Sally K. Ride Papers - Climate Change Committees /Speeches [including a few by Ride]

Extracted on Apr-23-2024 01:24:16

The Smithsonian Institution thanks all digital volunteers that transcribed and reviewed this material. Your work enriches Smithsonian collections, making them available to anyone with an interest in using them.

V. GLOBAL STANDARDS FOR OBSERVING SYSTEMS GLOBAL INFORMATION SYSTEM TEST (GIST)

Introduction

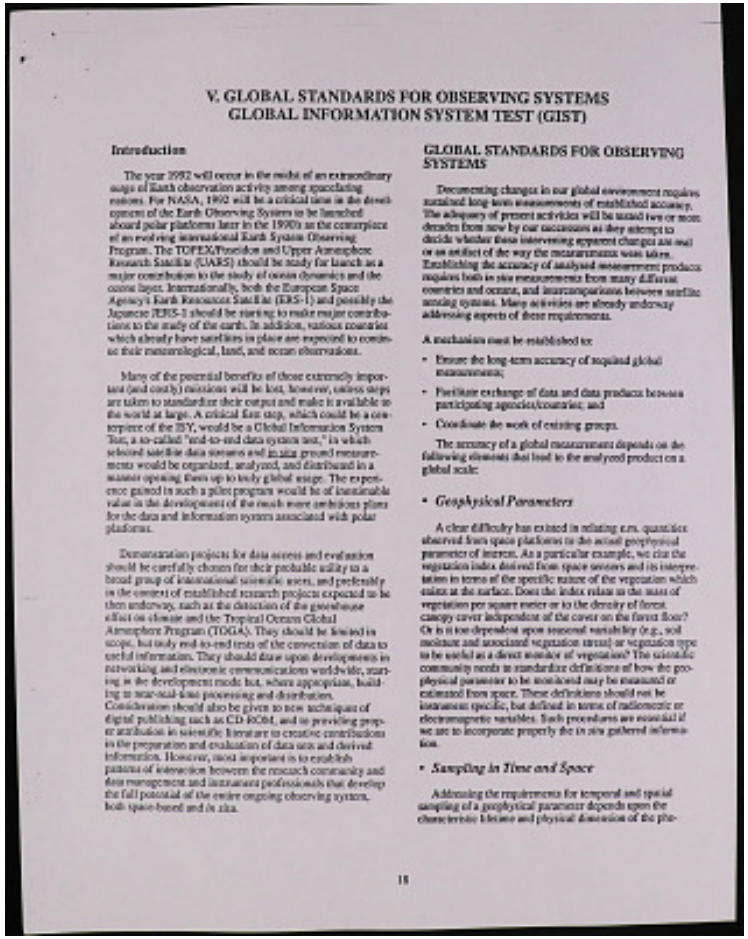
In year 1992 will occur in the midst of an extraordinary surge of Earth observation activity among spacefaring nations. For NASA, 1992 will be a critical time in the development of the Earth Observing System to be launched aboard polar platforms later in the 1990's as the centerpiece of an evolving international Earth System Observing Program. The TOPEX/Poseidon and Upper Atmosphere Research Satellite (UARS) should be ready for launch as a major contribution to the study of ocean dynamics and the ozone layer. Internationally, both the European Space Agency's Earth Resources Satellite (ERS-1) and possibly the Japanese JERS-1 should be starting to make major contributions to the study of the earth. In addition, various countries which already have satellites in place are expected to continue their meteorological, land, and ocean observations.

Many of the potential benefits of those extremely important (and costly) missions will be lost, however, unless steps are taken to standardize their output and make it available to the world at large. A critical first step, which could be a centerpiece of the ISY, would be a Global Information System Test, a so-called "end-to-end data system test," in which selected satellite data streams and [[underlined]]in situ [[/underlined]] ground measurements would be organized, analyzed, and distributed in a manner opening them up to truly global usage. The experience gained in such a pilot program would be inestimable value in the development of the much more ambitious plans for the data and information system associated with polar platforms.

Demonstration projects for data access and evaluation should be carefully chosen for their probable utility to a broad group of international scientific users, and preferably in the context of established research projects expected to be then underway, such as the detection of the greenhouse effect on climate and the Tropical Oceans Global Atmosphere Program (TOGA). They should be limited in scope, but truly end-to-end tests of the conversion of data to useful information. They should draw upon developments, in networking and electronic communications worldwide, starting in the development mode but, where appropriate, building to near-real-time processing and distribution. Consideration should also be given to new techniques of digital publishing such as CD-ROM, and to providing proper attribution in scientific literature to creative contributions in the preparation and evaluation of data sets and derived information. However, most important is to establish patterns of interaction between the research community and the full potential of the entire ongoing observing system, both space-based and [[italicized]] in situ [[/italicized]].

GLOBAL STANDARDS FOR OBSERVING SYSTEMS

Documenting changes on our global environment requires sustained long-term measurements of established accuracy. The adequacy of present activities will be tested by two or more decades from now by our successors as they attempt to decide whether these intervening apparent changes are real or an artifact of the way the measurements were taken. Establishing the accuracy of analyzed measurement products requires both [[italicized]] in situ [[/italicized]] measurements from many different countries and oceans, and intercomparisons between satellite sensing systems. Many activities are already



V. GLOBAL STANDARDS FOR OBSERVING SYSTEMS
GLOBAL INFORMATION SYSTEM TEST (GIST)

Introduction

The year 1992 will occur in the midst of an extraordinary surge of Earth observation activity among spacefaring nations. For NASA, 1992 will be a critical time in the development of the Earth Observing System to be launched aboard polar platforms later in the 1990's as the centerpiece of an evolving international Earth System Observing Program. The TOPEX/Poseidon and Upper Atmosphere Research Satellite (UARS) should be ready for launch as a major contribution to the study of ocean dynamics and the ozone layer. Internationally, both the European Space Agency's Earth Resources Satellite (ERS-1) and possibly the Japanese JERS-1 should be starting to make major contributions to the study of the earth. In addition, various countries which already have satellites in place are expected to continue their meteorological, land, and ocean observations.

Many of the potential benefits of those extremely important (and costly) missions will be lost, however, unless steps are taken to standardize their output and make it available to the world at large. A critical first step, which could be a centerpiece of the ISY, would be a Global Information System Test, a so-called "end-to-end data system test," in which selected satellite data streams and in situ ground measurements would be organized, analyzed, and distributed in a manner opening them up to truly global usage. The experience gained in such a pilot program would be of inestimable value in the development of the much more ambitious plans for the data and information system associated with polar platforms.

Demonstration projects for data access and evaluation should be carefully chosen for their probable utility to a broad group of international scientific users, and preferably in the context of established research projects expected to be then underway, such as the detection of the greenhouse effect on climate and the Tropical Oceans Global Atmosphere Program (TOGA). They should be limited in scope, but truly end-to-end tests of the conversion of data to useful information. They should draw upon developments in networking and electronic communications worldwide, starting in the development mode but, where appropriate, building to near-real-time processing and distribution. Consideration should also be given to new techniques of digital publishing such as CD-ROM, and to providing proper attribution in scientific literature to creative contributions in the preparation and evaluation of data sets and derived information. However, most important is to establish patterns of interaction between the research community and the full potential of the entire ongoing observing system, both space-based and in situ.

GLOBAL STANDARDS FOR OBSERVING SYSTEMS

Documenting changes in our global environment requires sustained long-term measurements of established accuracy. The adequacy of present activities will be tested two or more decades from now by our successors as they attempt to decide whether these intervening apparent changes are real or an artifact of the way the measurements were taken. Establishing the accuracy of analyzed measurement products requires both in situ measurements from many different countries and oceans, and intercomparisons between satellite sensing systems. Many activities are already addressing aspects of these requirements.

A mechanism must be established to:

- Ensure the long-term accuracy of required global measurements;
- Facilitate exchange of data and data products between participating agencies/countries; and
- Coordinate the work of existing groups.

The accuracy of a global measurement depends on the following elements that lead to the analyzed product on a global scale:

- *Geophysical Parameters*

A clear difficulty has existed in relating e.m. quantities observed from space platforms to the actual geophysical parameter of interest. As a particular example, we cite the vegetation index derived from space sensors and its interpretation in terms of the specific nature of the vegetation which exists at the surface. Does the index relate to the mass of vegetation per square meter or to the density of forest canopy cover independent of the cover on the forest floor? Or is it too dependent upon seasonal variability (e.g., soil moisture and associated vegetation stress) or vegetation type to be useful as a direct measure of vegetation? The scientific community needs to standardize definitions of how the geophysical parameter to be monitored may be measured or estimated from space. These definitions should not be instrument specific, but defined in terms of radiometric or electromagnetic variables. Such procedures are essential if we are to incorporate properly the in situ gathered information.

- *Sampling in Time and Space*

Addressing the requirements for temporal and spatial sampling of a geophysical parameter depends upon the characteristic climate and physical dimension of the phe-

18

underway addressing aspects of these requirements.

A mechanism must be established to:

[[bullet point]] Ensure the long-term accuracy of required global measurements;

[[bullet point]] Facilitate exchange of data and date products between participating agencies/countries; and

[[bullet point]] Coordinate the work of existing groups.

The accuracy of a global measurement depends on the following elements that lead to the analyzed product on a global scale:

[[bullet point]] [[italicized]] Geophysical Parameters [[/italicized]]

A clear difficulty has existed in relating e.m. quantities observed from space platforms to the actual geophysical parameter of interest. As a particular example, we cite the vegetation index derived from space sensors and its interpretation in terms of the specific nature of the vegetation which exists at the surface. Does the index relate to the mass of vegetation per square meter or to the density of forest canopy cover independent of the cover on the forest floor? Or is it too dependent upon seasonal variability (e.g., soil moisture and associated vegetation stress) or vegetation type to be useful as a direct monitor of vegetation? The scientific community needs to standardize definitions of how the geophysical parameter to be monitored may be measured or estimated from space. These definitions should not be instrument specific, but defined in terms of radiometric or electromagnetic variables. Such procedures are essential of we are to incorporate properly the [[italicized]] in situ [[/italicized]] gathered information.

[[bullet point]] [[italicized]] Sampling in Time and Space [[/italicized]]

Addressing the requirements for temporal and spatial sampling of a geophysical parameter depends upon the characteristic lifetime and physical dimension of the phenomenom