



Office for Outer Space Affairs
United Nations Office at Vienna



Distribution and Use of Available LANDSAT Data Sets for Sustainable Development in Africa

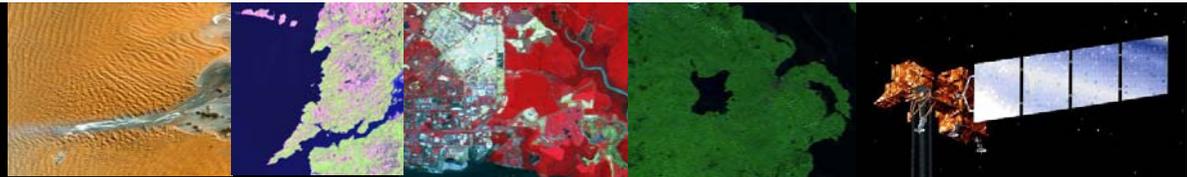
Sharafat Gadimova
Office for Outer Space Affairs
United Nations

**United Nations/Morocco/European Space Agency International Workshop on the
Use of Space Technology for Sustainable Development
25 – 27 April 2007, Rabat, Morocco**

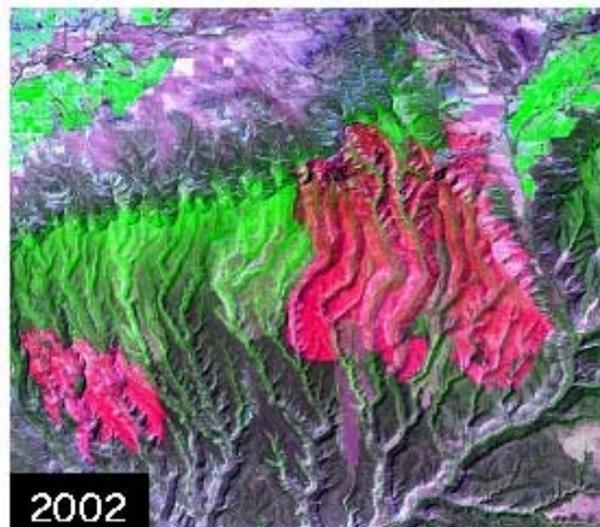
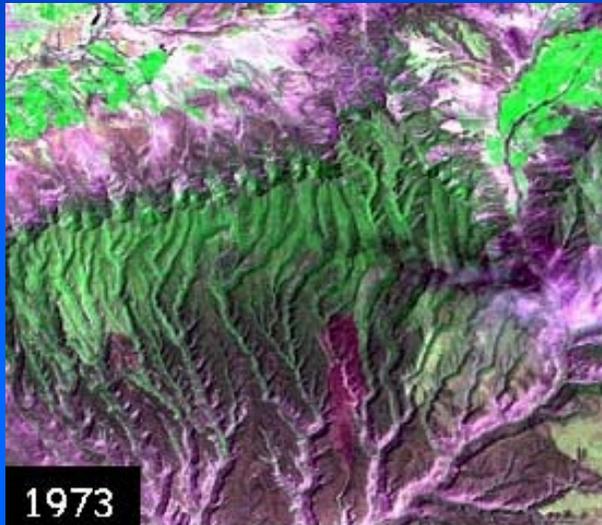


BACKGROUND

- × **The Government of the United States of America donated the *circa* 1975, 1990 and 2000 global LANDSAT data sets to the United Nations for further distribution and use by the international community**
 - × **UNEP and USGS have initiated an initial distribution to three regional centres in Africa (RCMRD, AGRHYMET, SADC/RRSU)**
 - × **FAO has contributed to the dissemination of the data through its Africover programme**
 - × **UN OOSA through its programme on Space Applications is providing part of these data sets to African Institutions upon request**
 - × **UN-Affiliated Regional Centre in Rabat, Morocco and Ile-Ife, Nigeria are focal points to facilitate the distribution of the available data sets to African Institutions**



DATA ARCHIVE – 32 Years and Counting



Over 1.6 million
Landsat scenes

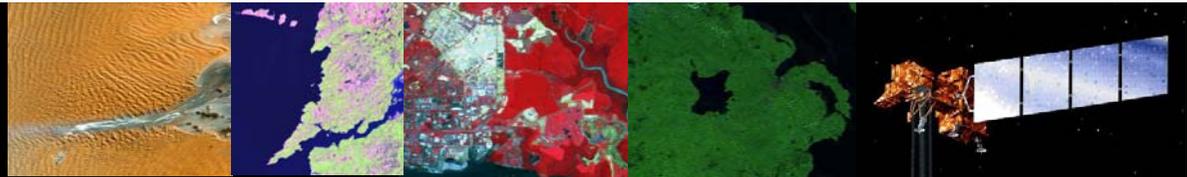
Over 630 terabytes of
data

Grows by over 320
gigabytes/day

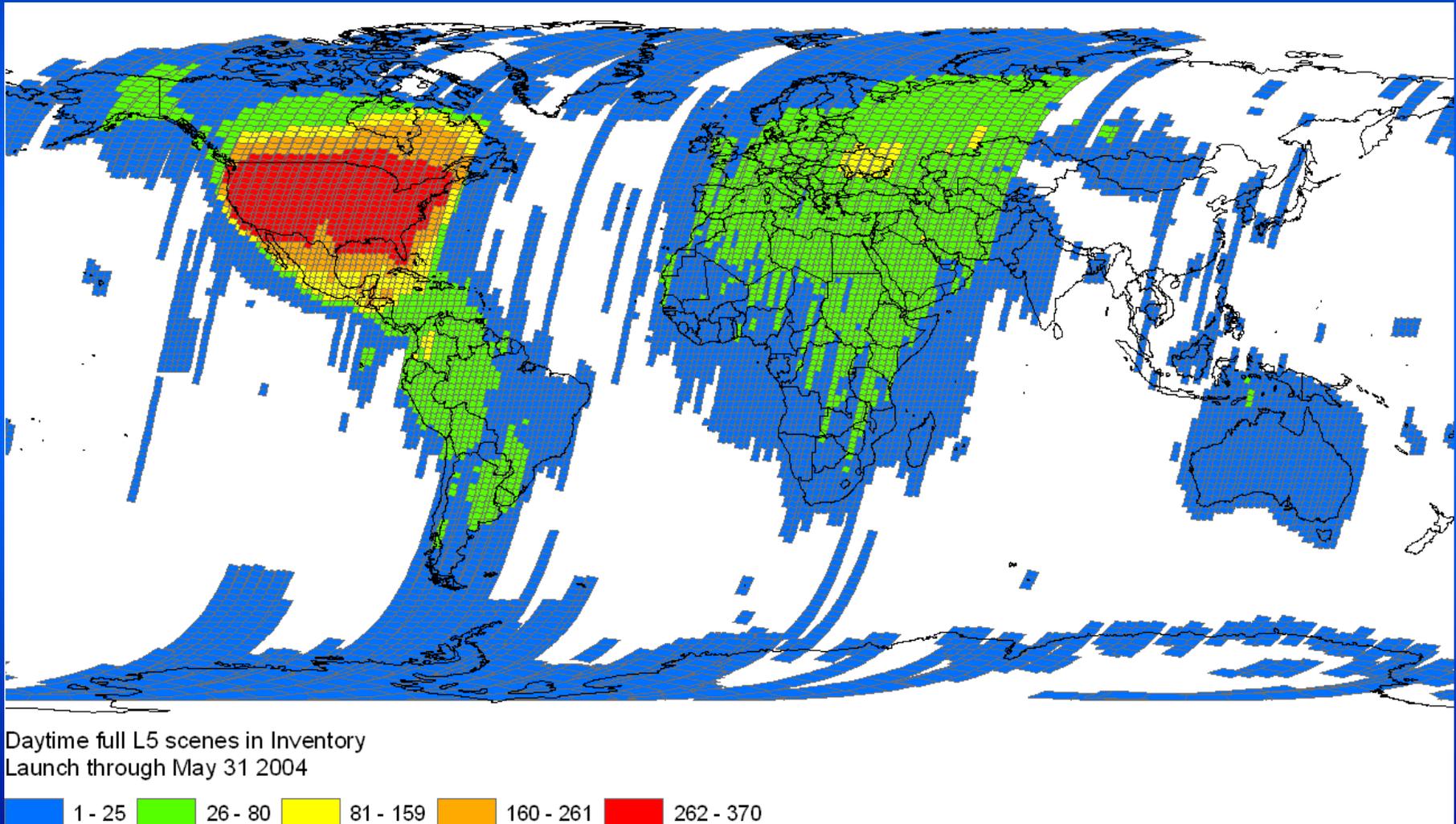
Fire Scars: Mesa Verde
National Park, Colorado



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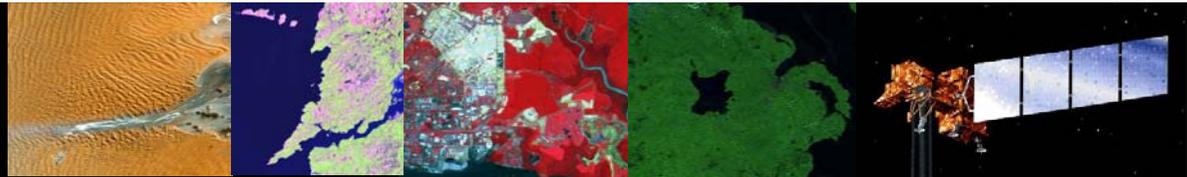


LANDSAT 7 U.S. Global Archive

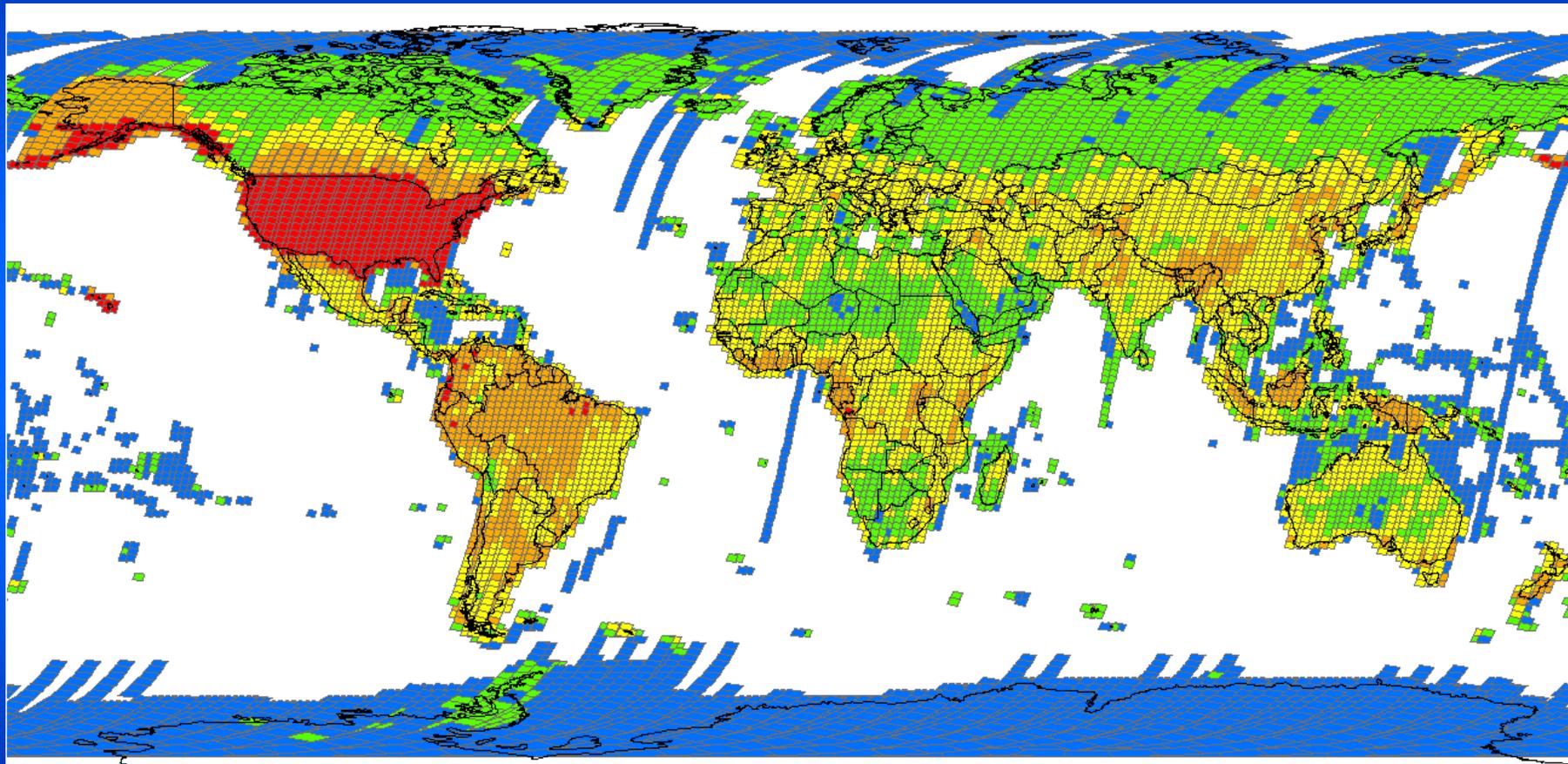




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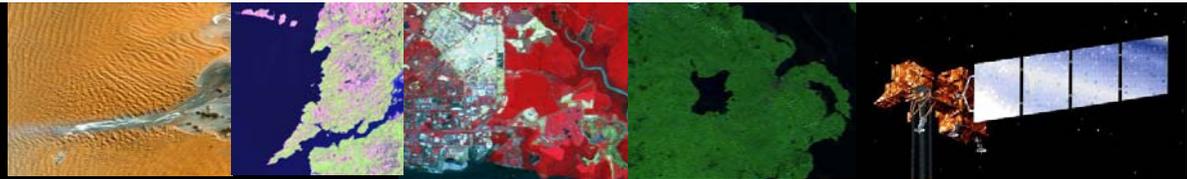


LANDSAT 7 U.S. Global Archive

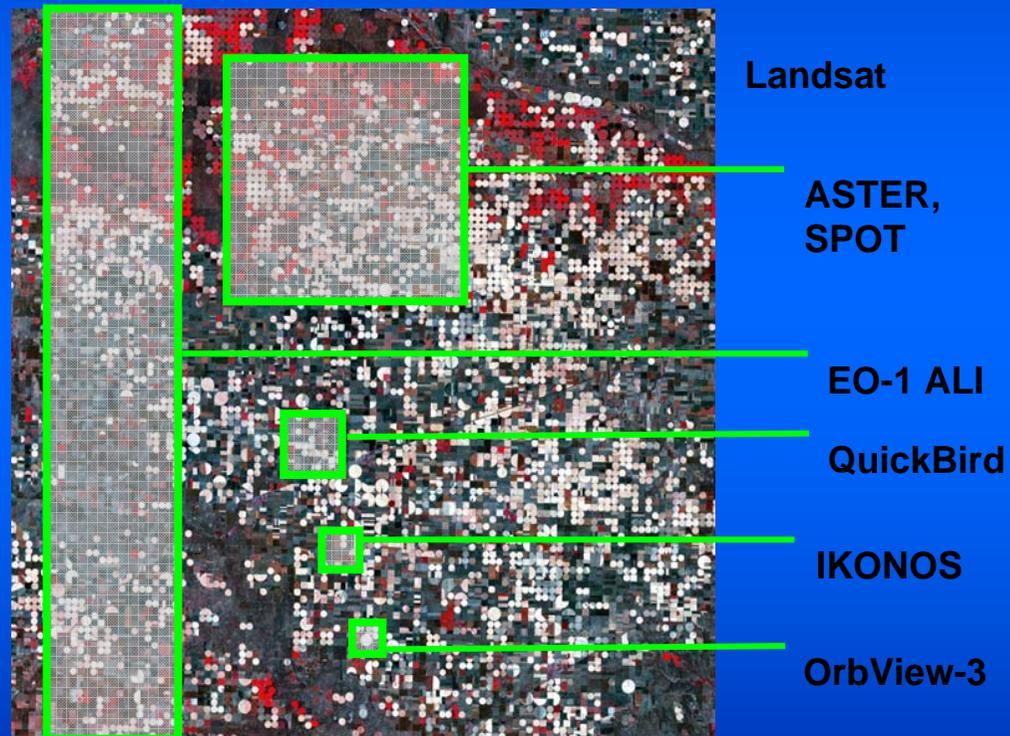


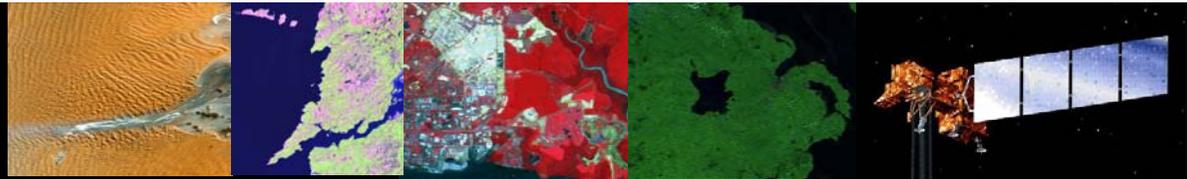
Daytime full L7 scenes in Inventory
Launch through May 31 2004



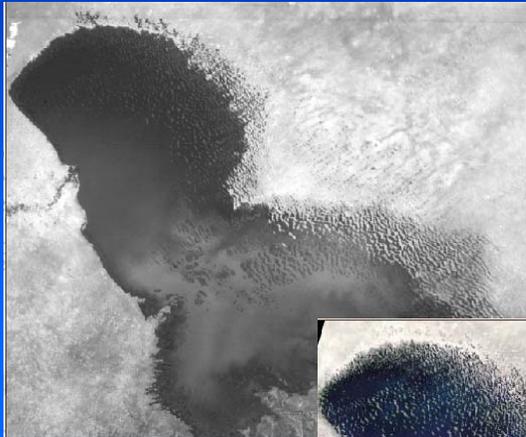


POSSIBLE LANDSAT ALTERNATIVES



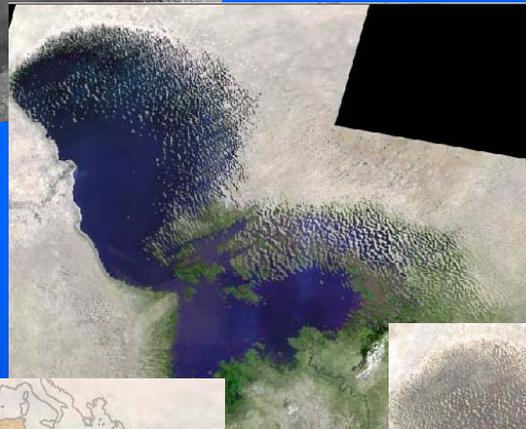


Monitoring Drought on Lake Chad



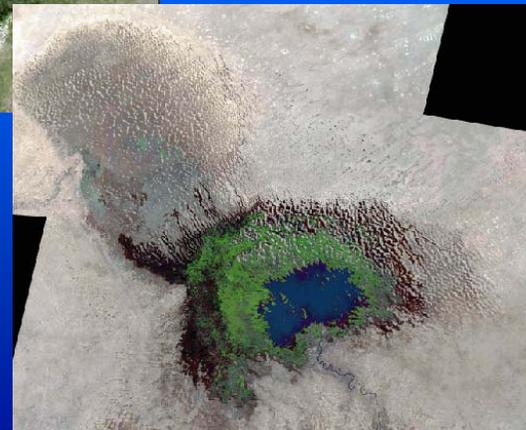
1963

Declassified satellite image shows Lake Chad, once the sixth-largest lake in the world



1987

Landsat MSS illustrates decline of the Lake Chad



1999

Landsat ETM+ image shows Lake Chad, now 1/10 its size in the 1960s



PROJECT: Distribution and Use of Available Global Landsat Data Sets for Sustainable Development in Africa

- × **November 2003, Dakar, Senegal, Expert Meeting for the Western African and Regional African Institutions**
 - × Review current obstacles and opportunities to accelerate the distribution of the available global LANDSAT data sets to support natural resources management, environmental monitoring, disaster management and sustainable development in Africa
- × **October 2004, Nairobi, Kenya, Expert Meeting for the Southern and Eastern African Institutions**
 - × Discuss possible partnerships and projects that can be developed jointly taking advantage of the available LANDSAT imagery
- × **July 2005, Rabat, Morocco, Workshop for the Northern African Institutions**
 - × Train users in the use of the data sets involving the students of the nine-month post-graduate course
- × **November 2005, Pretoria, South Africa, Seminar during Africa GIS Conference**
 - × Review the progress made in the distribution of imagery and evaluate the impact made with the availability of the Landsat data sets



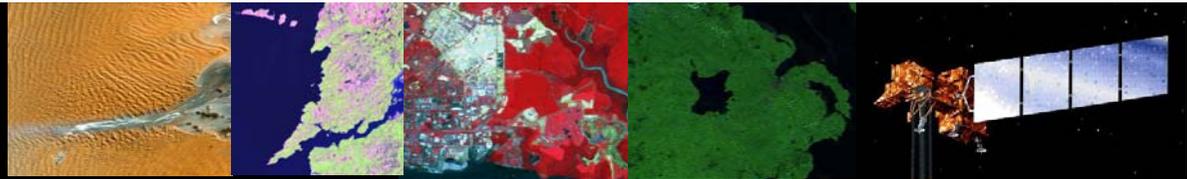
LANDSAT IMAGERY

- × **Global Landsat Data currently available at UN-OOSA, CRASTE-LF and ARCSSTE-E**
 - × **LANDSAT Multi-Spectral Scanner (LANDSAT MSS)**
 - × **LANDSAT Thematic Mapper (LANDSAT TM)**
 - × **LANDSAT Enhanced Thematic Mapper Plus (LANDSAT ETM+)**

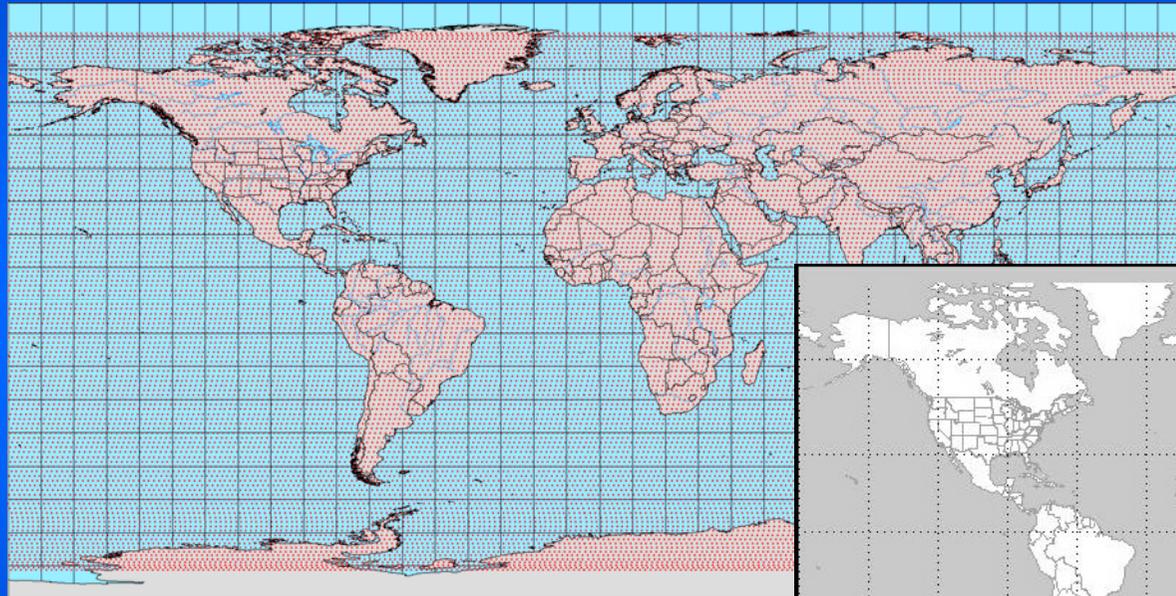


LANDSAT IMAGERY (continued)

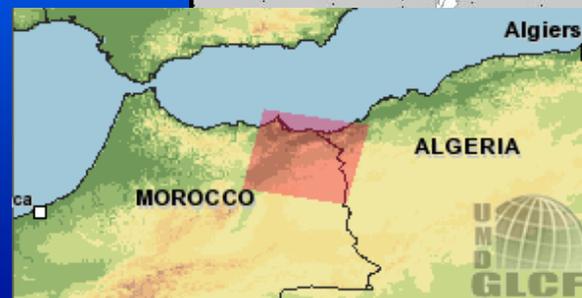
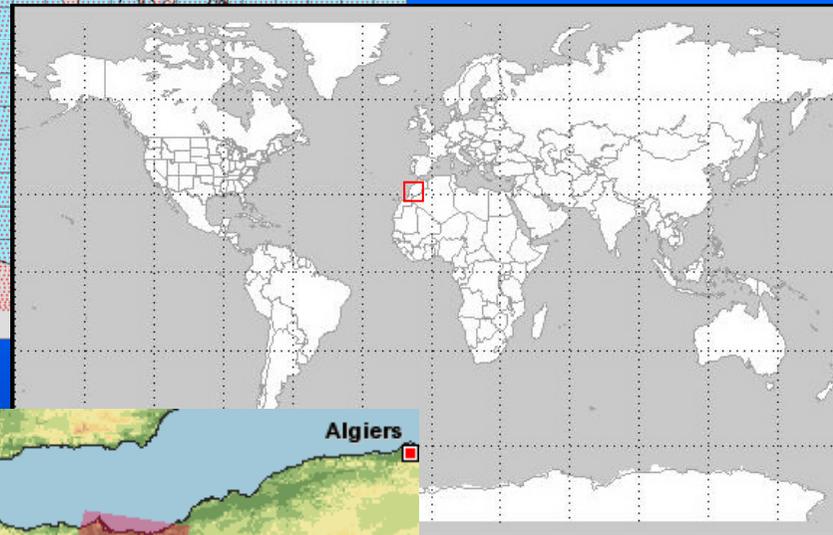
- × **World Reference System (WRS1 for MSS & WRS2 for TM and ETM+)**
 - × The WRS indexes orbits (paths) and scene centres (rows) into a global grid system comprising 233 paths by 248 rows
 - × Each Path and Row combination describes a unique rectangular “scene” of satellite data/imagery

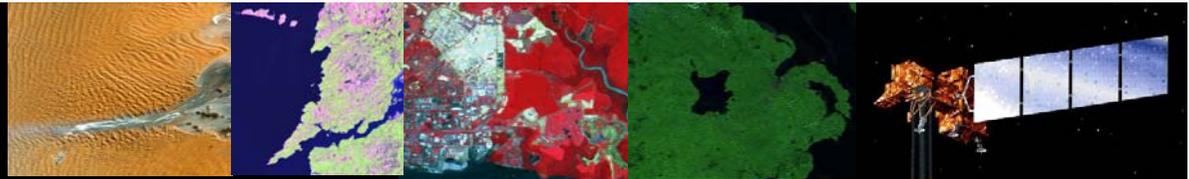


LANDSAT IMAGERY (continued)



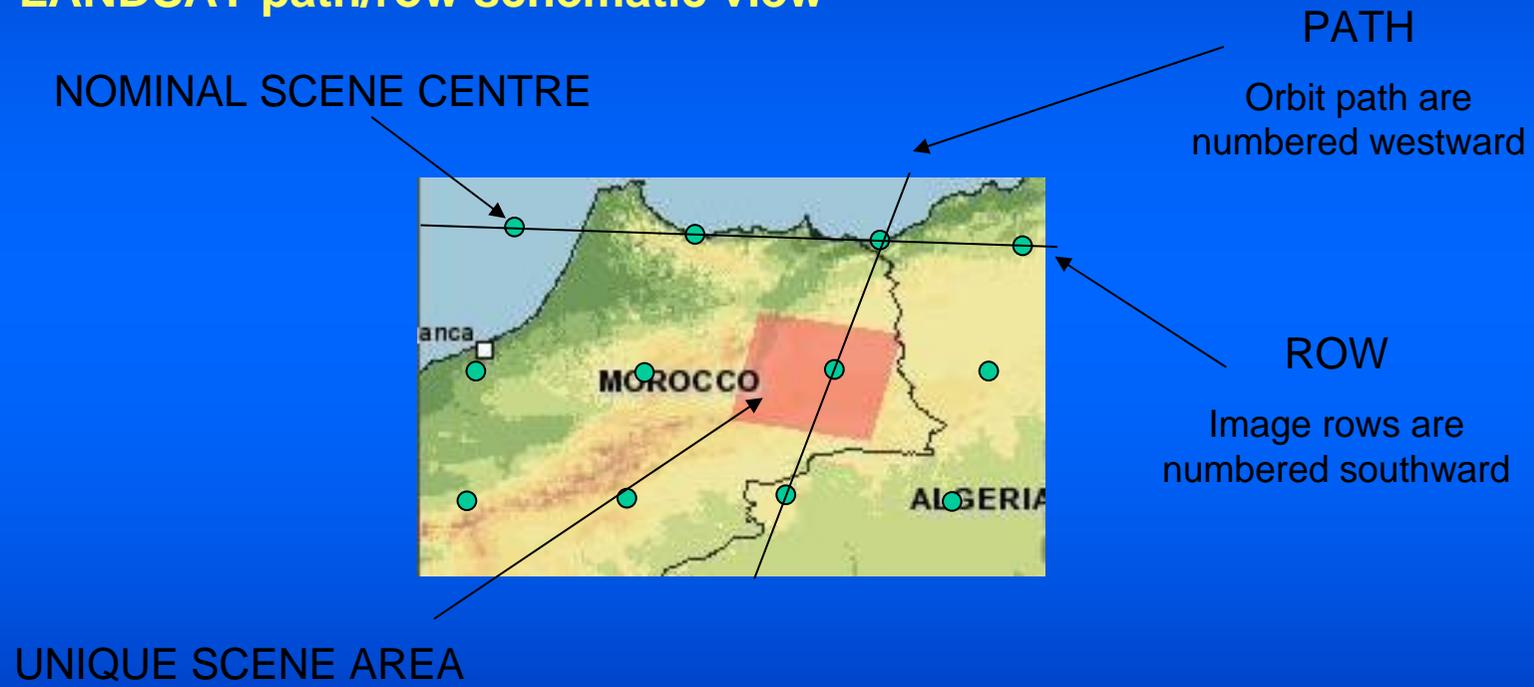
- red dots represent Landsat scene center points

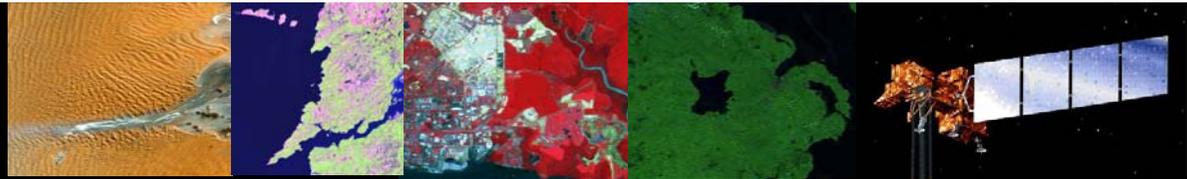




LANDSAT IMAGERY (continued)

× LANDSAT path/row schematic view





LANDSAT IMAGERY (continued)

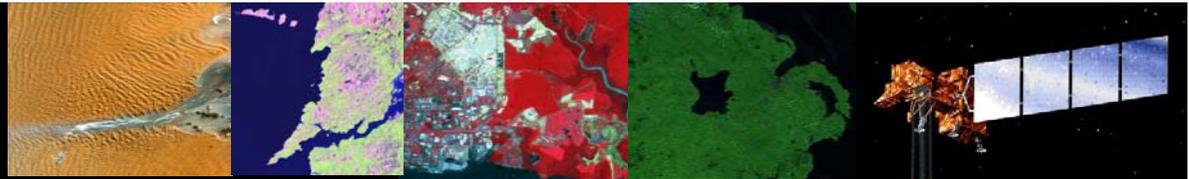
- × **Data Format Properties**
 - × Each LANDSAT scene is available with bands as separate files
 - × Most files are compressed using .gzip., so that files have a “.gz” extension
 - × The first step is to .unzip. the file
 - × This opens the LANDSAT image band in its native GeoTIFF file format



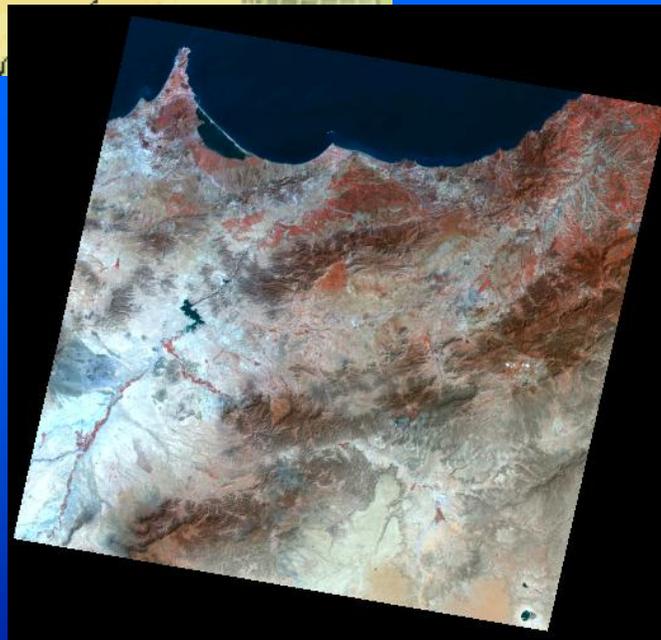
LANDSAT IMAGERY (continued)

x **Data Format Properties**

- x A GeoTIFF file can be used as a TIFF file in any graphical software *or* if there is software the GeoTIFF header will provide geo-reference information
- x The geo-reference formats include a UTM projection and WGS84 datum and ellipsoid;
- x All these characteristics are listed in the metadata file accompanying the scene;



LANDSAT IMAGERY (continued)



TM

WRS-2, Path 199, Row 036

1988-03-16

Ortho, GeoCover

Morocco, Algeria



DATA ACCESS

- × **Michigan State University's Tropical Rain Forest Information:**
<http://www.landsat.org>
- × **University of Maryland's Global Landcover Facility GLCF:**
<http://glcfapp.umiacs.umd.edu:8080/esdi/index.jsp>
- × **Federation of Earth Science Information Partners:**
<http://www.esipfed.org>



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DATA REQUEST

∞ **For further information on LANDSAT data sets please contact:**

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P.O. Box 500, A-1400 Vienna, Austria

Fax: +43 1 260 60 5830

Email: ooa@unvienna.org

Web: <http://www.unoosa.org/ooa/en/SAP/rs/index.html>