluding the 411 journal special issue articles, we found 514 items listed as PICES publications, including many articles that were published within the Scientific Reports. Table 1 indicates the variability in level of indexing of PICES published material. The difference between the Total Hits and Relevant Hits reveals the problem of precision with searching PICES as an author or publisher. Five of these tools are commercial indexes with the sixth, WAVES, being the library catalog for the Canadian Department of Fisheries and Oceans Libraries. Typically, we would expect fewer records in a library catalog than the commercial indexes as the catalog rarely covers materials to the article level.

Table 1: Indexing of PICES publications excluding journal articles

Index/Database Searched	Total Hits	Relevant Hits
Aquatic Sciences and Fisheries Abstracts (ASFA)	258	159
BIOSIS	6	4
Fish and Fisheries Worldwide (FFW)	399	360
WAVES (Catalog of DFO libraries)	80	64
Web of Science	21	20
Zoological Record (CSA)	77	39

There is little overlap among the various indexing tools, which suggests differing policies toward indexing, differing awareness of PICES publications, or both. The two major tools, *ASFA* and *FFW*, share the most records (22). This is partly a distribution issue, and steps could be taken to ensure that these indexing entities receive copies of PICES publications. More importantly, the discrepancy of coverage reflects a particular format bias of certain indexes (e.g., *Zoological Record* and *Web of Science*) or a priority given to the reports by others (e.g., *ASFA*).

An additional issue with indexing is the level of granularity. For example, many of the Scientific Reports include papers by various authors, yet few of the Scientific Reports are indexed at the resolution of the individual article, making those papers invisible. Table 2 summarizes the coverage of the Scientific Reports and their multiple articles by the indices. It reinforces the evidence for gaps in distribution, and the inconsistency of coverage within an index. It was interesting to note the variability in indexing of articles within a given scientific report. *ASFA* and *FFW* have higher numbers than the others. However, neither index resolved all Scientific Reports to the article level, nor indexed the same ones. In general, *FFW* covered more reports and with more depth than the other indices. It also indexes *PICES Press* more thoroughly at the article level.

Table 2: Indexing of Scientific Reports

Index or Catalog (Vendor)	Reports indexed as individual titles	# Reports indexed in some form (t=32)	# Report articles indexed (t=302)
<i>ASFA</i> (CSA)	1-10	10	98
<i>BIOSIS</i> (Ovid)	0	0	0
<i>FFW</i> (NISC)	1,8,9,11,13-16, 19- 21, 25, 27-30	22	196
<i>WAVES</i> (DFO)	32	32	0
<i>Zoological Record</i> (CSA)	19, 30, 32	3	10
<i>Web of Science</i> (WOS)	0	0	0

Our examination of the current level of indexing of PICES publications reveals some significant areas of concern. Visibility and hence usage of PICES publications, in part, relies on consistent and thorough coverage in the major tools used by marine scientists. Access through commercial indexes is problematic. Scientists have to use multiple tools to identify PICES materials, and still would not find all items published under the auspices of PICES. Our concerns include consistency of coverage of the Scientific Reports at the report level as well as the depth of indexing at the article level. Underused publications caused by lack of granular access via commercial indexes may subsequently affect collection development decisions in the libraries as well.

Current collecting and archiving of PICES publications

Printed publications

We gathered and examined data on archiving practices of libraries as a method of assessing access to print versions of PICES publications. Some libraries may link to digital copies in their catalog records; however, we wanted to ascertain the stability of print archives before introducing the concept of digital archives. Selected libraries provide satisfactory access to print and digital versions of PICES publications via their local catalogs. These are shared through the international, cooperative library catalog, WorldCat, provided by the Online Computer Library Center (OCLC). This provides exposure of the publications to the broader library community. People can use the OCLC database through its web interface that is freely available from <http://www.worldcat.org>. This tool provides good, open access to PICES material.

We used OCLC WorldCat as our primary data source, but we also reviewed the IAMSLIC membership to help identify additional collections not found in OCLC WorldCat, but likely to be in archives of member libraries located outside of North America. WorldCat data reveals a bias toward more active participation on the part of

North American libraries. Together, these cooperative catalogs provide an efficient and somewhat effective method to obtain a picture of print archiving and access.

Table 3 suggests that PICES publications in print are adequately collected, and hence accessible to readers in North America. The exceptions are the annual meeting abstracts that are inconsistently collected by libraries, probably due to the distribution process. Access to publications via libraries located outside of North America is unclear. In part, this is a limitation of the OCLC WorldCat and indicates the need for more data on the collection policies of PICES Contracting Parties in Korea, China, Japan, and Russia. We intend to pursue through a survey of appropriate institutions and libraries (Appendix A).

Table 3: Numbers of libraries holding PICES publications displayed in WorldCat

Publication	# OCLC Libraries
Annual Report Series	20
Scientific Reports Series	19
Special Publication Series	
no.1	23
no.2	14
Brochure(s)	6
PICES Press	16
Books	
Dynamics of the Bering Sea	60
Historical Atlas of the North Pacific Ocean	252
The Journey to PICES	39
Annual Meeting Abstracts	
1997	8
Primary Journal Literature	
Progress in Oceanography	611
Journal of Oceanography	87
Canadian Journal of Fisheries and Aquatic Sciences	609
Deep Sea Research Part II	214
Marine Environmental Research	192
ICES Journal of Marine Science	176
Journal of Marine Systems	88
Ecological Modelling	281

Access to print PICES publications appears somewhat robust; however, access is strongly dependent on where a user is geographically located and with which organization he/she is affiliated. For those not affiliated with PICES or an institution supporting a library with a PICES print collection, alternative means of acquiring copies are required. Resource sharing (interlibrary loan) is the primary means by which libraries augment their collections, and association memberships provide the means to make borrowing requests.

So, we examined the PICES distribution system in terms of library affiliation, as this could be an indicator of access through resource sharing as well as local collections. Currently, there are 63 libraries on the PICES libraries distribution list and 69 on the PICES institution distribution list. There appear to be 14 PICES institutions on the current distribution list that have libraries affiliated with their organization, but those libraries are not on the PICES library distribution list. Half of those 14 libraries have IAMSLIC affiliations. Half of the 63 libraries that receive PICES distribution and whose parent institutions receive PICES distribution as well have IAMSLIC affiliations. While geographic distribution and need for print distribution requires further examination, there is an opportunity for IAMSLIC and its network to not only help balance geographic distribution of PICES publications where needed, but also to help fill the gap as needed through resource sharing.

Collecting patterns in WorldCat demonstrate a strong commitment to print archiving among certain libraries. Approximately 35 of the 63 libraries receiving PICES distribution have some form of OCLC affiliation. Twenty-one of those libraries also have IAMSLIC affiliation. Those libraries are also included in the approximately 80 OCLC Libraries that hold at least one PICES publication and display those holdings on WorldCat. This reinforces the concept that IAMSLIC member libraries are committed to collecting and archiving PICES publications. Appendix B describes conditions at key institutions with recommendations for activity in the future.

Several libraries are cataloging digital copies of PICES Scientific Reports in conjunction with the print copies, facilitating access through library catalogs. Our collection and archiving concerns include not only the robustness of PICES digital archive and the current format of PICES digital documents, but also open access to journal articles and issues sponsored by PICES but hosted on commercial publishing websites.

While collection of and access to PICES published items appears adequate, challenges arise when considering the commercially published journal issues. Collecting these major commercial journals is expensive and many smaller institutions cannot afford the subscription cost for either print or electronic copies. Access is controlled by subscription, either institutional or personal. Furthermore, copyright issues generally prevent libraries from lending or copying an entire issue of a given journal.

Consequently, this significant component of the PICES publication program may not be adequately accessible to all PICES members or other interested parties. Solutions exist,

including negotiation with publishers for the right to archive articles in an open digital repository, or publishing in a non-commercial venue without copyright restrictions, such as the PICES special publications series. The Creative Commons (<http://creativecommons.org/>) and Scholarly Publishing and Academic Research Coalition (<http://www.arl.org/sparc/>) provide examples of ways to work with copyright agreements so authors' rights are respected and publishers' work acknowledged yet access is more open. The degree to which publishers pursue adherence to copyright restrictions is often determined by the publisher's need to maintain profitability. PICES, as a publisher, may choose to take a less restrictive stance on copyright as a means to increase accessibility to its publications.

Digital publications

The availability of almost all PICES publications in digital format from the PICES website is positive. This assumes, however, that most people interested in a PICES publication can identify it and then have adequate computer and network capability to download files.

One indicator of access to and use of electronic versions of PICES publications is to examine the number and location of organizations linking to the PICES site on the web. We used a Google application to identify websites that linked to the PICES website. Only two sites, a Chinese mirror of PICES (mari-biotech.nstl.gov.cn) and the Center for Global Environmental Research (Japan, www-cger.nies.go.jp), have a specific link to the PICES publications page (www.pices.int/publications/). Many more link to the PICES website (www.pices.int). As Google does not index data contained within library catalogs and literature databases, these results do not reflect organizations providing links to PICES publications from within their organizational databases. There may be similar limitations with regard to the depth of indexing of foreign language sites at google.com versus its foreign language peers.

This breadth of linking suggests the importance of a well organized, current website that encourages usage and stimulates interest. However, the lack of links to the PICES website from Korean, Chinese, and Russian institutions is troublesome. There may be institutional barriers to linking. This is another issue that the PICES membership may be able to address.

Assessing use of PICES Publications

Usage is a significant justification to continue the PICES publications program. Assessing usage, however, is not trivial and has inherent limitations, especially with grey literature (Webster and Collins, 2005). PICES Scientific Reports undergo varying levels of peer and editorial review, but are not recognized as peer-reviewed journals, and thus

do not receive the same level of attention in commercial literature indexes. This limits their exposure and consequent use. With this as an explicit caveat, examining citation patterns can still be a useful indicator of usage by and impact on the scientific community. Other PICES publication series generally undergo even less peer review. Therefore, they are less often found in the commercial literature indexes.

Two indexes, *Web of Science* and *Scopus*, feature tools to assess impact by compiling citation rates to individual publications. *Google Scholar* is beginning to do this, but as yet is not very sophisticated. These tools focus on the peer-reviewed journal literature as their core data. Citations to grey literature appear if that literature is cited within the journal literature. *Web of Science* and *Scopus* were searched for citations to papers in PICES special journal issues as well as any PICES publications such as the Scientific Reports.

Scientific Reports

Considering the “grey” nature of the report series, it is heartening to report that they are cited quite well (Table 4), especially in comparison to other grey literature report series (Cordes, 2002/2003; McDonald, Cordes and Wells, 2007). Eighteen of the first thirty reports are cited at least once in *Web of Science* while twenty-three are cited according to *Scopus*.

Scopus claims to include a broader suite of source publications, hence the higher numbers of citations. The three most cited Scientific Reports are Numbers 2, 6, and 10, and all address the Okhotsk Sea. Perhaps this demonstrates a unique role of PICES in covering a geographic area that was neglected previously in the English language scientific literature. The diminishing number of citations to more recent reports is expected given the lag time for a publication getting into circulation.

Table 4: Number of citations to PICES Scientific Reports in two indexing services

Scientific Report	Web of Science	Scopus
no.1	4	10
no.2	13	61
no.4	1	2
no.5	1	3
no.6	6	36
no.8		1
no.10	11	37
no.12	7	28
no.14	3	7
no.15	13	14
no.16	4	6
no.17	2	1
no.18	3	9
no.19		1
no.20	3	5
no.22	1	1
no.23		2
no.24		2
no.25	2	2
no.26	1	1
no.27		1
no.28	3	3
no.30	2	2
Total	80	235

PICES special issues of primary journals

Citation rates of the special journal issues provide strong validation of the value of publishing in peer-reviewed, commercially published journals. Table 5 shows the total numbers of articles in each issue as well as the number of citations in both *Web of Science* and *Scopus*. Given that most scientific papers are not cited (some say up to 90% (Meho, 2007), these numbers indicate that many PICES sponsored articles are read and used.

Table 5: Citations to PICES Special Issue articles

Special Issue	# of Articles	# of cites in Web of Science	# of cites in Scopus
Prog. in Oceanography 43(2-4) (1999)	11	227	364
Prog. in Oceanography 47(2-4) (2000)	13	75	654
Prog. in Oceanography 49(1-4) (2001)	33	340	495
Journal of Oceanography 58(5) (2002)	12	55	98
Prog. in Oceanography 55(1-2) (2002)	17	123	202
Can. J. Fish. Aquat. Sci. 59(12) (2002)	15	120	159
Deep Sea Res. Part II 49 (24-25) (2002)	28	221	423
Journal of Oceanography 59(4) (2003)	10	78	99
Prog. in Oceanography 57(3-4) (2003)	13	102	N/A
Mar. Environmental Res. 57(1-2) (2004)	10	28	50
Journal of Oceanography 60(1) (2004)	13	85	74
Prog. in Oceanography 61(2-4) (2004)	10	21	28
ICES J. of Marine Science 61(4) (2004)	28	108	125
J. of Marine Systems 50(1-2) 2004)	7	33	41
ICES J. of Marine Science 62(3) (2005)	40	108	246
Deep Sea Res. Part II 52(5-6) (2005)	10	97	31
Prog. in Oceanography 64(2-4) (2005)	14	29	81
Deep Sea Res. Part II 53(3-4) (2006)	13	3	6
Prog. in Oceanography 68(2-4) (2006)	12	15	29
Deep-Sea Res. Part II 53(20-22) (2006)	25	0	1
Ecological Modelling 202(1-2) (2007)	18	70	70
Total number of articles	352		
Total number of citations		1938	3276

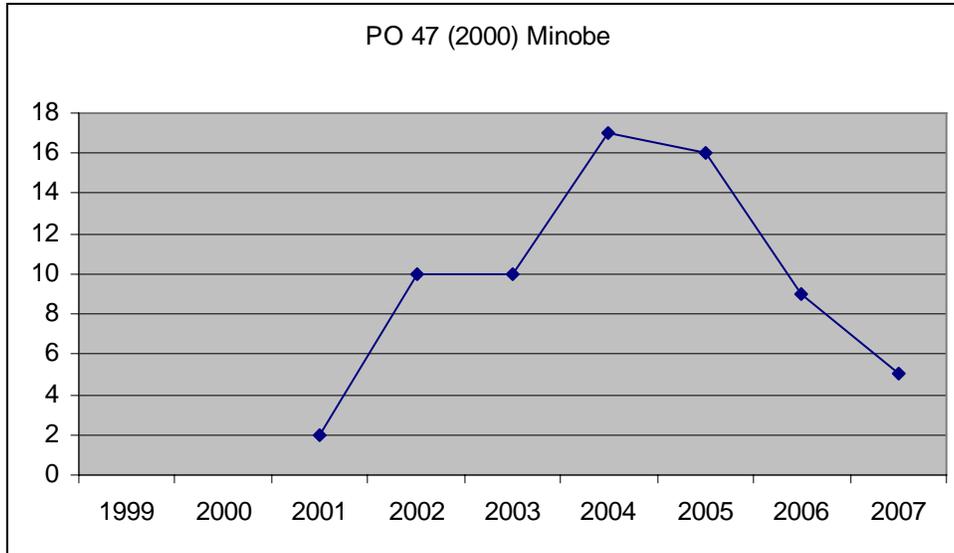
Of course, some articles have more impact than others. Table 6 shows the most heavily cited in each of the special journal issues with older articles having more time to generate additional citations.

Table 6: Most cited PICES journal articles

Article cited	# of citations in <i>Web of Science</i>	# of citations in <i>Scopus</i>
PO 43 (1999) Harrison	83	96
PO 47 (2000) Minobe	54	69
PO 49 (2001) Hollowed	52	50
JO 58 (2002) Whitney	27	29
DSR 49 (2002) Honda	34	50
PO 55 (2002) Hunt	24	26
JO 59 (2003) Yasuda	24	28
PO 57 (2003) Denman	20	N/A
ICES 61 (2004) Heath	12	16
PO 61 (2004) Yamada	9	8
ICES 62 (2005) Rice	20	22
DSR 52 (2005) Whitney	11	9
PO 64 (2005) Tsuda	7	16
PO 68 (2006) Demaster	7	7

Most articles have a classic citation pattern as illustrated by Figure 1 using citations to Minobe's 2000 article.

Figure 1: Web of Science Citations to Minobe 2000



Website usage statistics are another means of assessing usage of publications. While they have a unique set of limitations, they can still provide an indication of the effectiveness of the current digital distribution mechanism. Statistics gathered and provided by Julia Yazvenko, PICES Database and Web Administrator, indicated that over the past three years, PICES Special Publication No.1 (*Marine Ecosystems of the North Pacific*) and Scientific Report No. 23 (*Harmful Algal Blooms in the PICES Region of the North Pacific*) were the most frequently accessed publications on the website. Other frequently accessed publications were Scientific Report No. 22 (*PICES Science: the first ten years and a look to the future*), and Scientific Report No. 16 (*Environmental Assessment of Vancouver Harbour; Data Report for the PICES Practical Workshop*) following No. 23 in popularity.

Other notably popular publications were the Abstract Book from the 13th annual meeting (Honolulu) and *Shark abundance increases in the Gulf of Alaska* in PICES Press (July 2000). Each publication series resides in its own directory on the PICES web server, so by comparing website usage statistics for each directory, it seems that series popularity can be ranked from highest to lowest as follows: Scientific Reports, PICES Press, Special Publications, Annual Reports, Brochures, and Abstract Books. Primary journal special issues are not included in this list because the articles are not available on the PICES website.

Overall, PICES publications contribute to the scientific dialogue. While the journal special issues appear to have more impact on the scientific community, the Scientific Reports are serving an important role as well. Additionally, the PICES book, *Dynamics*

of the Bering Sea, has been cited 128 times according to the *Web of Science*, demonstrating its value. Even articles in *PICES Press* have been cited, as have some annual meeting abstracts. A more thorough analysis of citation patterns is required to ascertain who is using the PICES publications. This may assist with questions of distribution of publications as well as marketing. Also, the data could be used to investigate patterns of international collaboration, another element of the PICES mission. At this point, we can safely say that many PICES publications are used and add value to the science of the North Pacific Ecosystem.

Challenges and Approaches

This review of the PICES publications program illuminates issues with grey literature and exposes some new ones as organizations work to make science more accessible.

Inconsistent indexing

According to citation patterns and website use, all PICES publications are contributing to scientific dialogue, although more consistent and comprehensive indexing in *FFW* and *ASFA* would enhance the visibility of PICES publications. Better indexing in *FFW* is a distribution issue (e.g. incorrect mailing address). *ASFA* presents a more complex issue as publications by non-governmental and inter-governmental organizations are only indexed if the organization is on the official monitoring list. Then, either the commercial contractor, Cambridge Scientific Abstracts (CSA) does the indexing as material is received or the ASFA Secretariat does it as time allows. . The PICES Scientific Reports and the *PICES Press* are indexed selectively by CSA, and consequently can easily fall between the cracks. An alternative for PICES is to become an ASFA partner, index its publications and contribute those records to *ASFA*. This represents a significant amount of staff time in a small organization. An alternative may be spending similar or less time creating simple metadata records and depositing the items in IAMSLIC's Aquatic Commons.

Accessing special issue articles

Partnerships with commercial publishers provide useful access to PICES science for a broader audience. Yet access is limited to those with subscriptions, which are typically expensive for smaller institutions. Access to special issues of primary journals is adequate in the United States and Canada, but may be problematic in other PICES member countries. Access would improve if the rights to store digital copies on both the PICES website and in Aquatic Commons were negotiated.

Archiving of print publications

Print versions of PICES publications are currently collected and archived at several key institutions. Distribution practices could focus on those institutions as well as targeting additional appropriate institutions that have the capacity to archive and provide physical access to PICES print publications.

Improving current awareness of publications

While mailing is used for print distribution, alerting technology is useful for electronic distribution. PICES could easily implement an RSS feed in its web pages and/or an email list as appropriate.

Archiving digital publications

The revision of the PICES website following the 2003 Publication Review was a major step toward increased electronic access to PICES publications. Efforts should be made to convert the remaining publications to searchable PDF format. While available locally, PICES publications should be archived in an open access digital repository, allowing more robust, permanent digital access and archiving.

Branding of PICES as a publisher

It is important to have PICES listed as the publishing or sponsoring body on all of its publications. This increases awareness of PICES in the scientific community as well as among policy makers and the broader media. To accomplish this, PICES should be listed on each publication in a way that it will be entered as a searchable name in literature databases and library catalogs. This will not only increase the visibility of the PICES name within resources used by the scientific community, but will also make an easier task of tracking distribution and archiving.

Creating a new publications vehicle

A PICES journal would be a means of controlling branding, image, and content. While intriguing, especially in the digital environment, it requires significant further investigation on the part of the PICES Secretariat, with both commercial and non-profit publishers, as to the organizational needs to viably market and support a regularly published journal. At this time, working with existing journals achieves some of PICES goals while not placing undue burden on the organization. The continued growth of PICES and the need for more open access suggest that other options should be continually evaluated.

Summary

The PICES Publication program is critical to the mission of PICES as it promotes the organization, encourages international collaboration, and communicates important

science to the world. The possibilities for enhancing PICES publications are many and vary in cost and effort. PICES could be a model for how an organization can embrace open access to its publication and increase its visibility and impact. IAMSLIC is interested in continuing to work with PICES to ensure better access to PICES publications through stable print archiving, targeted distribution, consistent indexing, and improved use of the electronic environment. Five cooperative actions form the base of further work:

1. Create a PICES collection within the IAMSLIC digital repository, *Aquatic Commons*, beginning with the PICES Scientific Reports.
2. Survey those on the PICES libraries distribution list to complete assessment of collection policies.
3. Develop memorandum of understanding with selected libraries on establishment of print archives of PICES publications.
4. Complete the addition of links to electronic versions of PICES publications in existing WorldCat records.
5. Provide assistance developing a copyright statement that is consistent with the goals of PICES' communication strategy

The next steps include a presentation of the report to the PICES Finance and Administration Committee in late October 2007, possible acceptance of a proposed action plan and then activity focused on the action plan. This type of cooperation provides a model for how IAMSLIC can work with other organization to improve access to both the grey and the white literature of marine science.

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Appendix A: Suggestions for survey of PICES and North Pacific IAMS LIC members on library practices

1. How is a given library using their OCLC/IAMSLIC membership? If their holdings are not fully reflected in WorldCat, are they shown in the local catalog? If they have non-lender status in WorldCat, do they offer lending services through other means? If so, to whom?
2. Member symbols can represent one library system with several physical locations or they can represent individual units. If a symbol represents a system with wide geographic range, more research into actual holdings may be necessary to determine actual archive access.
3. Libraries may catalog a series like the Scientific Report series, as one title (the series title) with several volumes or analytically with a separate record for each report in the series. If a library catalogs in the former manner, more research into actual holdings may be necessary to determine actual archive access.
4. While both OCLC and IAMSLIC are open to international membership, the majority of active participation is centered on the North American continent. What is the culture and practice of cataloging and sharing in organizations or countries with little or no OCLC or IAMSLIC membership?
5. Do some PICES Members use library resources and services from other geographically adjacent organizations?
6. Are PICES Members or individuals regularly contributing their distribution copies to accessible collections for use by others within their community?
7. What are the differences between publications in terms of the need for archive access to PICES member/stakeholder readers versus non-stakeholders or the general public?
8. How are links to outside websites determined for an institutional website? Is this a way to increase access to PICES publications?

Appendix B: Condition of libraries at PICES member sites with recommended actions

Summary of Condition:	Recommended action:	PICES Member sites:
Libraries have no or very few identifiable holdings, but may support work of Contracting Parties.	Further inquiry into archiving and access practices warranted.	TINRO, KORDI, Hokkaido University, • Scripps Institute of Oceanography (duplication of holdings with other West Coast U.S. libraries more actively archiving), • Institute for Oceanology Academia Sinica
Libraries have no or very few identifiable holdings. Unlikely to support work of Contracting Parties or other work in the North Pacific. Other libraries in the region do thorough archiving.	Address the option of eliminating distribution copies to these sites	University of British Columbia, University of Alaska Fairbanks, Bedford Institute of Oceanography, National Institute of Water and Atmospheric Research (NIWA)
Reasonable numbers of identifiable library holdings show dedication to archiving and support of PICES research	Continue print distribution and establish MOU to insure dedication to archiving	Oregon State University, University of Washington, NOAA/National Marine Fisheries Service (perhaps a subset of actual library members), Fisheries and Oceans Canada (DFO)(regional distribution needs may require further inquiry)
Libraries have no or very few identifiable holdings, but may support work of Contracting Parties or other work in the North Pacific. Institutional or individual PICES members may be associated with these libraries. Institutions have associated libraries but are not PICES members on the library distribution list. There is generally a regional lack of library holdings.	Address those organizations/libraries to determine their interest in increasing support of PICES research through more active archiving.	Global Carbon Project/Earth Observation Centre, Intergovernmental Oceanographic Commission, International Ocean Carbon Coordination Project, Food and Agriculture Organization of UN