MEMORANDUM OF UNDERSTANDING

BETWEEN THE

UNITED STATES GEOLOGICAL SURVEY
OF THE DEPARTMENT OF THE INTERIOR

AND THE

[**INTERNATIONAL COOPERATOR**]

for the Direct Reception and Distribution of Landsat 7 Data

Section I: Purpose

This Memorandum of Understanding (MOU), consisting of a main text and three annexes, establishes the terms and conditions under which the United States Geological Survey (USGS) will provide and the [IC] will receive, process, archive, and distribute data from the U.S. civil land remote sensing satellite program, hereafter referred to as the Landsat 7 system, which is managed by the USGS on behalf of the U.S. Landsat Program Management.

Section II: Undertakings of the Parties

A. The USGS, will endeavor to provide operational Landsat 7 service under the terms of this MOU and will:

1. Program, as requested by [IC], the Landsat-7 Enhanced Thematic Mapper-Plus (ETM+), to cover areas within the acquisition radius of the [IC] ground station to the extent that such requests can be accommodated by the Landsat 7 spacecraft. The USGS will endeavor to schedule Landsat 7 downlink resources to meet requests from all participating International Cooperators (ICs) in an equitable and balanced manner, subject to conflict-resolution guidelines to be provided to all stations. Programming details to meet such requests will be arranged by mutual agreement of the technical representatives provided for in Section II.C.1 of this MOU, based

on arrangements between the USGS and [IC].

2. Provide the [IC] with orbital elements for calculating the antenna pointing angles necessary to acquire the Landsat 7 spacecraft transmitted signals and with the necessary ancillary information for processing the data acquired.

3. Reserve the right to curtail or terminate transmission of data to the [IC] for reasons of (1) U.S. national security or international obligations and/or foreign policies, (2) spacecraft or the USGS ground equipment limitations, or (3) non-payment of cost-sharing fees as outlined in Annex I. In these cases, the USGS will notify [IC] and discuss the planned action in the most expeditious manner possible.

4. Make Landsat-7 data in its possession available in accordance with U.S. laws, policies and regulations.

B. [IC] shall:

1. Operate a ground station(s) for the reception, processing, archiving, and distribution of Landsat 7 data at its own cost, including the cost of establishing and operating the necessary communication links with NASA/USGS=s Landsat-7 Mission Operations Center located at the NASA Goddard Space Flight Center, Greenbelt, Maryland, U.S.A., and the USGS EROS Data Center (EDC) in Sioux Falls, South Dakota, U.S.A.

2. Produce Landsat 7 data products in accordance with such distribution formats as may be agreed. (See definition of Adistribution formats@ in Annex II)

3. Ensure that all Landsat 7 data acquired by the [IC] are available for sale or distribution on a public, nondiscriminatory basis. This applies to all Landsat data acquired under this MOU, as well as Landsat data acquired under previous MOUs.

4. Make available to the USGS upon request copies of any arrangements signed by [IC] concerning the distribution of Landsat 7 data from the [IC]. Such arrangements shall be consistent with the above provisions.

5. Pay to the USGS, or ensure the appropriate authorities of the government pay to the USGS in a timely manner, the cost-sharing fees described in Annex I to this MOU.

6. Maintain a current inventory of its Landsat 7 holdings and provide at least

monthly updates of their metadata, to the EDC in an agreed to format, electronically or on an agreed-to media, once the ground station is operational. These metadata will be made available publicly through U.S. data facilities.

7. Establish and maintain an on-line system, with external public access, of browse imagery for its Landsat 7 data holdings, or provide browse data at least monthly to the EDC in an agreed-to format and on agreed-to media, once the ground station is operational.

8. Maintain Landsat 7 data that have met [IC] quality standards in the [IC] archive for at least 10 years following data acquisition using accepted archive management practices. If the station plans to discard data, it will issue a purge alert to the U.S. National Satellite Land Remote Sensing Data Archive at EDC. The USGS will be given first right of refusal to acquire the data at the cost of reproduction and transmission.

9. Endeavor to ensure that any radio frequency problem occurring in relation to data reception by the [IC] ground station is resolved to the satisfaction of the parties to this MOU. Questions concerning radio frequency interference by the Landsat spacecraft raised by parties in third countries will be referred to the U.S. Government and the USGS for reply. The USGS will use the following frequency range for Enhanced Thematic Mapper Plus (ETM+) sensor data transmissions from the Landsat 7 spacecraft:

X-Band (8025 - 8400 MHZ).

10. Provide reasonable quantities of Landsat 7 data in the agreed-to data format and media, and at the cost of reproduction and distribution or a price to be negotiated, when requested by the USGS in support of key U.S. Government programs. (See definition of Adata format@ in Annex II)

11. Exchange limited amounts of Landsat 7 data in the agreed-to data format and media, when requested by the USGS for purposes of validating data quality. Data for this purpose would be exchanged semiannually with no exchange of funds. (See definition of Adata format@ in Annex II)

12. Provide sufficient quantities of Landsat 7 data to meet U.S. Landsat 7 mission requirements, in agreed-to data format and media, at the cost of reproduction and distribution, when requested by the USGS in response to a significant loss of the Landsat 7 spacecraft capability to acquire Landsat 7 data. For any support to [IC] beyond providing Landsat 7 data to the

EDC, the USGS and the [IC] will negotiate specific financial terms. (See definition of Adata format@ in Annex II)

C. It is further agreed that:

1. The USGS and [IC] will each designate program representatives to be responsible for the implementation of this MOU. The program representatives, or their designated representatives, will participate in the Landsat Ground Station Operations Working Group. This group, chaired by the USGS will serve as a forum for the exchange of programmatic, management, and technical information among station operators and the USGS. Discussions of specific technical matters may be delegated to a technical working group. Supplemental meetings between [IC] and the USGS will be held by mutual agreement.

2. The activities under this MOU will be conducted in accordance with the laws and regulations of the United States of America and [Country of the IC] respectively, and are subject to the availability of appropriated funds.

3. The USGS does not warrant the suitability of Landsat 7 data for any purpose.

4. The parties will not make claim or bring action against each other for any damage or injury brought about by the use of the Landsat 7 system.

5. The USGS EROS Data Center and the [IC designated agency] are authorized to enter into and modify as necessary technical, financial, and management implementing arrangements within the scope of this MOU.

6. The USGS will make every reasonable effort to avoid competition with the [IC] in filling orders for data from customers within the [IC] area of coverage. EDC staff members will encourage callers from the [IC] coverage area to first consider [IC] archives for local scenes. To facilitate this arrangement, the [IC] shall make available to the USGS EDC complete and current information sufficient for this referral.

7. When the coverage of an [IC] overlaps with that of another IC, the USGS will encourage [IC] and the other station operator to consult with a view toward reaching a mutually satisfactory understanding on responding to requests for data of the overlapping coverage area.

8. The USGS reserves the right to service the Landsat 7 data requests of all users affiliated with U.S. Government programs regardless of nationality or location.

9. The U.S. Government retains the ownership right to all Raw Landsat 7 Data (see definition in Annex II). Beyond the provisions of Section II.B.3, the USGS places no restrictions on [IC] to disclose, use, manipulate, generate products from, distribute or sell Landsat 7 data.

10. Technical information exchanged between the USGS and [IC] will be subject to the laws, policies, and regulations of the United States and the [Country of the IC], respectively. In the event it is necessary to exchange technical information and the furnishing party considers that such technical information is to be protected for proprietary or export control purposes, such information must be clearly marked with a legend indicating the country of origin, the conditions of release, that the information relates to this MOU, and that it is furnished in confidence. The USGS and [IC] will take all lawful steps available, to prevent disclosure of such information without the consent of the other party and to ensure that it is used only for the purposes of this MOU. The USGS and [IC] may release to the public other general, non-technical information regarding the Landsat program after ensuring, through consultation with the other party when necessary, that this information is fairly and accurately represented.

11. Any dispute in the interpretation or implementation of the terms of this MOU will be referred to the USGS National Mapping Program and the [designated IC organization] for settlement.

12. The USGS will provide reasonable quantities of Landsat 7 data in the agreed-to format and media at the cost of reproduction, or at a price to be negotiated, when requested by the IC.

Section III: Entry Into Force

A. This MOU shall enter into force upon signature by both parties and remain in force through the operational lifetime of the Landsat 7 spacecraft. Termination for whatever reasons will not affect the rights and obligations of the parties under sections II.B.3 and II.B.8 which will survive any termination. It is understood that this MOU may be amended by mutual agreement of the parties.

B. In the event that either the USGS or [IC] is unable to comply with any provision of this MOU, either party, after consultation with the other, shall have the option of terminating or suspending the activities under this MOU, providing that reasonable notification of such action is forwarded in writing by one party to the other.

IN WITNESS THEREOF, respective representatives have signed this Memorandum of Understanding.

For the United States Geological Survey of the Department of the Interior:	For the [International Cooperator]
_____	_____
Ms. Barbara J. Ryan	Name
Associate Director for Geography	Title
USGS National Center	Organization
Reston, Virginia	Location
_____	_____
(date)	(date)

ANNEX I
to the
Memorandum of Understanding
between the
United States Geological Survey
of the Department of the Interior
and the
[INTERNATIONAL COOPERATOR]
for the Direct Reception and Distribution of Landsat 7 Data

Cost-Share Agreement

I. Cost-Sharing Fee Structure

Pursuant to Section II.B.5 of the above Memorandum of Understanding (MOU), the USGS has established a fee structure for sharing the costs associated with the direct reception of Landsat 7 data to populate a global Landsat 7 archive.

The cost-sharing fee structure comprises a one-time initialization fee and an annual cost-sharing fee. An antenna move fee will be assessed, if an International Cooperator (IC) moves a receiving antenna to a new location greater than 50 kilometers from its original location. The annual cost-sharing fee will be payable for the United States Government (USG) Fiscal Year, which begins on October 1 and ends on September 30, and will be prorated to the remaining portion of the USG Fiscal Year, from the start date for direct transmission of Landsat 7 data to September 30. At the beginning of each new USG Fiscal Year, the USGS and the **[IC]** will review this Annex, and revise if necessary.

II. Fees

The initialization fee is $50,000 U.S. for each receiving site. The antenna move fee is $25,000 U.S., and will be billed each time a station is moved a distance greater than 50 kilometers. The total initialization fee for **[IC]** will be $_____ U.S. for the receiving site(s) located at _____.

The annual cost-sharing fee for **[IC]** is **$250,000** U.S (for a basic, single station operation). This fee covers all land scenes to be received by the identified receiving site(s). The cost-sharing fee will be prorated from the operational start-up date of the [IC] to the end of the U.S. Government Fiscal Year. The prorated cost-sharing fee for [IC] in FY ___ is $_____U.S., based upon an operational start date for Landsat 7 data reception on _____ and extending to September 30, ____.

International Cooperators with multiple receiving sites will resolve any downlink scheduling conflicts by designating the respective receiving site to be used for their data requests.

III. Billing Cycle

The one-time initialization fee is due and payable 30 days prior to the [IC] receiving Landsat 7 data.

The cost-sharing fee may be payable either quarterly or annually. International Cooperators choosing quarterly billing will receive a bill 30 days prior to the start of each quarter for the USG Fiscal Year (billing dates include: September 1, December 1, March 1, and June 1). International Cooperators choosing annual billing will receive an annual bill 30 days prior to the start of the USG Fiscal Year (billing date of September 1)

Quarterly payments by International Cooperators will be due at the start of each quarter of a USG Fiscal Year (payment due dates: October 1, January 1, April 1, and July 1). Annual payments by International Cooperators will be due at the start of the USG Fiscal Year (October 1).

The USGS reserves the right to terminate transmission of Landsat 7 data to [IC] at any time that the [IC] is in arrears in its payments to the USGS, provided that the USGS notifies [IC] 30 days in advance of its intention to terminate transmission for this reason. Payments may be by check or wire transfer in U.S. dollars.

Payments by check shall be in U.S. dollars and shall be payable to:

Department of the Interior/USGS

Payments by check shall be mailed to:

USGS Office of Financial Management
271 National Center
Reston, VA, 20192
U.S.A.

Payments by wire transfer shall be in U.S. dollars and transferred to the USGS's bank account. The USGS's bank account information is as follows:

Billing agency: Department of the Interior/USGS
Bank name: Federal Reserve Bank of New York
Bank location: New York, New York
Bank account number: 021030004*

* The USGS will provide exact wire transfer information with each billing.

IV. Fee Changes

While USGS reserves the right to make modifications to the annual cost-sharing fee used in this fee structure, it is the USGS=s intent to maintain the fee structure during the life of the Landsat 7 mission. Reasonable notification of any proposed change to these fees (initialization, antenna move, and annual cost-sharing fees), taking into account the budget cycles of the parties to this agreement, shall be provided in writing by the USGS to **[IC]** 60 days prior to the implementation of the proposed change. Any proposed fee change would not exceed 10% of the current annual cost-sharing fee.

V. Contingencies

The USGS, in consultation with the [IC], may curtail or terminate the transmission of data and adjust the cost-sharing fees if the USGS is unable to satisfy data requests due to spacecraft system capability limitations or too many ground receiving stations.

In addition, the USGS will consider an adjustment in fees for the next annual billing cycle if the [IC] significantly changes its request for Landsat 7 data. USGS will provide reasonable notification in writing of any changes (e.g. inflation, program costs, amount of data transmitted, number of receiving stations, etc.) that might impact the amount of data transmitted or the established annual fee structure proposed for the upcoming fiscal year.

USGS reserves the right to temporarily terminate transmission of Landsat 7 data to the [**IC**] any time payment is not received and for other obligations as identified in the Billing Cycle section above and in Section II.A.3 and section III.B. of the MOU, provided that USGS notifies the **[IC]** 30 days in advance of its intention to terminate transmission.

VI. Duration of Annex

This annex will remain in effect, under the auspices of the MOU for the Direct Reception and Distribution of Landsat-7 Data, unless revised by mutual consent of USGS and the **[IC]** through exchange of letters. At the beginning of each new USG Fiscal Year, the USGS and the [IC] will review this Annex, and revise if necessary.

VII. Authorization

The **[IC]** agrees to provide payment as described above for the Landsat 7 data transmitted to the receiving site(s) located at _____.

_____ _____

Authorizing [IC] Signature Date

ANNEX II
to the
Memorandum of Understanding
between the
United States Geological Survey
Department of the Interior
and the
[INTERNATIONAL COOPERATOR]

Definitions of Terms Used in this MOU

Acquisition radius of the ICs:

Those portions of the Earth that can be viewed by the satellite=s imager while the satellite is in view of the receiving site of the International Cooperator.

Agreed to Data Format:

See Data Format

Browse:

Sub-sampled Level 0R digital image of the Earth that can be viewed on a scene basis to quickly assess general ground area coverage, data quality, and the spatial relationships between ground area coverage and cloud coverage. A browse image provides a coarse spatial resolution image with a reduced data volume to facilitate screening of archived Landsat 7 data. (Specifications regarding browse images are documented in the Landsat 7 to International Ground Stations Interface Control Document, Rev. D, April, 2000)

Cost of Reproduction and Distribution:

Reproduction and distribution costs refer to the direct costs involved in preparing and transferring a data tape. These costs include: extraction of requested data from the local archive or inventory, as needed; preparation of datasets in a mutually acceptable format; production of data products on mutually acceptable media; shipping and handling charges; and labor and overhead associated with provision of these data. These costs may not include amortization of equipment, or any pro-rata share of normal station operations. ICs will specify this cost in writing to USGS at the beginning of operational acquisition of Landsat 7 data and on an annual basis thereafter when Annex I of this MOU is reviewed.

Data Format:

In Section II.B.10-12, the term data format refers to the LTWG recommended data format

for exchanging data between International Cooperators and the EDC. The data exchange format for purposes of quality assessment and key government programs is **both** Raw Computer Compatible data on DLT (Landsat 7 Raw Computer Compatible Data Format Control Book, December, 2000) **and** the Level-0Rp product in HDF format (Landsat 7 Data Format Control Book, Volume 5, Book 1). Should there be a significant loss of the Solid State Recorder capacity, the USGS will require International Cooperators to provide Landsat 7 data to populate the U.S. archive. The data exchange format for such a contingency bulk transfer will be either Raw Serial Downlink or Raw Computer Compatible Landsat 7 data.

Distribution Format:

In Section II.B.2, the term Adistribution formats@ refers to the three data product distribution formats for EDC produced Level 1 data products; namely HDF, Geo-Tiff, and Fast formats. International Cooperators are encouraged, but not required to produce Level 0Rp data products in HDF format, but are required to distribute Level 1 data products in at least one of the three formats listed above.

International Cooperator (IC):

Any non-US government agency or commercial organization acting on behalf of or in cooperation with an international government agency which enters into an agreement with the USGS for purposes of receiving Landsat 7 data.

Key U.S. Government programs:

United States Government agencies and U.S. Government contractors, other U.S. and international researchers and entities involved in the United States Global Change Research Program, and U.S. and international researchers and entities having signed a cooperative agreement with the United States Government involving the use of Landsat data for non-commercial purposes.

The U.S. Global Change Research Program is the Executive Branch program responding to Public Law 101-606, the Global Change Research Act of 1990, and most recently described in the annual report accompanying the President=s budget entitled AOur Changing Planet: The FY 1998 U.S. Global Change Research Program.@

International counterpart programs of the U.S. Global Change Research Program are discussed on pp. 69-75 of AOur Changing Planet.@ These include: the World Climate Research Program, the International Geosphere-Biosphere Program, the International Human Dimensions Program, the Intergovernmental Panel on Climate Change, the International Ozone Assessment, and the Inter-American Institute for Global Change Research.

Landsat Program Management:

The team of USGS and NASA managers who are responsible for determining policy of and oversight for the Landsat 7 missions operations. The team is represented by a Landsat Coordinating Group that includes the Associated Administrator for NASA=s Earth Science Enterprise, and the Director of the USGS.

Landsat 7 Data Products:

The U.S. Landsat 7 data products are Level-0Rp, Level-1R (radiometrically corrected only), and Level-1G (systematically corrected only). International Cooperators may produce data products of their choice. ICs are encouraged, but not required to produce Level 0Rp data products in HDF format, but are required to distribute Level 1 data products in at least one of the three formats listed under Adistribution format@ above.

Landsat 7 Mission Operations Center (MOC);

Located at the Goddard Space Flight Center (GSFC) in Greenbelt, Maryland (USA), the people, procedures, and hardware/software systems used for the successful execution of real-time spacecraft operations and off-line scheduling and analysis activities. All command and control functions of the spacecraft, performed by the Landsat 7 Flight Operations Team (FOT), will take place from the MOC.

Metadata:

Descriptive information pertaining to the Landsat 7 data sets, including such information as location and acquisition date, compiled for Level 0R ETM+ data and available through the EOSDIS user interface. (Specifications regarding the metadata are documented in the Landsat 7 to International Ground Stations Interface Control Document, Rev. D, April, 2000)

Raw Landsat 7 Data:

Landsat 7 data in the form of wideband telemetry transmitted by the satellite, or minimally pre-processed data to a level less than or the equivalent of the U.S. Level 0Ra (archive) data.

U.S. Government and Affiliated Users:

United States Government and Affiliated Users; any federal, state or local government agency personnel and personnel from any organization performing cooperative work with or for these government agencies.

Annex III
to the
Memorandum of Understanding
between the
United States Geological Survey
of the Department of the Interior
and the
(International Cooperator Name here)
For the Direct Reception and Distribution of Landsat 7 Data

Landsat 7 Data Exchange between the U.S. Landsat Operator and the International Cooperator

I. Purpose of the Annex:

The purpose of this Annex is to describe and define the terms and conditions for Landsat 7 data exchange between the U.S. Landsat 7 Operator (USGS) and the International Cooperators. This Annex, when signed by the USGS and the International Cooperator, constitutes the third Annex to the Memorandum of Understanding (MOU) between the USGS and the International Cooperator (Agency Name) for the Direct Reception and Distribution of Landsat 7 Data.

Data exchange may be a one-way or two-way exchange depending upon the purpose of the exchange, using the data exchange formats defined in Annex II (Terminology) to this MOU and restated in this Annex. This Annex defines the purposes for data exchange, the requirements in the MOU, the terms and conditions, and the funding mechanisms to pay for data exchange.

II. Background Data Exchange Requirements:

Sections II.B.10, 11, and 12 of the MOU for the Direct Reception and Distribution of Landsat 7 Data document the International Cooperator requirements to provide Landsat 7 data to the USGS. Section II.B.10 and 11 are two-way exchanges from International Cooperators to the USGS, and from the USGS to International Cooperators. Section II.B.12 is a one-way exchange of data from ICs to USGS.

Section II.C.12 of the MOU states that the USGS will provide reasonable quantities of Landsat 7 data in the agreed-to format and media at the cost of reproduction, or at a price to be negotiated, when requested by the International Cooperator. This is a one-way exchange from the USGS to ICs, in the event that the ground station experiences a short-term loss of data reception.

III. Purposes for Data Exchange:

There are three stated purposes in the MOU for data exchange between International Cooperators and the USGS; they are: for key U.S. government programs (Section II.B.10), for validating data quality (Section II.B.11), and for a significant loss of Landsat 7 spacecraft capability to acquire

Landsat 7 data (Section II.B.12), such as a failure of the Landsat 7 Solid State Recorder (SSR). A fourth purpose, although not explicitly stated in the MOU, is to populate IC archives in the event of a short-term loss of Landsat 7 data reception at the IC ground station(s).

Definitions for each data exchange purpose, and the terms and condition for each type of data exchange are addressed separately in the following sections.

IV. Data Exchange for Key Government Programs:

Whereas Section II.B.10 of the MOU refers to data exchange for Akey **U.S**. Government programs@, data exchange for this purpose is a two-way exchange of data for U.S. government and International Cooperator government agencies. To qualify for this purpose of data exchange the Landsat 7 data must be used for research or emergency/disaster applications by a government organization. Because these data are deemed of special value they may be archived by either the USGS or the International Cooperator, and used for subsequent product generation, data sales, and data distribution per the local ground station data policy.

The volume of data exchanged for key government programs should be limited to approximately 500 Landsat 7 scenes per year per station. The frequency of exchange may vary depending upon the number and nature of the research program or upon unexpected disaster events.

Each station (the USGS EROS Data Center, included) should establish procedures, including a point of contact, for accepting requests for and distributing the data in **both of the** data exchange formats; namely Raw Computer Compatible***** data on DLT tapes **and** Level 0Rp data products in the HDF format as ftp files or on 8 mm tape or CD-ROM, as agreed to at the time of the exchange. Attention should be given to a quick turnaround time when the data are to be used for emergency/disaster applications.

The USGS will provide either of the two data formats***** specified, however a request for Level-0Rp data products would be scene-based, whereas a request for Raw Computer Compatible data would include all of the scenes on the downlinked subinterval.

V. Data Exchange for Validating Data Quality:

Data exchange for this purpose is a two-way process, for verifying that the data exchanged are readable and that the quality is comparable with U.S. held Landsat 7 data. Procedures will be established for the regular exchange of data from an International Cooperator to the USGS. The USGS will respond to requests from International Cooperators for data to validate data quality and the readability of U.S. generated data. Generally the data exchanged for validating data quality would be selected based upon the existence of duplicate scenes in the U.S. and IC archives; hence there would be no need to archive the exchanged data, as a copy would already exist in both archives.

The volume of data to be exchanged is on the order of 25-50 Landsat 7 scenes per year per

station. Once procedures are in place, requests for data for validating data quality will occur about twice a year and as requested by USGS.

Each Cooperator (the USGS EROS Data Center, included) should establish procedures, including a point of contact, for accepting requests for and distributing the data in **both of the** data exchange formats; namely Raw Computer Compatible* data on DLT tape, **and the** Level 0Rp data products in the HDF format on 8 mm tape or CD-ROM, as agreed to at the time of the exchange. Procedures will be established for reporting the results of the data quality validation.

VI. Data Exchange for a Significant Loss of Landsat 7 spacecraft capability:

The primary intent of this MOU requirement is to provide a mechanism for the USGS to obtain data from International Cooperators should there be a loss in the Landsat 7 spacecraft capability to acquire Landsat 7 data (namely a temporary or sustained loss of spacecraft ability to record data on the SSR, and to playback and/or downlink recorded data, or any emergency situation as determined by the USGS Mission Management Office). This is a one-way exchange of data from International Cooperators to the USGS. Since the purpose is to populate the U.S. archive for global change research, the USGS will produce and distribute products from these data no earlier than 30 days following the date of acquisition, with no restrictions limiting the use and redistribution of the data products.

The volume of data to be exchanged will vary depending upon the nature of the failure and from station to station. Data volumes would be negotiated on a station-by-station basis at the time of a temporary or permanent failure. Scenes would be requested based on low cloud coverage and the exchange process would operate throughout the year.

The data exchange format requirement for a temporary or permanent loss of spacecraft capability is different from the other purposes for data exchange. USGS will request data in either a raw serial downlink format or a Raw Computer Compatible data (DLT tapes) format. The USGS would negotiate with each International Cooperator how much support USGS would provide (if necessary) to modify a ground station to assure that Landsat 7 data are provided in the required formats.

In addition, the USGS would renegotiate the data access fees and/or per scene costs for data.

VII. Data Exchange for a Short-term Loss of IC Reception Capability:

In addition to requesting Landsat 7 data from the U.S. for key government programs and validating data quality, International Cooperators may request Landsat 7 data from the U.S. archive in the event of a short term loss of Landsat 7 direct data reception at the IC ground station, provided such data are within the IC coverage circle and are available in the U.S. archives. In addition, IC may request data acquisitions from the Solid State Recorder during planned outages. Such requests will be considered pending the availability of SSR resources.

The data exchange for this purpose is a one-way exchange from the U.S. to the International Cooperators. The data volumes for these short-term losses should not exceed 300 scenes per year per station.

The data formats that may be requested are Raw Computer Compatible* data on DLT tape, and Level 0Rp data products in the HDF format as ftp files, on 8 mm tape, or on CD-ROM, as agreed to at the time of the exchange. The data would be available at the cost of reproduction or at a price to be negotiated.

VIII. Funding Mechanisms:

The USGS and the International Cooperators are required by the MOU to provide data via the data exchange process at the cost of reproduction and distribution (key government programs, population of the U.S. archive in the event of a SSR failure, and population of IC archives in the event of a short-term loss of reception capability) or a price to be negotiated (key government programs, and population of IC archives in the event of a short-term loss of reception capability). The USGS and ICs would exchange data for validating data quality at no cost.

The Acost of reproduction and distribution@ as defined in the Annex II (Terminology) to this MOU is as follows: "Reproduction and distribution costs refer to the direct costs involved in preparing and transferring a data tape. These costs include: extraction of requested data from the local archive or inventory, as needed; preparation of datasets in a mutually acceptable format; production of data products on mutually acceptable media; shipping and handling charges; and labor and overhead associated with provision of these data. These costs may not include amortization of equipment, or any pro-rata share of normal station operations. ICs will specify this cost in writing to USGS at the beginning of operational acquisition of Landsat 7 data and on an annual basis thereafter when Annex I of this MOU is reviewed."

The USGS will provide Landsat 7 data through the data exchange process at the cost of reproduction and distribution. The cost of reproduction and distribution for a Landsat 7 Level 0Rp scene data product is the USGS interim bulk order price (reduced 20% from the standard Level-0Rp data product price) and for Raw Computer Compatible data the cost-of-reproduction is still "to-be-determined" pending the implementation of processing capability to offer these data.

The following mechanisms may be used for reimbursement for the exchange of Landsat 7 data between International Cooperators and the USGS, based upon mutual agreement:

1. Quid-Pro-Quo: International Cooperators and the USGS may agree to exchange data for data, based upon equivalent prices, volume and/or service.

2. Data in lieu of Cost-sharing fees: the USGS may offer to reduce the cost-sharing fees in direct proportion to the cost of data requested through the data exchange process. Alternatively, International Cooperators requesting data from the USGS may request that the

costs for the data be added to the cost-sharing fees that are billed either quarterly or annually.

3. Other mechanisms for payment of exchanged data may be used as agreed to between the USGS and the IC.

IX. Data Exchange Implementation :

The USGS will prepare and implement a Data Exchange Implementation Plan and a Data Validation Plan to provide more detailed instructions regarding the mechanisms for data exchange. The Plan will be updated periodically to reflect any changes that may be discussed and approved by LTWG and LGSOWG respectively.

X. Authorization:

The terms and conditions of this Annex are in effect on the date when both the authorized USGS representative and the International Cooperator have signed this Annex below.

_____ _____

Ms. Barbara J. Ryan Date
Associate Director for Geography
USGS National Center
Reston, Viriginia

_____ _____

Authorized International Cooperator Date

***** The USGS can receive, but not currently provide Raw Computer Compatible data. The USGS will offer these data in exchange pending the planned implementation of processes to facilitate the exchange of this format and media.