Mapping the Arctic Ocean Fisheries Data Ecosystem: using network science and linked data to enhance data access

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Research Scientist, National Snow and Ice Data Center, University of Colorado

Third Meeting of Scientific Experts on Fish Stocks in the Central Arctic
Northwest Fisheries Science Center
2725 Montlake Boulevard East
Seattle, WA

Dates: April 14– 16 2015

Objectives

- Provide participants of the **3rd Meeting of Scientific Experts on Fish Stocks in the Arctic Ocean** with background information on the IASC-SAON Arctic Data Committee and its activities
- Propose a "straw man" model that outlines how the Arctic fisheries community represented at the meeting could develop an Inventory of Arctic Research and Monitoring Data

Overview of Developments

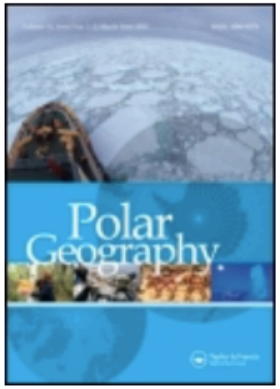
- International Polar Year 2007-09 catalyzed development in the area of polar data management, including expansion of the PDC
- Formal and informal international networks developed
- A series of major meetings/workshops held before during and after IPY (e.g. GeoNorth Yellowknife, IPY OSLO, IPY Montreal, ELOKA Boulder, Polar Data Forum Tokyo)

Minutes of the workshop of the

Arctic Data Coordination Network

IPY 2012, Palais des Congrès, Montréal, Quebéc, Cana

27 April 2012, 13:30-17:00



Polar Geography

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Introduction: local and traditional knowledge and data management in the Arctic

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ng Dr., Eagle River, AK

; Fisheries, Aquaculture,
of Tasmania, Hobart,

SCAR

ICSU WORLD DATA SYSTEM

IASC

International Forum on

Polar Data Activities in Global Data Systems

Communiqué

1 Background

nd draf

Sustaining Arctic Observing Network (SAON)

SAON Data Management Workshop Report

Developing a Strategic Approach

Prepared By:
Gillian B. Lichota, NOAA Arctic Research Program
Simon Wilson, AMAP

June 7-

Data Science Journal, Volume 13, 30 October 2014

TOWARDS AN INTERNATIONAL POLAR DATA COORDINATION NETWORK

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[12]University of Alberta Libraries, University of Alberta, Edmonton, Alberta, T6G 2J8, Canada

ABSTRACT

Data management is integral to sound polar science. Through analysis of documents reporting on meetings of the Arctic data management community, a set of priorities and strategies are identified. These include the need to improve data sharing, make use of existing resources, and better engage stakeholders. Network theory is applied to a preliminary inventory of polar and global data management actors to improve understanding of the emerging community of practice. Under the name the Arctic Data Coordination Network, we propose a model network that can support the community in achieving their goals through improving connectivity between existing actors.

Keywords: Data management, Network, Arctic, Antarctic, International Polar Year, Interoperability, Data sharing

1 INTRODUCTION

Well defined, efficient, and sustainable data management is a prerequisite to moving Arctic observing initiatives from a loose collection of individual projects and missions to a unified observing system advancing a common

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CAR-sponsored science
d to promote the funding

DM Recognized by International Science Bodies

Statement of Principles and Practices for Arctic Data Management
April 16, 2013

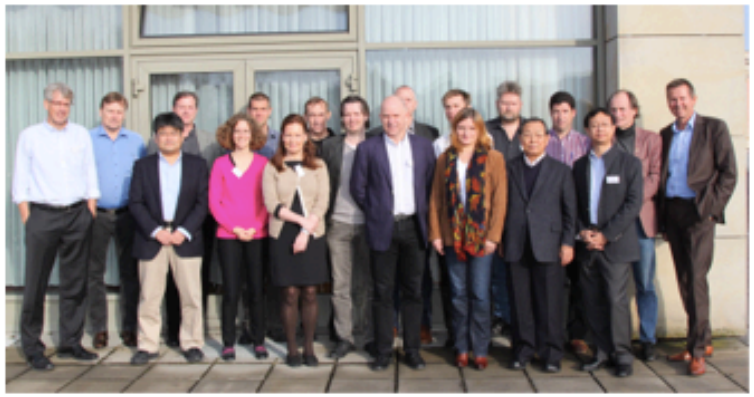
All IASC-endorsed scientific results shall be verifiable and reproducible through ethically open access to all data necessary to produce those results. Data shall be preserved, accessible, and used in accordance with scientific norms of fair attribution and use.

To this end, IASC Council approves the following actions:

1. Endorsement of the Statement of Principles and Practices for Arctic Data Management;
2. Establishment of an IASC Data Standing Committee;
3. To undertake measures towards adoption of national data policies consistent with

Formation of the Arctic Data Committee, Nov. 2014

Report of the 1st Meeting of the Arctic Data Committee



Meeting Details

Meeting: 1st Meeting of the IASC Data Standing Committee (IDSC) and SAON Committee on Data and Information Services (CDIS)

Time: 10 November 2014, 14:00 – 18:00 ; 11 November 08:30 – 13:00 (CET)

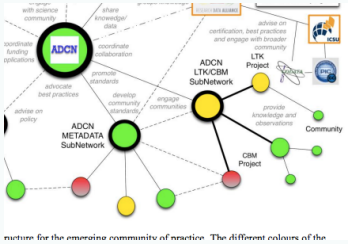
Location:
Mercure Hotel Potsdam City
Lange Brücke
14467 Potsdam
Germany
Room: Studio 1+2.

Confirmation of Key Priorities

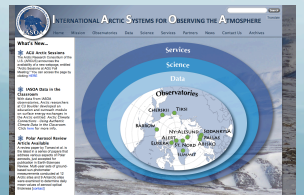
- **Documenting and understanding the Arctic data management ecosystem**
- Identifying common metadata elements
- Engaging in data citation and publication movement
- Promoting interoperability through action – interoperability experiment

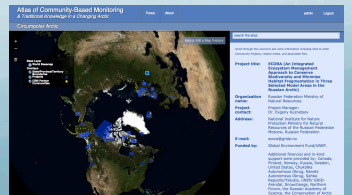
Mapping the Arctic Ocean Fisheries Science Data Ecosystem

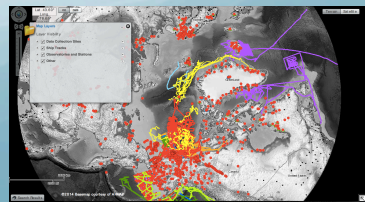
Documenting and understanding the Arctic data management ecosystem



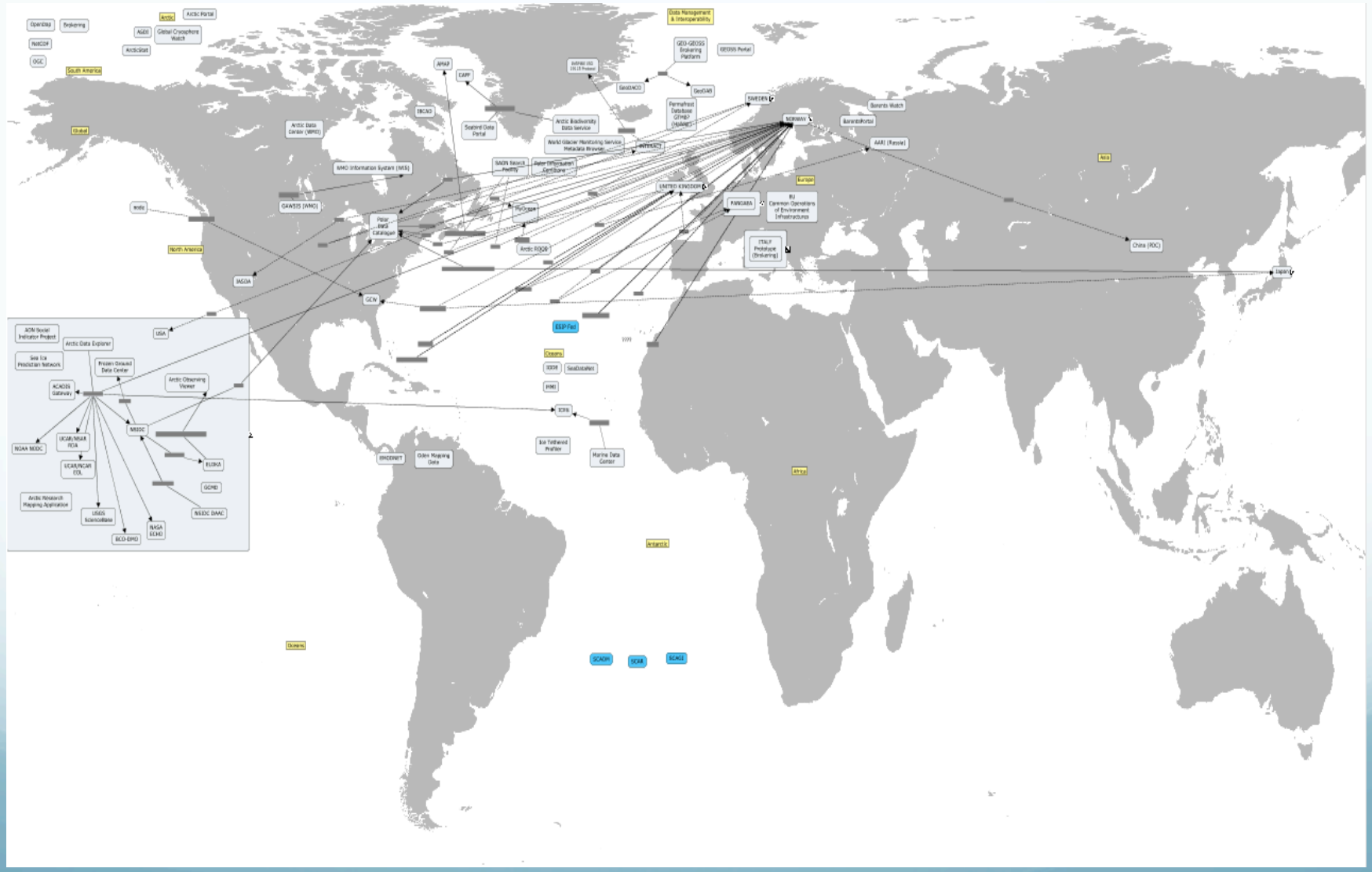
- First work package of ADC
- Network/concept map & geographic map
- Visual product… built on “linked data” database
  - Node (e.g. “data center”) + relationship (e.g. “hosts”) + node (e.g. “data set”)
- Initially use manual methods to build database – over time this can be complemented by (semi-)automatic methods
- Focus on **aggregator nodes** (e.g. IARPC, ADE, IASOA, GTN-P, Arcticcbm.org, AOV etc.)







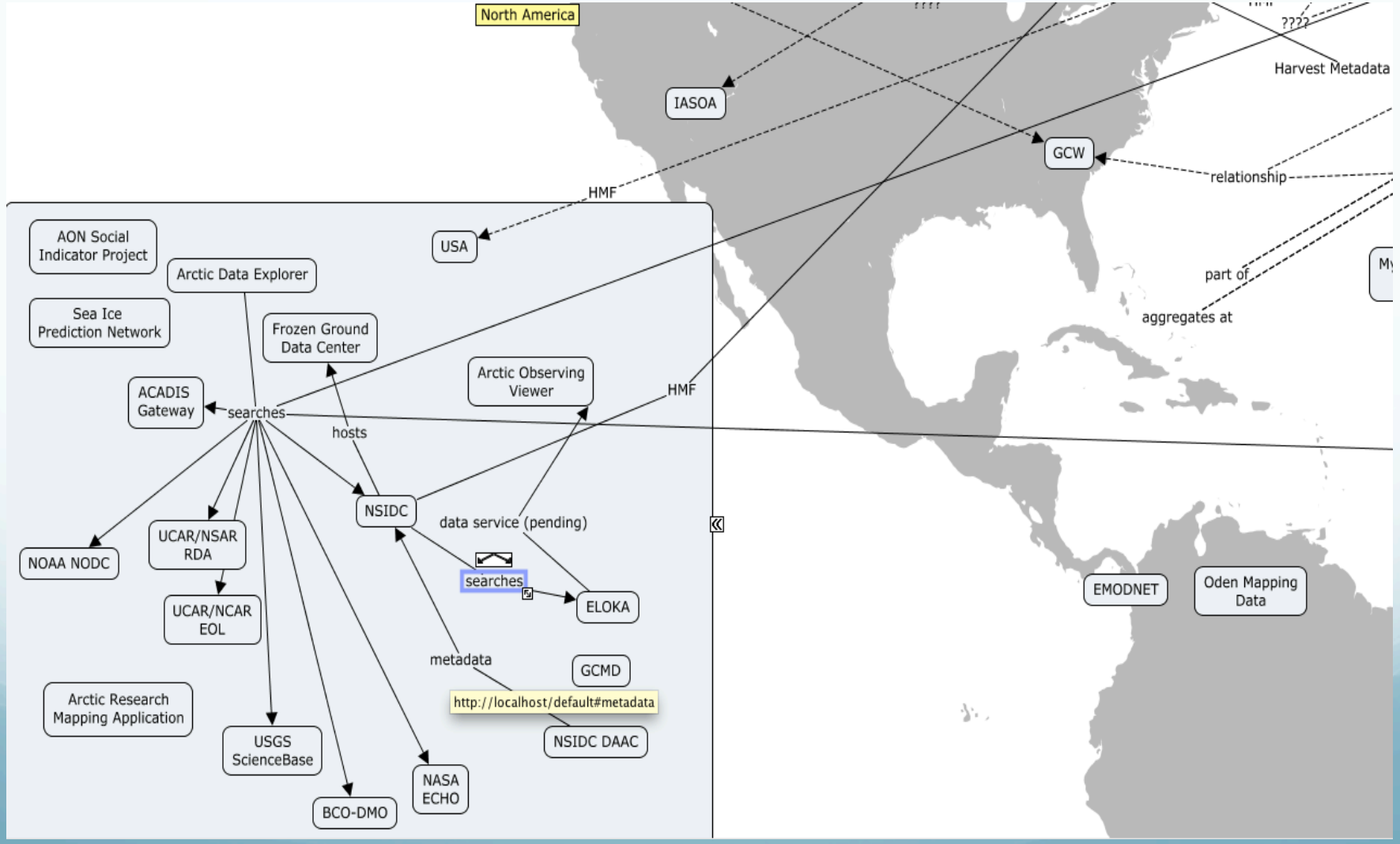
Building the “Map”



Related International Initiatives

- Belmont Forum
  - Arctic Observing and Research for Sustainability Call
  - Six national PIs (Canada, China, Japan, Norway, Russia, US) + partners applied to support DM network
  - E-Infrastructure Data Management Project
- European Commission – Horizon 2020
  - Recently fund EU-PolarNet
- Research Data Alliance, World Data System and other programs well established
- Well established international programs exist and can act as reference: e.g. IODE, SeaDataNet

Complex System

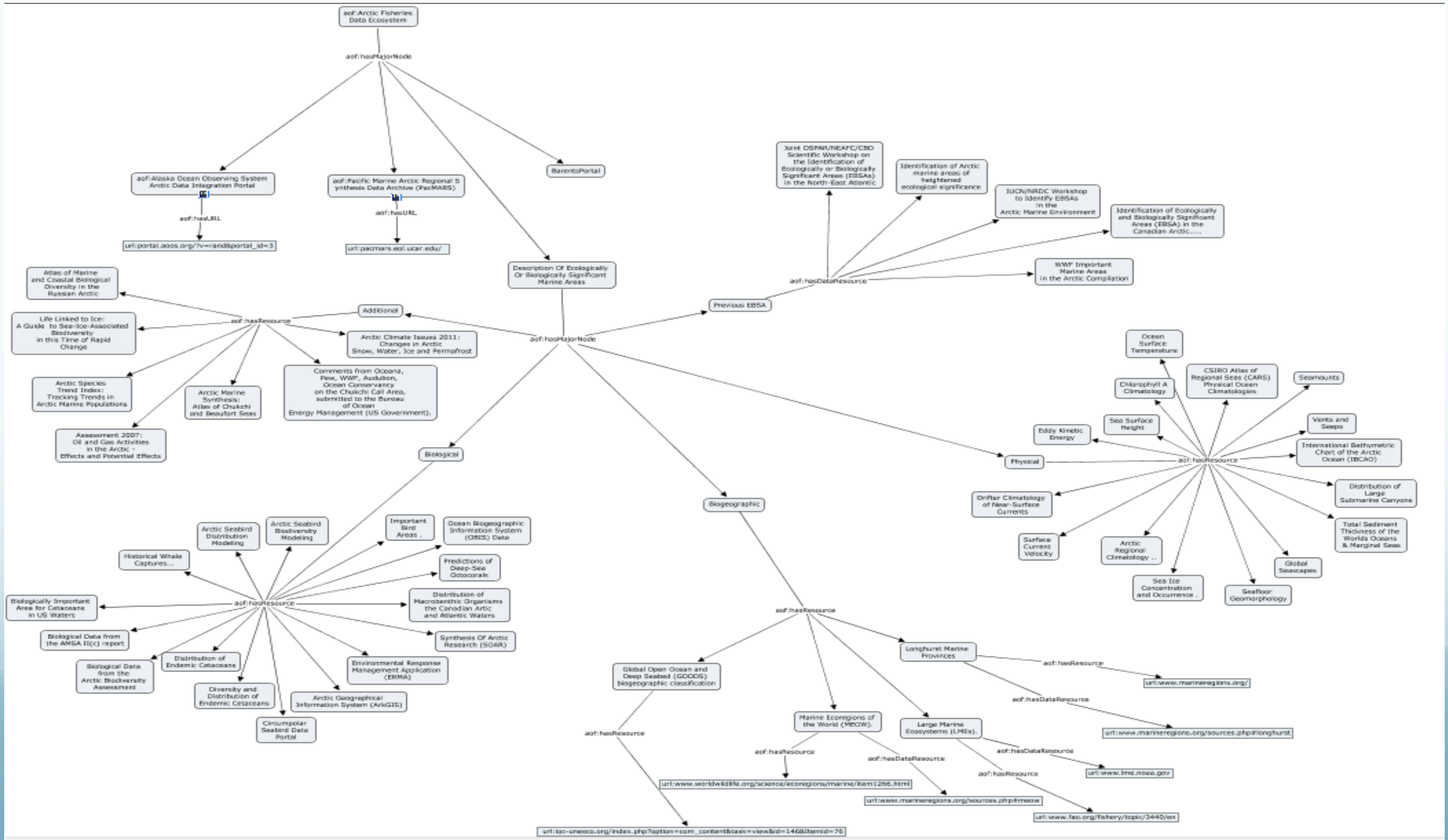


Documenting and Understanding the Arctic Fisheries Science Data Ecosystem

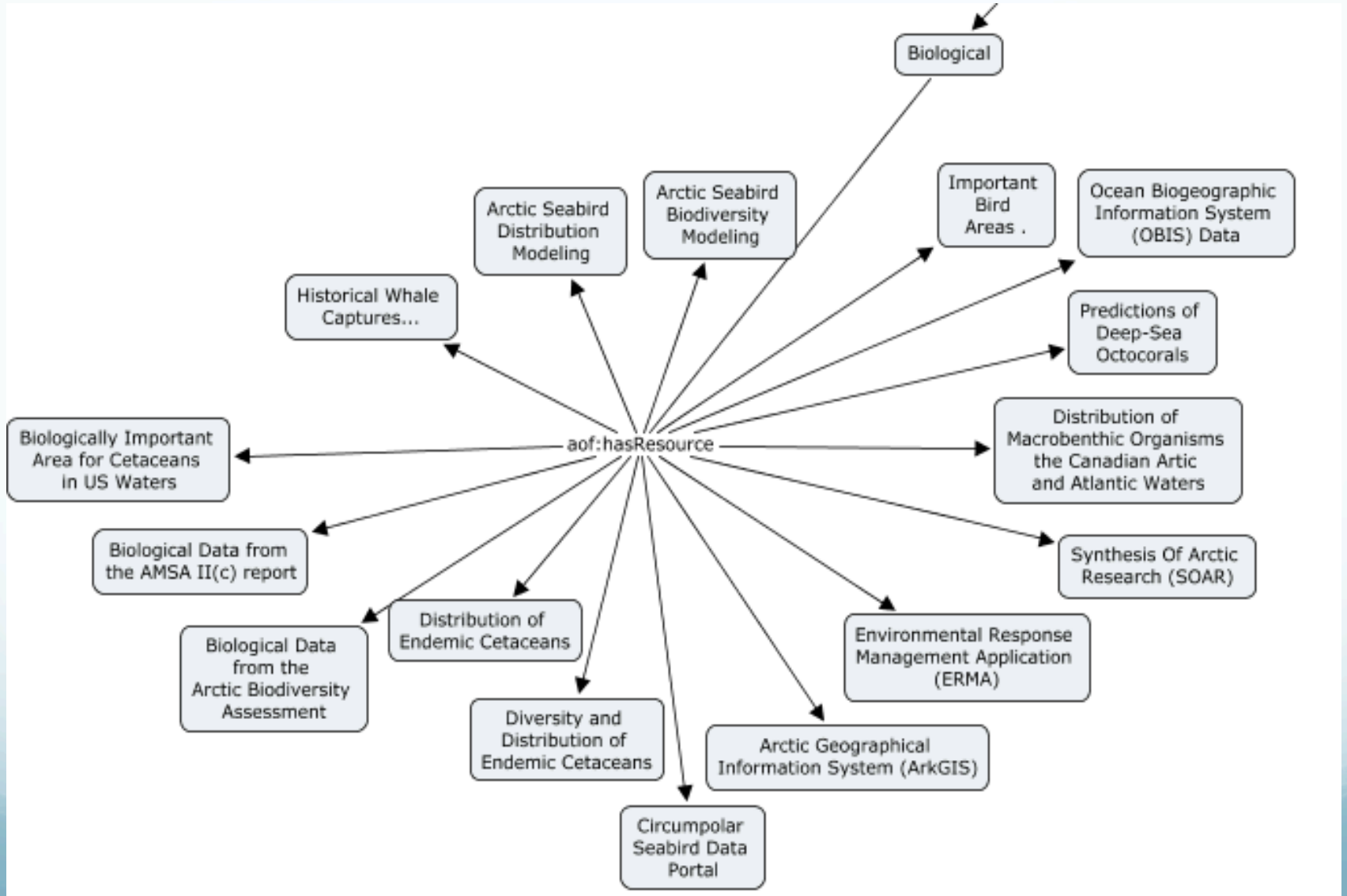
- **Community has already done significant work in identifying relevant data:**
- Alaska Ocean Observing System Arctic Data Integration Portal http://portal.aoos.org/?v=rand&portal_id=3
- Pacific Marine Arctic Regional Synthesis Data Archive (PacMARS) http://pacmars.eol.ucar.edu/
- Data to Inform the Arctic Regional Workshop to Facilitate the Description of Ecologically or Biologically Significant Marine Areas. http://www.cbd.int/doc/meetings/mar/ebsaws-2014-01/official/ebsaws-2014-01-03-en.pdf
- Barents Portal - The joint Norwegian Russian Environmental Status Report for the Barents Sea http://barentsportal.com/barentsportal_v2.5/index.php/en/

Preliminary Map

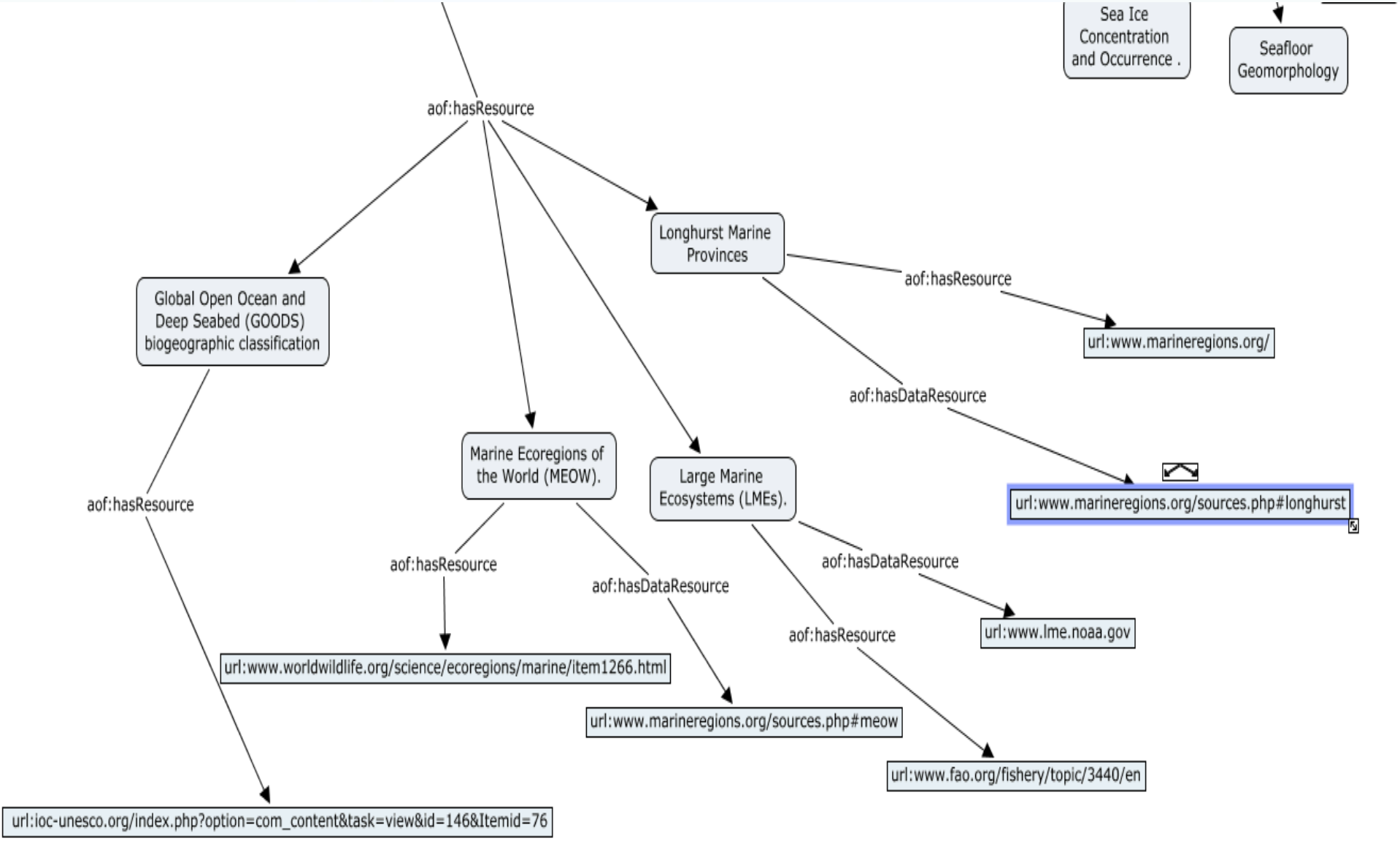
- *Data to Inform the Arctic Regional Workshop to Facilitate the Description of Ecologically or Biologically Significant Marine Areas.*



Preliminary Map



Preliminary Map



Documenting and understanding the Arctic fisheries science data Ecosystem

- *The proposal put forward here is to explore and discuss the possibilities for engaging the Arctic Fisheries community in the broader ADC initiative to map the Arctic data ecosystem to enhance data access.*

  - *COMMENTS?*