IABP/IPAB

International Arctic Buoy Programme (IABP) and International Programme for Antarctic Buoys (IPAB)

http://iabp.apl.washington.edu/index.html

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**Areas of contribution**

Polar atmospheric processes

Oceanic processes

Modelling and forecasting

Polar-lower latitude linkages

Education

Observations

Sea ice processes

Data assimilation

Data archiving

Outreach
Summary

The International Arctic Ocean Buoy Program (IABP) was established in 1978 as an international effort to maintain a network of drifting buoys in the Arctic Ocean. The IABP aims to provide meteorological and oceanographic data for real-time operational requirements and research purposes, including support to the World Climate Research Programme (WCRP) and the World Weather Watch (WWW) Programme. Due to the relatively young history of Antarctic buoys, the IPAB was only recently established, but serves basically the same purpose in the Southern Hemisphere.

Description

The participants of the International Arctic Buoy Programme (IABP) work together to maintain a network of drifting buoys in the Arctic Ocean to provide meteorological and oceanographic data for real-time operational requirements and research purposes including support to the World Climate Research Programme (WCRP) and the World Weather Watch (WWW) Programme.

A network of automatic data buoys to monitor synoptic-scale fields of sea level pressure, surface air temperature, and ice motion throughout the Arctic Ocean was recommended by the U.S. National Academy of Sciences in 1974. Based on the Academy's recommendation, IABP was established by the Polar Science Center (PSC), Applied Physics Laboratory-University of Washington, in 1978 to support the Global Weather Experiment. Operations began in early 1979, and the program continued through 1990 under funding from various agencies. In 1991, the IABP succeeded the Arctic Ocean Buoy Program, but the basic objective remains - to maintain a network of drifting buoys on the Arctic Ocean to provide meteorological and oceanographic data for real-time operational requirements and research purposes including support to the WCRP and the WWW Programme.

In 1990, the National Ice Center (NIC) was designated as the focal operational organization for U.S. buoys on the Arctic Ocean, with responsibility for the overall management and cooperation. The United States contribution to IABP is coordinated through the United States Interagency Arctic Buoy Program (USIABP), which is managed by the National Ice Center (NIC) and the PSC. The USIABP is a collaborative program that draws operating funds and services from a number of U.S. government organizations and research programs. From these contributions the USIABP acquires and deploys buoys on the Arctic Ocean, and supports the Coordination and Data Management for the IABP by the PSC.

In 1991, meetings were held to organize the IABP. A set of Operating Principles were adopted and the IABP became an Action Group of the Drifting Buoy Cooperation Panel, under the World Meteorological Organization (WMO) and the Intergovernmental Oceanographic Commission.

Today, the IABP is composed of 20 different research and operational institutions from 9 different countries. The IABP is funded and managed by Participants of the program. Management of the IABP is the responsibility of the Executive Committee, and operation of the program was delegated to the IABP Coordinator Ignatius Rigor. The primary contribution of the USIABP to the IABP is to support the coordination and data management of the IABP.

Data from the IABP have many uses. For example:
1. Research in Arctic climate and climate change,
2. Forecasting weather and ice conditions,
3. Validation of satellites, 
4. Forcing, validation and assimilation into numerical climate models, and 
5. Tracking the source and fate of samples taken from the ice.
Over 600 publications have benefited from observations from the IABP, and its aims are fully coherent with YOPP.
Many of the dramatic changes in Arctic climate were first observed and studied using data from the IABP, which is analyzed and made available to the community by the PSC. For example, IABP data were fundamental to Walsh et al. (1996) showing that atmospheric pressure has decreased, Rigor et al. (2000) showing that air temperatures have increased, and to Proshutinsky and Johnson (1997); Steele and Boyd, (1998); Kwok, (2000); and Rigor et al. (2002) showing that the clockwise circulation of sea ice and the ocean has weakened. Data from the IABP has also been assimilated into the global temperature data sets (e.g. Jones et al., 1999). All of these results relied heavily on IABP data. And, as such, maintaining and enhancing the IABP has been identified as a priority for the Study of Environmental Arctic Change (SEARCH).

The IPAB was only recently founded as IABP's Southern counterpart, to coordinate and extend buoy activities in the Antarctic. The purposes of the buoy data in the Antarctic are essentially the same as in the Arctic. However, due to the limited number of deployments so far in the Antarctic, a (data) infrastructure compared to the already established IABP has not been set up yet, but is planned.

Timeline
2015-01-01 - 2030-01-25

User relevant aspects

Information is exchanged during annual meetings, which are open to everyone.

Provider relevant aspects

Information is exchanged during annual meetings, which are open to everyone. Planned activities are also summarized on the IABP website.

Regional emphasis

Northern hemisphere: Yes
Southern hemisphere: Yes
Key project deliverables

- Maintain an observational network over the Arctic Ocean using data buoys;
- Provide meteorological, sea ice and oceanographic data and buoy location from the network for distribution in real time over the Global Telecommunication System (GTS) of the WMO and provide relevant additional real-time data approved for public dissemination;
- Ensure data from the network are archived;
- Develop and distribute basic analyzed products;
- Cooperate with and provide results of the Programme to the WCRP/SCAR International Programme for Antarctic Buoys and other related programmes, such as the Sustaining Arctic Observing Networks, International Arctic Science Committee; and
- Promote the use of Programme data and products.

Data management

All buoys in the network should be equipped with transmitters to enable transmission of data in real-time using satellite telemetry such as Argos, and Iridium. Participants are required to provide appropriate metadata to Joint WMO/Intergovernmental Oceanographic Commission (IOC) Technical Commission for Oceanography and Marine Meteorology (JCOMM) Observation Program Support (OPS). A metadata template may be obtained from JCOMM-OPS. All data transmitted on the GTS will be archived by the Integrated Science Data Management (ISDM, formerly Marine Environmental Data Services) of the Canadian Department of Fisheries and Oceans as the Responsible National Oceanographic Data Centre (RNODC) for Drifting Buoys of the JCOMM. A uniform, quality-controlled Programme data base has been established at the Polar Science Center, University of Washington for use by the research community, and is maintained by the Coordinator. Periodically these data will be submitted to International Council for Scientific Unions (ICSU) World Data System and to ISDM.

Is data provided to WMO Global Telecommunication System

Yes

Real-time provision

Participants are responsible to code appropriate data and buoy location in approved WMO code(s) and required to distribute data onto the Global Telecommunication System in real-time.

Other information

Project start: 1978; Project end: --.
## Timelines

<table>
<thead>
<tr>
<th>Location</th>
<th>Latitude</th>
<th>Longitude</th>
<th>Start Date</th>
<th>End Date</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arctic Ocean (IABP)</td>
<td>0</td>
<td>0</td>
<td>2015-01-01</td>
<td>2025-12-25</td>
<td>Buoy deployments in all regions of the Arctic Ocean from a large number of participants and vessels. (Start and End date: annually)</td>
</tr>
<tr>
<td>Southern Ocean (IPAB)</td>
<td>0</td>
<td>0</td>
<td>2015-01-01</td>
<td>2025-12-25</td>
<td>Buoy deployments in several regions of the Southern Ocean (mainly Weddell Sea and Ross Sea) from several participating institutes and vessels. (Start and End date: annually)</td>
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