



Letter of Intent (LOI) to Enhance Support for the International Comprehensive Ocean-Atmosphere Data Set (ICOADS) Program through International Partnership, 1 December 2013

The International Comprehensive Ocean-Atmosphere Data Set (ICOADS) is an invaluable international resource, providing secure and traceable access to a comprehensive archive of surface marine climate data. The ICOADS archive underpins a wide range of activities including regional and international climate monitoring and assessments; atmospheric, ocean and coupled reanalyses; and calibration and validation of measurements from satellites. By exploiting existing capabilities amongst principal partner organizations, we anticipate being able to accelerate development of ICOADS, and ensure its long-term sustainability.

The purpose of this Letter of Intent (LOI) is to define the conditions under which the partner organizations intend to pursue cooperation and collaboration toward the goal of continuing development and improvement of ICOADS, and to more formally recognize existing and planned international contributions that build on the ongoing investment in ICOADS by the National Oceanic and Atmospheric Administration (NOAA) and National Center for Atmospheric Research (NCAR), which is managed by the University Corporation for Atmospheric Research (UCAR), as the founding US partners. The collaboration is expected to improve the resilience of ICOADS to any short-term fluctuations in national budgets.

The commitment to ICOADS is expected to be long-term and will be reviewed after five years (see paragraph 7 below). By signing, partners agree to work closely with the common goal of enhancing and internationalizing ICOADS, including the near-term goal of completing the next major delayed-mode update, Release 3.0. This partnership also is anticipated to facilitate possible future formalization of ICOADS as a Centre for Marine-Meteorological and Oceanographic Climate Data (CMOC) under the WMO (World Meteorological Organization)-IOC (Intergovernmental Oceanographic Commission) Marine Climate Data System (MCDS).

1. Principal and contributing (indented) partner organizations (hereafter “the partner organizations”; see the Annex for further background on each) are:

- a. National Oceanic and Atmospheric Administration (NOAA) National Climatic Data Center (NCDC; Lead), USA
- b. Cooperative Institute for Research in Environmental Sciences (CIRES), University of Colorado, USA (involved primarily through NCDC)
- c. University Corporation for Atmospheric Research (UCAR), acting on behalf of the National Center for Atmospheric Research (NCAR), USA
- d. Deutscher Wetterdienst (DWD)
 - e. Center for Earth System Research and Sustainability (CEN), University of Hamburg, Germany (involved primarily through DWD)
- f. UK Met Office
 - g. Climatic Research Unit (CRU), University of East Anglia (UEA) (involved primarily through the Met Office)
- h. UK National Oceanography Centre (NOC)

2. The partner organizations intend to pursue cooperation and collaboration on the rescue, digitization, assembly, processing, quality control (QC), and archival of surface marine meteorological and oceanographic data, for the express purpose of making such data openly and freely available. This availability will be accomplished primarily through the joint completion and issuance of major new ICOADS Releases, and intermediate products, together with their accompanying technical documentation and journal publications. By working more closely together, the partner organizations further intend to pursue specific collaboration areas including the following:

- a. NCDC: Lead responsibility for ICOADS development and archiving the observational data and products; contributing responsibility for development of the ICOADS value-added database (IVAD), and provision of data access services.
- b. CIRES: Contributing responsibilities under NCDC’s role, including ICOADS program management advisory expertise.
- c. NCAR: Lead responsibility for data access services, including hosting the IVAD database management system; contributing responsibility for preparing and archiving the observational data and products.
- d. DWD: Rescue and provision of historical data and metadata, provision of operational data and metadata (both real-time and delayed-mode through GCC responsibility), higher-level QC processing, mirroring (e.g. of data access services), satellite data calibration/match-up.
- e. CEN: Contributing responsibilities under DWD’s role, including rescue and provision of historical hydrographic data and metadata, data QC processing, translation of research outputs to quantitatively assess historical data quality, QC of marine cryosphere data.
- f. Met Office: Rescue and provision of historical data and metadata (in association with the International Atmospheric Circulation Reconstructions over the Earth [ACRE] Initiative), provision of operational data and

- metadata (both real-time, and delayed-mode through GCC responsibility), data translations, QC enhancements, mirroring (e.g. of permanent archival functions).
- g. CRU: Contributing responsibilities for exploration and assessment, in collaboration with the Met Office and the ACRE initiative, of worldwide historical ship logbook collections.
 - h. NOC: Provision of observational metadata and translation of research outputs to improve observational data quality
3. The partner organizations intend to meet on a periodic basis (minimum of bi-annually) either in-person or via teleconference. Such meetings could include (but not be limited to) the presentation and discussion of possible new tasks and their prioritization; cooperation on identifying partner-specific experts for each task; and facilitation of expanded international cooperation.
4. This LOI directs solely the cooperative efforts documented and is not a vehicle for, or an obligation on any of the partner organizations, involving funding or other resources. This LOI has no legal or other standing with respect to funding or other resources. The program will capitalize on existing and planned activities among the partner organizations and other contributing organizations including e.g. Florida State University (FSU; USA) and Alfred-Wegener Institute for Polar and Marine Research (AWI; Germany). Closer partnership is anticipated to result in more efficient use of existing resources and provide a focus for additional funding in the future.
5. If any organization is unable to continue their participation in this partnership, they may terminate their participation upon thirty (30) days notice to the other partner organizations.
6. The resources required for these data stewardship and access activities will be discussed as part of the cooperation facilitated by this LOI, but without obligation. Any specific tasks that the partner organizations decide to pursue that involve the commitment of resources will be described, in detail, in subsequent written agreements.
7. This LOI will be effective upon signature by all parties. It is valid for five (5) years from the date of the last signature and can be renewed for further periods.

Letter of Intent (LOI) to Enhance Support for the International Comprehensive Ocean-Atmosphere
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Name: Thomas R. Karl
Position: Director, NOAA National Climatic Data Center

SIGNED
(On behalf of Director, NCDC)



Date: 28 March 2014


Letter of Intent (LOI) to Enhance Support for the International Comprehensive Ocean-Atmosphere
Data Set (ICOADS) Program through International Partnership, 1 December 2013

Name: Waleed Abdalati

Position: Director, Cooperative Institute for Research in Environmental Sciences

SIGNED

(On behalf of Director, CIRES)

 Date: 2/11/14

Letter of Intent (LOI) to Enhance Support for the International Comprehensive Ocean-Atmosphere
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Name: Dr. James Hurrell
Position: Director, National Center for Atmospheric Research

SIGNED
(On behalf of Director NCAR)

 Date: 2/14/14

Name: Beverly J. Broach
Position: Contract Administrator, University Corporation for Atmospheric
Research

SIGNED
(On behalf of UCAR)

 Date: 2/18/14

Letter of Intent (LOI) to Enhance Support for the International Comprehensive Ocean-Atmosphere
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Name: Prof. Dr. Gerhard Adrian
Position: President, Deutscher Wetterdienst

SIGNED
(On behalf of President, DWD)

Gerhard Adrian Date: 4.2.2014

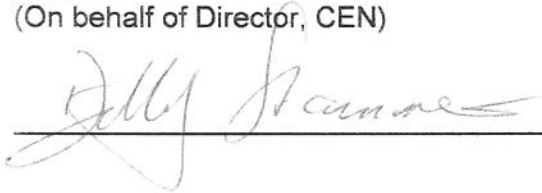
Letter of Intent (LOI) to Enhance Support for the International Comprehensive Ocean-Atmosphere
Data Set (ICOADS) Program through International Partnership, 1 December 2013

Name: Detlef Stammer

Position: Director, Center for Earth System Research and Sustainability (CEN),
University of Hamburg

SIGNED

(On behalf of Director, CEN)



Date: Feb. 20 2014

Letter of Intent (LOI) to Enhance Support for the International Comprehensive Ocean-Atmosphere
Data Set (ICOADS) Program through International Partnership, 1 December 2013

Name: Professor Julia Slingo
Position: Chief Scientist

SIGNED
(On behalf of Met Office Chief Scientist)

J. M. Slingo

Date: 3 April 2014

Name: Professor Phil Jones

Position: Director of Research, Climatic Research Unit (CRU), University of East
Anglia

SIGNED

(On behalf of Director of Research, CRU)



Date: 10 February 2014

Letter of Intent (LOI) to Enhance Support for the International Comprehensive Ocean-Atmosphere
Data Set (ICODAS) Program through International Partnership, 1 December 2013

Name: Professor Ian Wright
Position: Director, Science and Technology, National Oceanography Centre

SIGNED
(On behalf of Director Science and Technology, NOC)

 _____ Date: 11/2/2014

Annex: Further Background on Partner Organizations

a. *NOAA's National Climatic Data Center (NCDC; <http://www.ncdc.noaa.gov>) (main facility in Asheville, NC USA)*: NCDC maintains the world's largest climate data archive and provides climatological services and data to every sector of the US economy and to users worldwide. Records in the archive range from paleoclimatic data to centuries-old journals to data less than an hour old. NCDC's mission is to preserve these data and make them available to the public, business, industry, government, and researchers. NCDC develops national and global datasets, which are used to maximize the use of climatic and natural resources while also minimizing the risks caused by climate variability and weather extremes. Within NCDC, the World Data Center (WDC) is an international environmental data center serving as a member of the International Council for Science (ICSU) World Data System (WDS), and recognizing the value of free and open access to environmental data on a global basis.

b. *Cooperative Institute for Research in Environmental Sciences (CIRES; <http://cires.colorado.edu/>) (Boulder CO USA)*: As a world leader in Environmental Sciences, CIRES is committed to identifying and pursuing innovative research in Earth System Science and fostering public awareness of these processes to ensure a sustainable future environment. CIRES is dedicated to fundamental and interdisciplinary research targeted at all aspects of Earth System Science and to communicating these findings to the global scientific community, to decision-makers, and to the public.

c. *National Center for Atmospheric Research (NCAR; <http://ncar.ucar.edu>) (main facility in Boulder, CO USA)*: NCAR is a federally funded research and development center devoted to service, research and education in the atmospheric and related sciences. NCAR's mission is to understand the behavior of the atmosphere and related physical, biological and social systems; to support, enhance and extend the capabilities of the university community and the broader scientific community—nationally and internationally; and to foster transfer of knowledge and technology for the betterment of life on Earth. The National Science Foundation is NCAR's primary sponsor, with significant additional support provided by other US government agencies, other national governments and the private sector.

d. *Deutscher Wetterdienst (DWD; <http://www.dwd.de>) (main facility in Offenbach, Germany)*: As Germany's National Meteorological Service, DWD is responsible for meeting meteorological requirements arising from all areas of economy and society—including atmospheric weather forecasting models run on DWD's supercomputer. DWD is an operational and scientific agency that monitors weather and meteorological conditions over Germany and worldwide. It offers all sorts of weather and climate services for the general public as well as specific services e.g. maritime and agricultural. In addition, DWD is responsible for managing Germany's national climate archive. This includes rescuing, HQC and archiving of worldwide marine meteorological data. It hosts one (UK the other) of the two GCCs for marine climatological data under JCOMM.

e. *The Center for Earth Systems Research and Sustainability (CEN; <http://www.cen.uni-hamburg.de/>) (main facility in Hamburg, Germany)*: CEN combines the expertise of a number of institutes and units of the University. Its members include meteorologists, oceanographers, marine biologists, geophysicists, geologists, soil scientists, geographers and biogeochemists. At the same time, CEN is a part of the KlimaCampus

Hamburg, formed by the University together with the Max Planck Institute for Meteorology, the Helmholtz-Zentrum Geesthacht and the German Climate Computing Centre. The member institutes and research units develop the research program of CEN. The focus is on basic and applied aspects: • What are the interrelationships between the ocean, the atmosphere and the geosphere? • How has our earth system changed? To what degree can future developments be predicted? • What is the state of marine and terrestrial ecosystems? What changes can be expected? • What socio-economic effects will accompany global change?

f. Met Office (<http://www.metoffice.gov.uk>) (main facility in Exeter, UK): The Met Office is the UK's National Weather Service, and a longstanding world leader in providing weather and climate services, and recognized as one of the world's most accurate weather forecasters, using more than 10 million weather observations a day, an advanced atmospheric model and a high performance supercomputer to create 3,000 tailored forecasts and briefings a day. These are delivered to a huge range of customers from UK government, to businesses, the general public, armed forces, and other organizations. Through its close linkages with the International Atmospheric Circulation Reconstructions over the Earth (ACRE) Initiative, the Met Office also brings into the partnership a major international body with an ongoing program of recovery, imaging and digitization of masses of historical global surface weather observations, that is regularly contributing the marine component of that data directly into ICOADS. In addition, the Met Office coordinates QC and facilitates international exchange of marine data through hosting one (Germany the other) of the two GCCs for marine climatological data under JCOMM.

g. Climatic Research Unit (CRU; <http://www.cru.uea.ac.uk/home>) (Norwich, UK): CRU at the University of East Anglia (UEA) has over 35 years of extensive experience in the analysis of climate data. CRU jointly produces with the UK Met Office Hadley Centre the well-known datasets of global surface temperatures (HadCRUT4 and CRUTEM4—see www.cru.uea.ac.uk/cru/data/temperature), as well as many other climatic variables (www.cru.uea.ac.uk/data). CRU has been involved in a number of studies on the analysis of long instrumental records with particular emphasis on extremes, as well as the development of long homogeneous series not only within Britain, but also in other parts of Europe.

h. National Oceanography Centre (NOC; <http://noc.ac.uk>) (UK): NOC is the Natural Environment Research Council's (NERC) centre of excellence for oceanographic sciences, with a remit to provide leadership and national capability in the marine sciences—from coast to deep-ocean. NOC's basic mission is two-fold: (i) Undertake internationally competitive marine science in an Earth system context and especially with a long-term focus—working with others for the effective translation of new and existing knowledge into demonstrably high societal benefit. (ii) Manage, develop, coordinate and innovate high quality, large research infrastructure, equipment pools, facilities, databases and other science enabling functions for the benefit of the whole UK science community to deliver excellent science with impact.