

Addendum I

NASA - NOAA COOPERATIVE AGREEMENT

EARLY-EOSDIS PATHFINDER DATA SET ACTIVITY

I. BACKGROUND

It is essential that important, scientifically validated data sets of "research/climate quality" for Global Change research be cataloged and readily available, at minimum cost, to the research community. Because these include NOAA data sets as well as EOS and other NASA data sets, it is highly desirable that NOAA and NASA data and information systems that provide access to these data sets evolve toward full interoperability.

High volume Level 1 data sets must be available in a form that facilitates production of higher level, derived geophysical products. Since the science algorithms will continue to be perfected, it is expected that production of high level derived products from Level 1 data sets will be performed a number of times, adding to the urgency of transferring these data sets to readily accessible working storage.

NASA and NOAA will cooperate to ensure that, to the maximum extent possible, the NASA EOSDIS and NOAA data and information systems achieve full interoperability in the EOS era. The agencies agree to take near term steps, starting in FY90 and FY91, to build toward this interoperability, by developing EOSDIS prototype data sets that will support the immediate science objectives of making Global Change related data sets readily accessible.

This addendum constitutes an implementation level agreement under the "Memorandum of Understanding between NASA and NOAA for Earth Observations Remotely Sensed Data Processing, Distribution, Archiving, and Related Science Support."

NOAA and NASA have at this time identified three existing NOAA data sets as "Pathfinder" data sets for this activity. These are the Advanced Very High Resolution Radiometer (AVHRR) data held by NOAA, TIROS Operational Vertical Sounder (TOVS) data held jointly by NOAA and NASA, and GOES data held under NOAA contract by the University of Wisconsin. Additional data

sets, which could include non-satellite, or in-situ, data, may be selected as Pathfinders, as agreed upon by NASA and NOAA.

EOSDIS prototype product generation, and data archive and distribution functions (Early-EOSDIS Version 0), and corresponding functions in NOAA, will be involved in accomplishing the dual goals of meeting science objectives and beginning the cooperative evolution of interoperability between NASA and NOAA data and information systems.

Under this agreement, it is expected that both NOAA and NASA will be involved in production of new derived Pathfinder products from the Level 1 Pathfinder data sets. These products will be Level 2 or higher Pathfinder products, as agreed to by a NASA/NOAA science working group. NASA will fund production of those new, Pathfinder derived products it generates, including production of a copy for NOAA. NOAA will fund production of those new, Pathfinder derived products it generates, including production of a copy for NASA. NASA and NOAA will separately fund the production of new derived products (Level 2 and higher) developed outside this agreement.

Separate sections of this agreement covering the handling of each of these data sets will be discussed, but all will accomplish these objectives:

1. Place the Level 1 archive on a readily accessible working storage medium, and ensure that it is safely stored and maintained.
2. Involve scientists from the agencies and academia in the definition of community-consensus derived products and in the development of plans to generate and, with user participation, to quality-control and validate these Pathfinder products.
3. Generate and validate the Pathfinder derived products, and make these readily accessible, with supporting meta-data and an efficient means for browsing.
4. Provide valuable learning experience in the application of long time series, large volume, data sets to climate and global change research.
5. All Pathfinder derived products produced by this effort using community consensus algorithms will be called joint

NOAA-NASA products and will be publicly attributed as such.

II. COMMON PATHFINDER ACTIVITIES

Various Pathfinder activities which are applicable to each of the presently defined data sets are described here. Data set specific tasks and requirements are described in the next section.

1. NOAA and NASA agree to form Science Working Groups (SWGs) for each Pathfinder data set. Each SWG will be supported jointly by NASA and NOAA, and will be chaired by Earth scientists from the academic community (agreed to by NASA and NOAA), who are experienced with a specific Pathfinder data set. Each SWG will include scientists from NASA, NOAA, and other agencies and representatives as deemed necessary to achieve proper representation within the SWG. The Pathfinder SWGs are expected to be formed and to begin activities by December 1990.

Each SWG will:

- a. Determine the scientific needs for Pathfinder data, and how these needs translate into specific products, identify community consensus algorithms for producing them, and determine the requirements for the Level 1 data required to generate these products.
 - b. Recommend how these products are to be generated, validated, and stored and maintained, and what data services are required by users (including catalog, browse, and data access).
 - c. Provide a report to NASA and NOAA documenting the results of their work by a date to be mutually agreed upon.
2. In principle, NASA and NOAA agree that under this Pathfinder effort NASA will make available to NOAA hardware, software and technical assistance in exchange for access to Level 1 NOAA data.
3. NOAA will consider operational implementation of the community consensus algorithms for routine production of the derived products as NOAA operational products.
4. Under this agreement, NOAA will provide, at no cost, Level 1 data from a designated start date ending with the life of the sensor, or January 1994,

whichever comes sooner. After January 1994, which corresponds to the planned start date for NASA's Early-EOSDIS system-wide functionality, NOAA will continue to provide Level 1 data to EOSDIS, at no cost, as part of its Operational Active Archive responsibilities, throughout the life of the sensor, or until the launch of EOS-A.

5. NASA will make available upgrades to equipment provided to NOAA for copying Pathfinder data, in parallel with comparable upgrades to corresponding NASA systems, throughout the life of the sensor, or until the launch of EOS-A.

III. SPECIFIC PATHFINDER ACTIVITIES

This agreement will initially address the three data sets listed above. Future data sets, which could include non-satellite or in-situ data, will be handled in the manner to which the agencies agree.

The first three NOAA-NASA Pathfinder Data Sets are:

1. GOES

The Pathfinder data set includes Level 1 Visible Infrared Spin Scan Radiometer (VISSR) and VAS (VISSR Atmospheric Sounder) data, and possible new derived products, from the present series of GOES satellites, starting with data from 1978 held for NOAA by the University of Wisconsin. Post GOES-7 data (GOES-I) will be addressed subsequently. The Level 1 data are presently resident on a medium which is deteriorating, adding urgency to accomplishing this effort. The scope of this effort will include planning and accomplishing the transfer of the GOES data to a new medium, and production of new community consensus derived products.

The University of Wisconsin and NOAA will document the nature, application of calibration, earth location, etc. of the archived Level 1 data, and will study alternatives for archive and/or working storage media, and processing of the Level 1 data during data transfer to new media. This information will be provided to the SWG.

The SWG will develop consensus recommendations regarding the content of the archive and specific Pathfinder derived products. In FY92, with the concurrence of NASA and NOAA, the production/transfer of Level 1 data to a

new archive/working storage medium and the generation of derived products will be initiated at the appropriate location(s).

Support:

NOAA and NASA agree to each provide \$100K in FY91 for preparatory studies and the activities of the GOES SWG. Depending on the availability of resources, significant funding will be provided beginning in FY92, with the actual amount dependent on the results of the Wisconsin/NOAA and SWG activities.

In principle, NASA will contribute toward the implementation of equipment (hardware/software) needed to transfer the GOES data to a new medium, generate new meta-data, browse products, and derived products, and provide for interoperability with EOSDIS, while NOAA will fund implementation (except for the NASA contribution) and operations involved, including providing to NASA a copy of the Pathfinder derived products.

2. AVHRR

The initial AVHRR Pathfinder data set includes global day and night Global Area Coverage (GAC) Level 1 data from the 5 channel radiometers on both NOAA-series satellites, beginning in 1981. NOAA, at its National Climatic Data Center (NCDC), currently holds these data on archive quality media, but media which do not facilitate reprocessing of higher level geophysical products. The effort will transfer the data to readily accessible working storage and produce new Pathfinder derived products based on SWG activities.

Work with AVHRR Local Area Coverage (LAC) data is outside the scope of this effort, and may be considered at a later date.

NOAA and NASA agree that GSFC and NCDC will cooperate in the transfer of the AVHRR target data set to a new working storage medium consistent with the recommendations of the SWG.

a. NASA/GSFC will make available the people, the equipment, and the working storage medium required to copy the backlog data set.

b. NOAA/NCDC will make available access to the data, and assistance in staging data for copying.

c. Three copies of the data set will be produced, one to remain at NOAA/NCDC, one to go to NASA/GSFC, and the third to be provided to USGS/EDC.

d. NASA will make available to NOAA equipment (hardware/software) needed to continue production of copies at NCDC (i.e. to read data from NOAA archive magnetic media and write it to the working storage medium and vice versa). NASA will make available upgrades to this system in parallel with comparable upgrades to the corresponding NASA system.

e. Once the equipment has been made available to NOAA, NCDC will continue to copy incoming data for NASA, providing the copies to GSFC as they are made and without charge to NASA.

GSFC and NCDC will develop a plan to begin this effort as soon as possible.

Once the SWGs have developed consensus recommendations regarding specific products, NASA and NOAA will initiate the generation and validation of agreed-upon products. Meta-data and browse products will be produced. The products will be stored on the same working storage medium. Copies of the products and supporting information will be exchanged among agencies.

Support:

NASA will provide funding in FY91 for the system needed to copy the AVHRR data to a working storage medium and for the start of the copying operation. NASA and NOAA will fund the SWG effort.

NASA will provide funding in FY91 (and FY92 as needed) to complete the backlog copying operation.

NOAA will assume responsibility for funding continuation of the copying operation once the system is in place.

3. TOVS

The targeted TOVS Pathfinder data set is global TOVS (HIRS, MSU, and SSU) Level 1 data set, starting with the TIROS-N/NOAA series in 1978. These data are resident at NOAA and, in part, at NASA/GSFC, on archive quality media, but media which do not facilitate reprocessing of higher level geophysical products. This activity includes development of a plan for improving the accessibility of TOVS Level 1 data and definition and production of

community consensus derived products from TOVS data. The SWG will draw from the NASA funded EOS/AIRS (Atmospheric Infrared Sounder) Facility Instrument team, which includes NOAA, NASA, and academic community members. Additional members may be included in the SWG, as agreed upon.

With the plan for the AVHRR Pathfinder data set as a model, NASA/GSFC and NOAA/NCDC will develop a plan for placing existing TOVS data on readily accessible working storage, including recommending a working storage medium and a plan for accomplishing the copying of data to the new medium.

Once the SWG has developed consensus recommendations regarding specific products, and a plan for the Level 1 data is developed by NASA and NOAA, copying of Level 1 data and generation and validation of derived products will be initiated. Meta-data and browse products will be produced. Copies of products and supporting information will be exchanged among agencies.

Support:

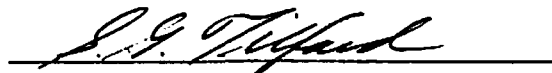
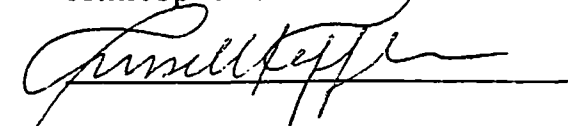
In principle and pending the results of the work of the SWG and GSFC/NCDC efforts, NOAA and NASA agree that NASA will fund copying of the existing TOVS data to the working storage medium, providing NOAA with a copy, and will make available to NOAA the equipment needed to continue the copying; and that NOAA will provide a copy of the continuing TOVS data set to NASA at no charge.

IV. MANAGEMENT AND COORDINATION

Responsibility for implementing the provisions of this addendum are assigned to NASA and NOAA points of contact to be designated by the agencies.

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