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A Description of Procedures and Findings Related to the Report of the U.S. Environmental Task Force

The Environmental Task Force (ETF) was formed in the spring of 1992, following discussions between then-Senator Al Gore and Robert Gates, the Director of Central Intelligence (DCI). Vice President Gore maintains a continuing interest in the work of the Task Force, now under the supervision of DCI, R. James Woolsey. The ETF was created to determine the potential application of classified systems and data to expand and enhance environmental studies. Classified holdings of the Intelligence Community, Department of Defense, and Department of Energy were reviewed for relevance to national, regional, and global environmental issues. Over 70 cleared scientists from the academic, private, and government sectors participated in the review.

The ETF scientists were organized into ten panels. Seven of these were based on environmental disciplines:

- Clouds, Radiation, Water Vapor, and Precipitation;
- Land Use, Population Dynamics, and Economic and Urban Development;
- Land Cover and Primary Productivity;
- Geology and Earth Science, including Volcanoes and Their Role in Climate Change;
- Polar Ice Sheets, Permafrost, and Sea Level;
- Greenhouse Gases and Their Atmospheric Transformations;
- Ocean Productivity, Circulation, and Air-Sea Exchange.

The remaining three groups were focused on the following issues:

-Sensor Characteristics: Links Between Sensors and Science.

- Data Systems - What Scientists Do with Data.

-Environmental Applications (this group included, among others, such as the National Oceanic and Atmospheric Administration, the Environmental Protection Agency, the Department of Agriculture, and the Coast Guard)

In particular, personnel from several agencies involved in the interagency U.S. Global Change Research Program (USGCRP) were key participants in the ETF from the outset. The USGCRP is the Federal program designed to produce a predictive understanding of the Earth System in order to support national and international policymaking activities across a broad spectrum of global, national, and regional environmental issues. The inclusion of these individuals was to ensure that any positive results from the review be incorporated in a seamless and cost-effective manner into the broader U.S. environmental research program.

The first meeting of the ETF was held in October 1992. It looked at environmental science data needs without reference to possible data sources. The ETF scientists met with a substantial number of colleagues from the U.S. scientific community. In open forum they compiled a list of critical issues and information needs in their respective fields. For example, the Greenhouse Gases group identified ozone as a critical issue. Associated data needs included measurement of the vertical distribution of ozone as a function of season and latitude, with sufficient accuracy to detect a five percent change in 10 years. In this way, the needs of the environmental science community were communicated to representatives of the classified community.

Based on the needs specified by the environmental scientists, the intelligence, defense, and energy communities prepared a series of briefings on over 100 classified systems and data sets. These were presented to ETF scientists in November 1992, January 1993, and March 1993. Based on these presentations, the panels evaluated the utility of the classified systems and data sets to environmental science. They also recommended that a series of experiments be conducted, to firmly establish the utility of classified information where such utility was suspected, but not demonstrated. In the spring of 1993, the scientists drafted an interim report; Vice President Gore was briefed on the findings of the ETF in September, 1993, and a final report was published in December 1993. All reports are classified.

The ETF found that imagery from intelligence satellites can provide information of value to understanding critical environmental processes. At this time, however, no decisions have been made regarding the release of any of the data collected by these satellites. That task falls to separate bodies, which are charged with weighing the (scientific and resource management) benefits and (national security) costs of releasing classified information, and making recommendations on this matter to the Director of Central Intelligence. The efforts of these groups will continue in 1994.

Consequently, any decision to release (formerly) classified data will be predicated upon the resolution of a number of security concerns. For example, the release of certain classified imagery could reveal information on the strategies and sensitive capabilities we use for effective collection. An adversary could use this information to largely negate our collection effort. Imagery often provides direct support to U.S. policymakers, and denial or limitation of access to previously accessible observations can have serious consequence, including the possible compromise of U.S. military actions.

Also, Intelligence Community resources are limited, and the collection of substantial environmental data could adversely affect our ability to collect against intelligence targets of interest to national security agencies and departments. All too often, resource constraints prevent us from satisfying all the national security collection demands placed on our systems. Depending on the scope of the requests for environmental information, a decision to use current systems to collect such information could significantly strain system capacity. The issue is one of balancing environmental alternatives in support of Presidential Review Directive 12 which states "the President has determined that international environmental issues are significant factors in U.S. national security policy," with a responsibility to also continue supplying technical intelligence over the range of today's foreign threats to the security of the United States. Indeed, the end of the Cold War has complicated our traditional collection tasks, as new and diverse challenges have emerged. Given these security considerations, it is critical that if a decision is made to provide data to the environmental community, intelligence capabilities should be used only when and where they provide a unique capability not normally available to the environmental community. Along these lines, the ETF scientists found that classified data which complements information obtained from civil systems to be of particular value. For example, the higher spatial resolution offered by some classified remote sensing systems can be used to establish ground truth for the coarser resolution of civil systems, a function especially important in inaccessible regions. Higher resolution can also provide more precise information on issues related to resource management, such as forest, desert, or wetlands extent; or ecosystem management, such as biodiversity decline. In addition, the older archives, should they be made available, can fill gaps in civil records: intelligence satellites flown before the first Landsat was launched could significantly extend environmental timeliness. Specific results of the ETF's deliberations can be divided into two categories: general support of environmental science and particular support to cross-cutting environmental themes. In the latter category, the ETF addressed the themes of climate change, biodiversity decline, population dynamics, environmental pollution/cleanup, resource management, and natural disasters.

In the area of general support to environmental science, the ETF found that accurate positioning systems would have numerous applications. Examples cited included monitoring movements of the polar ice pack and volcanic activity, and tracking mid-water oceanographic buoys.

Data needs related to climate change range across such areas as greenhouse gas concentrations; vegetation boundaries; ocean temperatures and sea level changes; and polar ice characteristics. Satellite systems designed to detect missile launches can also be used to detect and monitor large fires--which generate the greenhouse gases carbon monoxide and carbon dioxide--in remote areas. Changes in vegetative and desert boundaries, which may be sensitive indicators of global climate change, can be tracked over time by satellite systems. Classified archival data can be of particular value here, as it may extend the baseline obtained by civil systems. The monitoring of changes in ocean temperature could provide a direct measurement of global warming. Undersea listening systems also may be able to detect this effect by measuring changes in ocean sound speed over long distances. Airborne, satellite, and submarine coverage of the Arctic over decades can provide information on sea ice thickness, another critical indicator of climate change.

The well-published decline in the number of plants and animal species has implications for human health and diet, and overall ecosystem integrity. Classified collection assets can contribute to the monitoring of these biodiversity changes. These assets could be used to calibrate and interpret vegetation data obtained from coarser resolution civil sensors. In addition, imagery archives can provide a unique record of changes in vegetation extent. This information can be used to estimate changes in biodiversity and can help to validate ecosystem models. Undersea listening systems might be used to monitor the movements of whales, of direct relevance to scientists concerned with changes in the populations of these mammals.

The monitoring of land-use patterns is critical to assessing the environmental impact of population growth, urbanization, and industrialization. Archival data--particularly that which predates information available from civil satellites--can be of high value in determining the often gradual changes in urban dimensions that can significantly affect environmental quality.

By monitoring changes in ecosystems, remote sensing can play a role in tracking the severity and extent of environmental pollution. For example, the higher resolution characteristic of classified systems could provide more detailed evidence of damaged forests than that which can be obtained from civil satellite systems.

The management of natural resources such as forests, soil and arable land, surface and ground water, fisheries, and minerals can have an enormous impact on global environmental health. Again, the higher resolution classified systems could provide information on a level of detail not provided by civil space systems, applicable to such issues as coastline erosion, wetlands degradation, deforestation, desertification, agricultural practices, and water use.

Natural phenomena -- volcanic eruptions, earthquakes, and storms -- may alter the environment precipitously and sometimes catastrophically. Ground-based, aircraft, or low-resolution satellite surveys may take days or weeks to map the damage. Higher resolution imagery from classified systems can help minimize loss of life and property, and aid in damage assessment and restoration.

Although it is clear that classified data have the potential to contribute to our understanding of environmental problems, these benefits are not cost-free. Indeed, the costs related to the release of classified data to the public could be substantial. For example, if a decision is made to release some part of our classified data holdings, a workable and affordable system will need to be developed to ensure accessibility by the public. Such a system does not now exist. The ETF touched on procedures which could facilitate the use of released (formerly classified) data, should such a decision be made. It noted that the establishment of various institutional mechanisms would significantly enhance the benefits obtained from a data release.

Implementation of even some of these institutional mechanisms could require substantial additional personnel and funding by both the National Security and civil communities. In preparation for reception by the civil community of the imagery and supporting data, the national security community would require resources to permit archive facilities to catalog the imagery, and implement a product generation capability to reproduce the imagery and distribute it to the civil community.

Civil agency programs under the USGCRP have been structured and funding has been projected on a basis which does not include absorption of formerly classified information. However, over a transition period of roughly five years, the civil community is planning to fully incorporate classified data that may be released, and they intend to request funding sufficient to carry out the task of integrating data from both the classified and unclassified worlds. The five-year time period recognizes the time required at the outset for the national security community to index and prepare the data for delivery; for the archiving facilities to prepare for distribution of data to consumers; and for the development of communications interfaces which can work with both (formerly) classified and unclassified data. For example, the incorporation of released data will require development of interfaces to match the distributed data archiving architecture constructed for NASA's earth Observing System Data and Information System (EOSDIS). Further, over the long term, the integration of released data with civil data sets will require compatibility with the Global Change data and Information System (GCDIS), which is intended to build upon the EOSDIS and include non-space data sets.

The ETF focused on the application of classified data to environmental problems--especially global change issues--of particular interest to the academic community. A very important follow-on effort, begun this year and designated the Government Applications Task Force (GATF), is addressing the application of classified data to the missions of Federal agencies with substantial environmental and resource management responsibilities. The broadest use of classified data will probably be in support of these missions, since the agencies have provisions to use classified data in their work.

Finally, data which is not released may still have scientific utility. Government personnel and contractors with appropriate security clearances currently have the opportunity to work with this material. The National Security Community is assessing the potential gains and costs associated with broadening this access through adjustments in the security classification system.