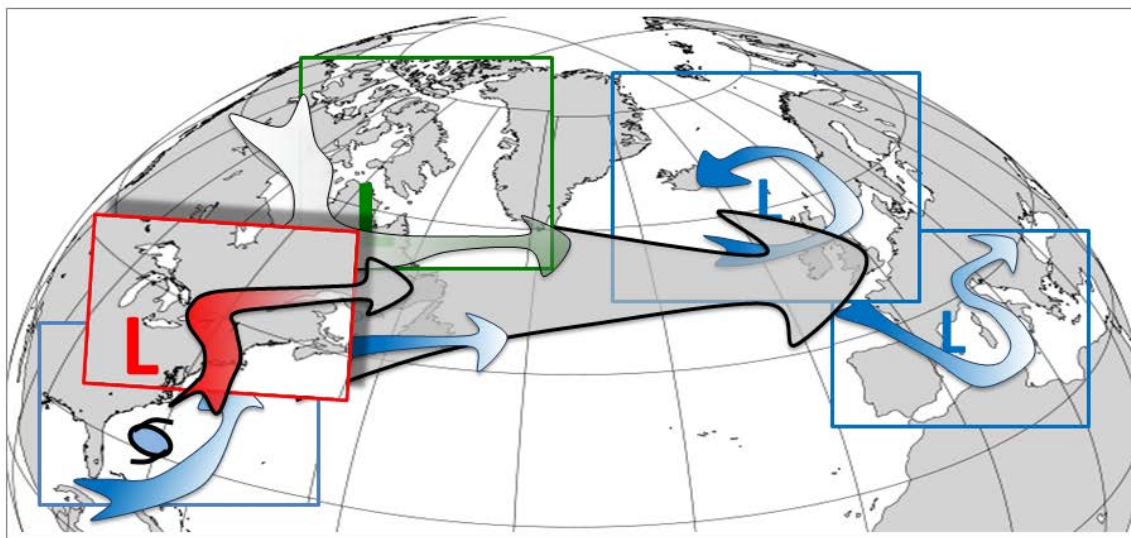


Data protocol



for data measured onboard
HALO (High Altitude and Long Range Research Aircraft)
during the

NAWDEX

North Atlantic Waveguide
and Downstream Impact Experiment



Preamble

NAWDEX aims at locating and quantifying errors in the numerical representation of midlatitude Rossby waves and weather systems that are related to diabatic processes. Therefore remote sensing and in-situ measurements on board HALO were carried out to obtain a comprehensive picture of the thermodynamic and flow structure near midlatitude jet streams and to quantify the impact of diabatic processes for the weather evolution over Europe. NAWDEX aimed at observing the physical processes that are responsible for the triggering and modification, propagation and downstream impact of Rossby waves on a trans-Atlantic scale over several days.

The participants of the HALO measurement activities during the North Atlantic Waveguide and Downstream Impact Experiment campaign (NAWDEX)—in the remainder of this document these aircraft activities during this campaign will be referred to as *the mission*—agree on this data protocol.

This data protocol aims:

1. to ensure the fair use of the data,
2. to encourage the rapid dissemination of the scientific results,
3. to uphold the rights of the individual scientists,
4. to ensure the visibility and the integrity of the project,
5. to have all involved researchers treated equitably,
6. to encourage an orderly and timely analysis and publication of the data, and
7. to produce a central repository of the data to be released to the public domain.

This data protocol formulates common scientific practice related to data that has been collected in a joint effort by many scientists, as it has established in the field of atmospheric science for many decades.

§ 1 Definitions

In this document the term *principal investigator of the mission*—also called *Mission PI* or *PI of the mission*—refers to a person that is a member of the *data steering group* of the mission. This data steering group includes PIs from the following organizations:

- George Craig (MIM, LMU Munich)
- Andreas Schäfler (IPA, DLR Oberpfaffenhofen)
- Heini Wernli (IAC, ETH Zurich, Switzerland)
- Jim Doyle (NRL Monterey): permanent non-voting guest

A *principal investigator of an instrument*—also called *Instrument PI* or *PI of an Instrument*—is a person in charge of a scientific instrument. A *principal investigator of a model* is a person in charge of a scientific model.

The term *participant of the mission* refers to a person that is a member of the institutions that mainly contributed to the HALO flight activities during NAWDEX, subscribed this document and was granted membership to the mission by the data steering group of the mission.



Members of the following institutions are considered to get access to the data as participants of the mission:

- DLR Oberpfaffenhoffen, Institute of Atmospheric Physics (IPA)
- Karlsruhe Institute of Technology (KIT)
- Ludwig-Maximilians-Universität München (LMU)
- Max Planck Institute for Meteorology Hamburg (MPI-M)
- Swiss Federal Institute of Technology in Zurich (ETHZ)
- Universität Hamburg
- Universität Köln
- Universität Leipzig
- Universität Mainz

The term *quicklook* refers to a visualization of preliminary data that is produced shortly after the respective data set was created.

§ 2 Data management

(1) Data ownership: Data shall be property of the owner of the instrument which the data was created with.

(2) Data repository: The repository for the data of the mission is the HALO-database operated by the *Institute of Atmospheric Physics* of the DLR.

(3) Citation of data: Reference to a persistent identifier such as a digital object identifier (DOI) shall be applied to the data and/or parts of it.

(4) Data format: The participants must provide the data in standard scientific data formats such as the NASA-Ames format or the NetCDF format. The usage of standard names for the observed entities according to the CF convention is encouraged.

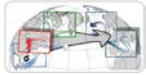
(5) Data quality: The analysis of the scientific data should conform to the *rules of good scientific practice* defined by the Deutsche Forschungsgemeinschaft (DFG). In particular, the analysis procedures must be transparently documented and the scientific data and the documentation necessary to understand the data must be stored for at least 10 years. Preservation of the data beyond 10 years is encouraged.

§ 3 Provision of Data/Data licensing and sharing

The NAWDEX community supports an open use of the data and collaborations among interested scientific communities. The following rules for provision of data/data licensing and sharing should provide guidelines for the smooth exchange of data.

(1) Provision of data: The data of the individual scientific instruments along with the corresponding documentation to understand the data shall be made available to all participants as soon as possible. The data should contain qualifiers of the status of the analysis (preliminary, final, etc.). Corrections and amendments to preliminary data must be made available to all participants as soon as possible. Within **6 months** after the observations are taken (by April 2017), all instrument PI's should report the status of the data and the planned time for the data delivery to the data steering group. A delivery of the data and the documentation within **12 months** (by October 2017) at the latest is desired.

(2) Data licensing and sharing: The NAWDEX community as represented by the data steering group described in §1 reserves the right to have an overview of the data usage until the end of the first **18 months** after the end of the mission (until April 2018). During this time data is available to all



participants of the mission. Regular data and science workshops will be held, where the NAWDEX participants report on their work and discuss possible collaborations. The participants commit to inform the data steering group about the preparation of scientific articles. The coordination of data usage in the interest of all NAWDEX participants through the data steering group is intended to guarantee the right of the NAWDEX community to first publish the data. The data steering group is the point of contact in case of overlaps of scientific interests or other conflicts as described in §8.

Collaborations with scientists outside the HALO-NAWDEX community are welcome. An individual scientist wishing to collaborate (*associated scientist*) can apply to get access to the data of interest. The associated scientist must provide a short written description of her/his aims to the data steering group of the mission described in § 1. This will be considered by the data steering group of the mission and access to the data will be granted after approval by the respective instrument PI.

During the period of time as set forth in this paragraph any publication or forwarding of data to public, non-participants of the mission or non-associated scientists is prohibited. After the expiration of the period of time set forth in this paragraph § 3 (3) shall apply.

(3) After the period of time set forth in § 3 (2) the PI of an instrument must decide if the data, created with the instrument he/she is responsible for, shall be released to individual persons or to the public by one of the following options:

closed: A potential data user can request the data of the instrument by contacting the respective Instrument PI. The data can be made available to that person under the conditions defined in the agreement in Appendix A at the end of this data protocol. This agreement has to be signed by this person and returned to the respective Instrument PI. The final decision to share or not to share the data with that person remains by the respective Instrument PI.

or

open: The data is made public available under a suitable open license such as one of the Creative Commons licenses as recommended by the *Allianz der deutschen Wissenschaftsorganisationen*, see Appendix B and C.

In either case the receiver(s) of the data are obliged to accept the provisions as stipulated in §§ 4 et seq.

§ 4 Model studies

(1) Model results: Results of model studies using data of the mission must be made available to the participants as soon as possible.

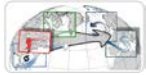
(2) Corrections: Corrections and amendments to preliminary results must be communicated to the participants of the mission as soon as possible.

(3) Recent version of data: The principal investigator of a model must ensure that the data used in the modeling study is the best available at that time.

§ 5 Publications/Conference Contributions/Public meetings

Note that the following rules are to be applied in a manner consistent with the *rules of good scientific practice* defined by the Deutsche Forschungsgemeinschaft (DFG).

(1) Co-authorship: If data of the mission is used for publications (ex: scientific articles), digital media, conference contributions and/or in public meetings the lead author has to offer co-authorship to the instrument PI.



(2) Right to refuse: In justified cases (e.g., wrong interpretation of measurements) the instrument PI has the right to refuse the usage of the data in publications, conference contributions and/or in public/meetings.

(3) Co-authors: The manuscript for any journal publication must be sent to the co-authors at least 3 weeks before submission with a copy to the data steering group of the mission.

Abstracts to contributions to conferences and/or public meetings must be sent to the co-authors at least 1 week before submission with a copy to the data steering group of the mission.

The lead author has to take into account substantial comments from the co-authors before the submission of the manuscript or abstract. The co-authors and the data steering group of the mission shall be kept informed of the further progress of the review and publication.

(4) Usage of data: The lead author must have the explicit agreement of the instrument PI(s) for the usage of the data in publications, conference contributions and/or public meetings.

(5) Recent version of data: The PI of an instrument must ensure that the data of this instrument used in publications, conference contributions and/or public meetings is the best available at that time.

(6) Acknowledgement: The mission must be acknowledged in a suitable way.

§ 6 Press releases

(1) Publications and/or press releases where the mission itself is the main subject—so called overview articles—must be approved by all PIs of the mission and all PIs of the instruments before submission.

(2) Press releases relating to data, created during a mission, must be approved by the instrument PI(s) of the data.

§ 7 Collaborations

Effective and productive collaborations between the participants of the mission and other projects are encouraged.

§ 8 Avoidance of disputes

(1) Any disputes about the use of the data in particular with respect to publications will be resolved by the data steering group of the mission and approved by the instrument PIs.

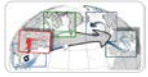
(2) During the periods defined in § 3, when the data is still not public, it is encouraged to hold scientific meetings on a regular basis where all participants of the mission can present their ongoing work and their plans for future work with the data of the mission. This shall be made to avoid redundant work and parallel efforts which are both sources of potential disputes.

§ 9 Constraints

National and international laws or regulations might constrain the agreements of this data protocol.

In that case the data steering group of the mission has to inform the instrument PIs about those constraints. The data steering group of the mission and the instrument PIs shall find a mutual solution on a case-by-case basis.

The undersigned agrees to the conditions of the data protocol.



Signature of participant:

Date, place:

Name:

Position (PI, post-doc, student, etc.):

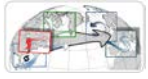
Address:

E-mail:

The data steering group of the mission grants the membership of the mission.

Signature of a representative of the data steering group of the mission:

Date, place:



Appendix A

Agreement to receive the data of an instrument that was licensed according to §§ 2 and 3

(closed version)

I will receive a copy of a HALO data set of the mission North Atlantic Waveguide and Downstream Impact Experiment

I agree to the provisions stipulated in the Data protocol of the mission „North Atlantic Waveguide and Downstream Impact Experiment“ and the following common principle:

“If data of the mission is used for a publication, conference contribution and/or public meeting, co-authorship has to be offered to the instrument PI(s) of the data.”

I will not distribute this data set or parts of it.

Signature of the receiver of the data set:

Date, place:

Name:

Affiliation and address:

E-mail: