

# Agriculture and Food Security Global Spatial Data Initiatives

GLOBAL SPATIAL DATA AND INFORMATION USER WORKSHOP  
Development, Dissemination, and Use

Dr. Robert Zomer  
Global Coordinator  
CGIAR Consortium for Spatial Information  
(International Water Management Institute - IWMI)  
Colombo, Sri Lanka

Dr. Tim Robinson  
FAO – Rome

Organizers: CIESIN, FAO, UNEP, WHO, and CGIAR  
Co-Sponsors: CODATA and SEDAC

Dates: 21-23 September 2004

Venue: Lamont-Doherty Earth Observatory, Columbia University  
Palisades, New York, USA

## Overview

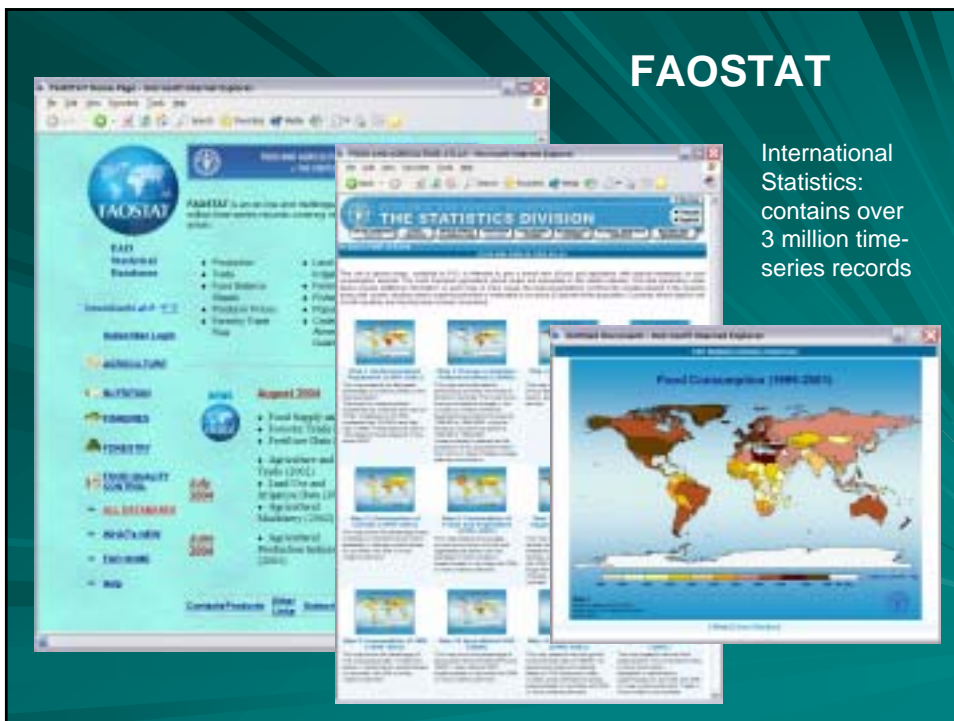
- Comprehensive overview of selected initiatives
  
- What do we mean by “global”
  - available for the whole globe
    - aggregated to coarse resolution
  - global coverage of finer resolution data

# Global Datasets

- What do we mean by global data?
  - scope of information
  - geographical coverage
  - spatial resolution
  - temporal resolution
  - data type (point, polygon, raster)
  - degree of processing
  - data sources
  - target audience

## Typology of “Global Datasets”

- Target User Groups
  - Global Modelers to Local Users
- Scale / Spatial Resolution
  - Globally-aggregated vs. Global Coverage
- Temporal Dimension
  - Real Time – Early Warning – Disaster Relief
  - Long-term – LUCC – Change Detection
  - Current Status or Static vs. Dynamic / Periodic Update
    - e.g. DEM's vs. population growth



## FAOSTAT

International Statistics:  
contains over  
3 million time-series records

# GeoNetwork

FAO's Portal for collecting, hosting and sharing georeferenced thematic information.

Provides a common metadata structure and search facility through which geographic (map) outputs can be searched for and downloaded by users.

SIMAG:  
Spatial Information  
Management Advisory Group



# FEWS-NET



DEPHA:  
Data Exchange Platform  
for the Horn of Africa

# FIVIMS

Interagency initiative to promote information and mapping systems on food insecurity and vulnerability.

Provides social indicators, especially as they relate to food security, such as access to safe water and various poverty measures.

Partner in PovertyMap.net



# GIEWS Workstation

Global Information on Early Warning –

Provides assessment of the current year against other known years – particularly in relation to drought.

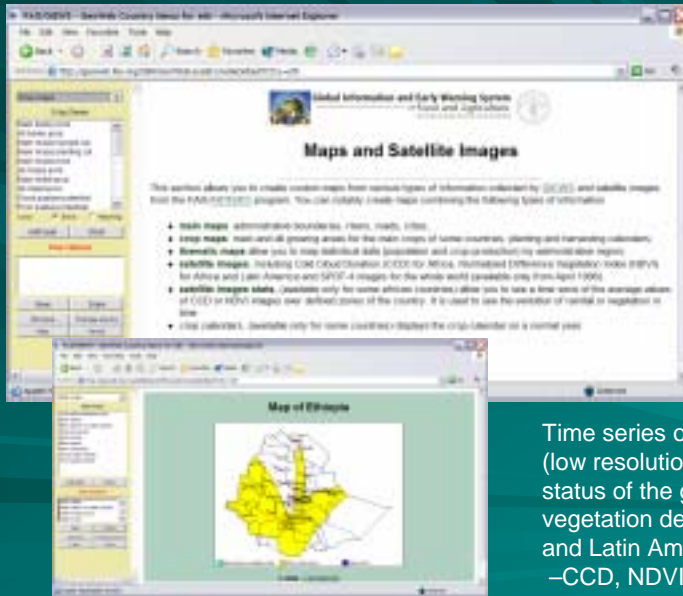
Works thru GeoWeb and GeoNetwork

KIDS Toolbox:

Key Indicator Display System



## ARTEMIS: Africa Real Time Environmental Monitoring System



Time series of satellite images (low resolution) showing the status of the growing season and vegetation development in Africa and Latin America  
 –CCD, NDVI and SPOT-4

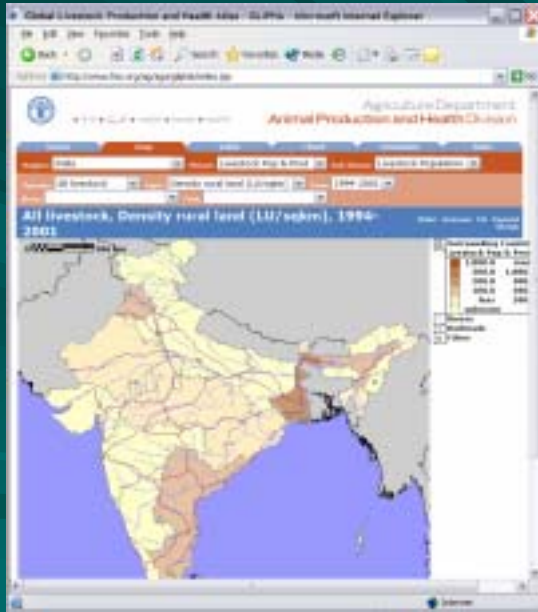
## Agro-MAPS: Global Spatial Database of Sub-national Agricultural Landuse Statistics



Currently contains data on crop production, area harvested and crop yields, for one or more years for each country

Agro-MAPS Explorer – facilitate selective retrieval of data from the full Agro-MAPS database.

## GLiPHA – Global Livestock Production and Health Atlas



Scalable overview of spatial and temporal variation of quantitative information related to animal production and health, through the combination of maps, tables, and charts.

Data themes included are:

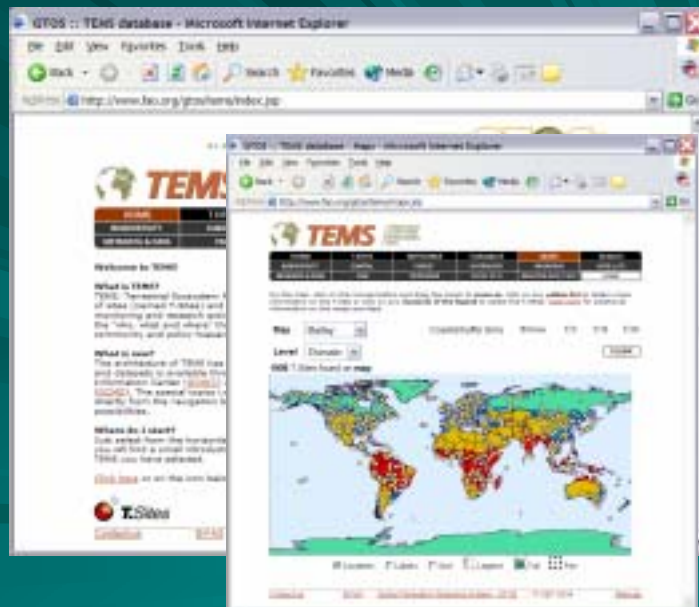
- biophysical
- socioeconomic
- livestock population
- livestock production
- animal health
- trade

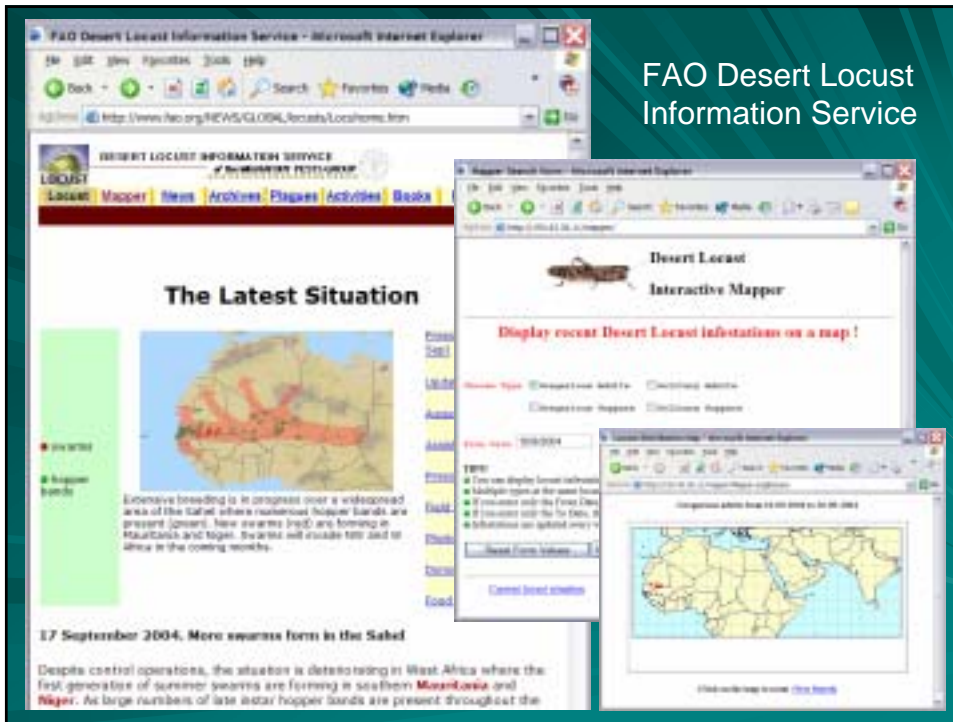
## GTOS – TEMS – Terrestrial Ecosystem Monitoring Sites

Directory of sites collecting long-term data on geo-physical variables.

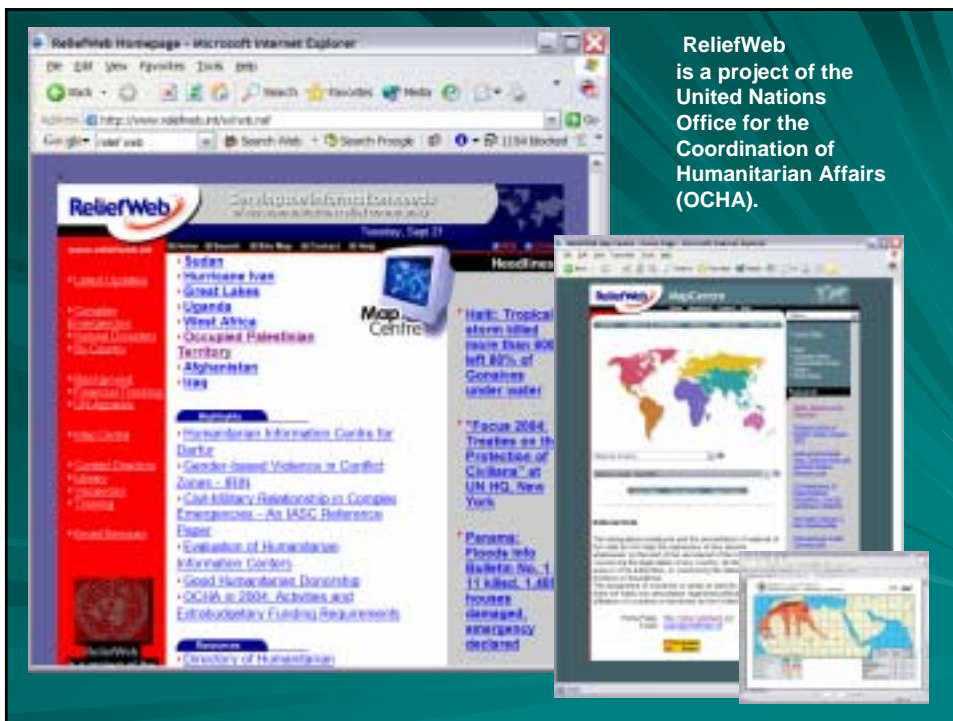
About 300 indicator variables.

Also allows users to map where stations are in terms of, for example, agro-ecological zones.





FAO Desert Locust Information Service

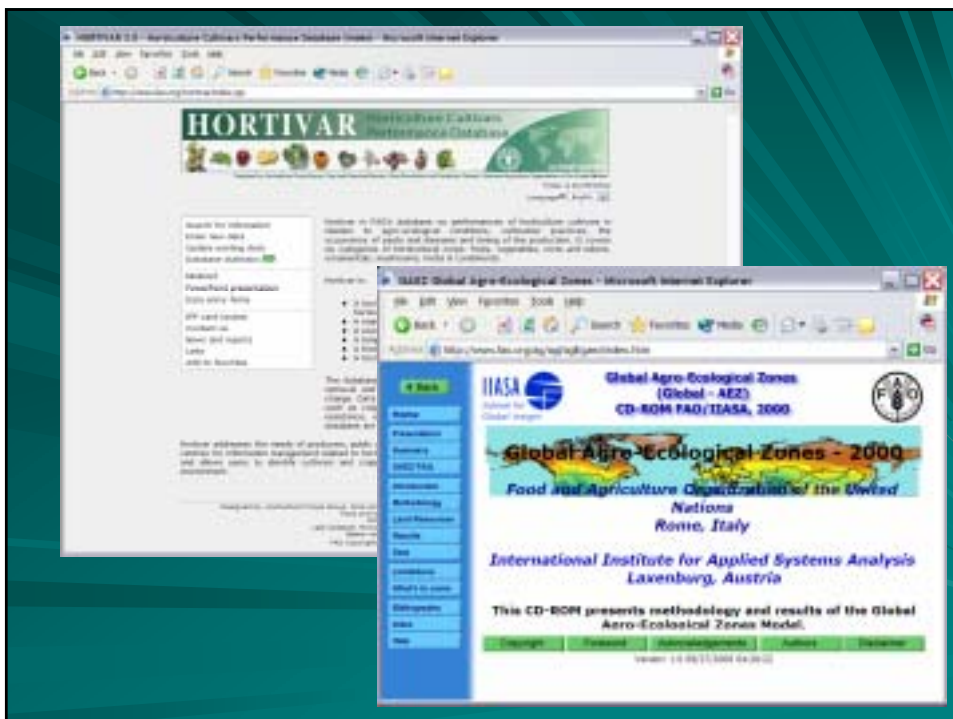
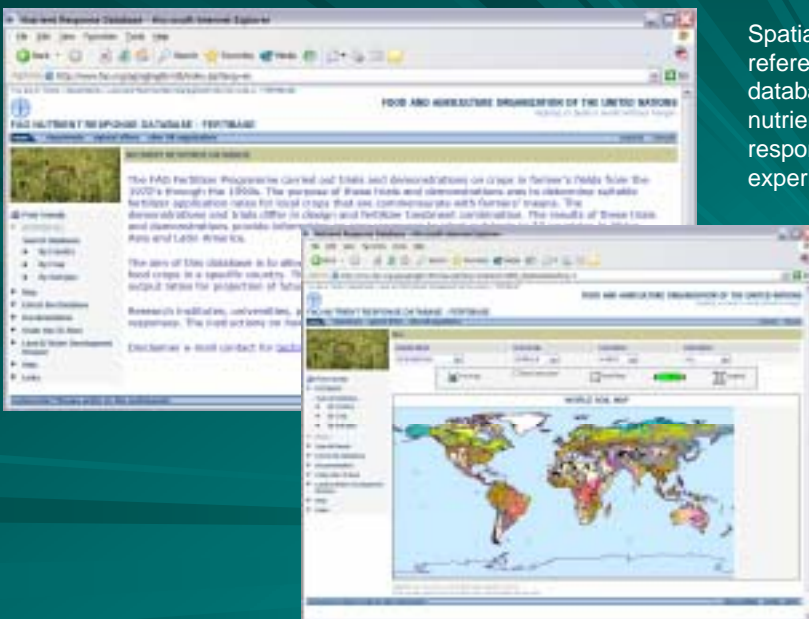


ReliefWeb is a project of the United Nations Office for the Coordination of Humanitarian Affairs (OCHA).




# FAO Nutrient Response Database

Spatial referenced database of nutrient response experiments.



## AQUASTAT: FAO's Information System on Water and Agriculture



The screenshot shows the AQUASTAT website interface. The main heading is 'AQUASTAT' under the 'Land and Water Development Division' of the 'FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS'. Below this, there is a section titled 'Maps and GIS' which lists various data layers available for users to view on a map, such as 'Irrigated areas', 'Water resources', and 'Agriculture'. The text in the screenshot states: 'This section contains spatial information related to the field of water resources and irrigation. It consists of maps, demographic spatial datasets, and background documentation on how the spatial information has been obtained in order to create the following subjects:'. A list of subjects follows, including 'Irrigation', 'Water resources', 'Agriculture', and 'Water use efficiency'.

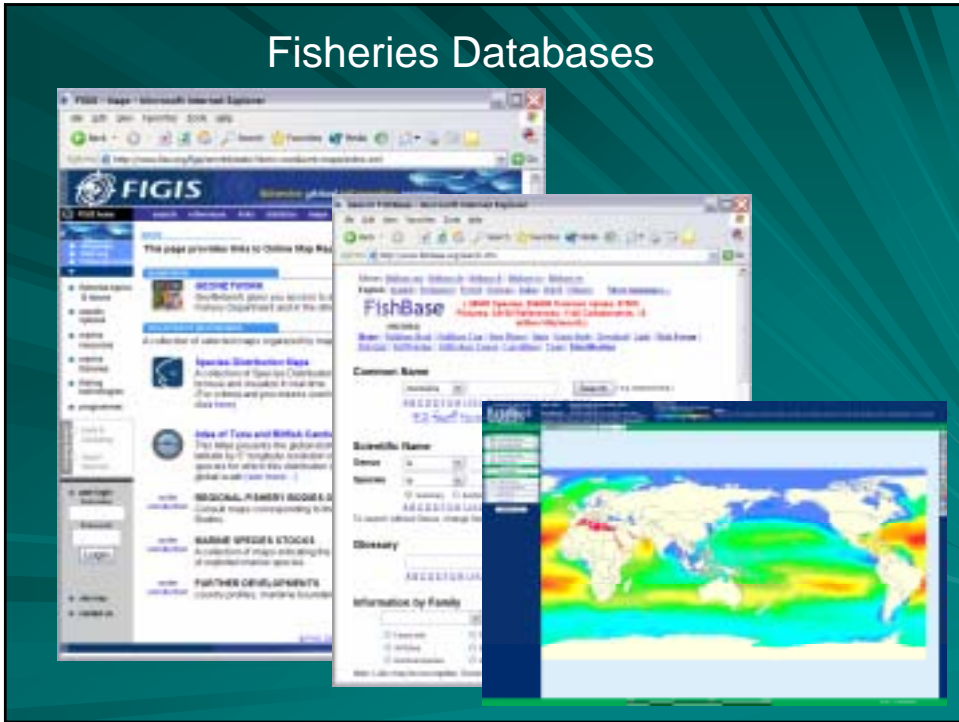
Comprehensive information on the state of agricultural water management worldwide

Many maps of water resources available, e.g. Global Map of Irrigated Areas



The screenshot shows the SDdimensions website. The main heading is 'SDdimensions' with a sub-heading 'FAOCLIM, a CD-ROM with world-agriclimatic data'. Below this, there is a section titled 'World Water & Climate Atlas' which describes the atlas as a 'World Water and Climate Atlas gives irrigator and agricultural planner insight into accurate data on climate and moisture availability for agriculture'. The text further states: 'The Atlas includes monthly and 5 annual summaries for precipitation, temperature, humidity, hours of sunshine, evaporation, transpiration, wind speed, total number of days with wet and/or humid, days without frost and Palmer-Moisture Index & Moisture Equivalency Index'. It also mentions: 'The core of the Atlas is data assembled from over 2000 stations for the period 1950-1999. Data is extracted in a standardized format for user or other users can also include their own local data for a particular area'. Applications include: 'identifying areas suitable for rainfall agriculture', 'determining how much irrigated or humid what the climate provides', 'providing inputs for hydrologic or modeling', and 'extracting climate inputs for crop modeling'. The bottom of the page says 'For more information on the Atlas follow the links'.

# Fisheries Databases



# Foris WebView – Global Forest Resources Assessment

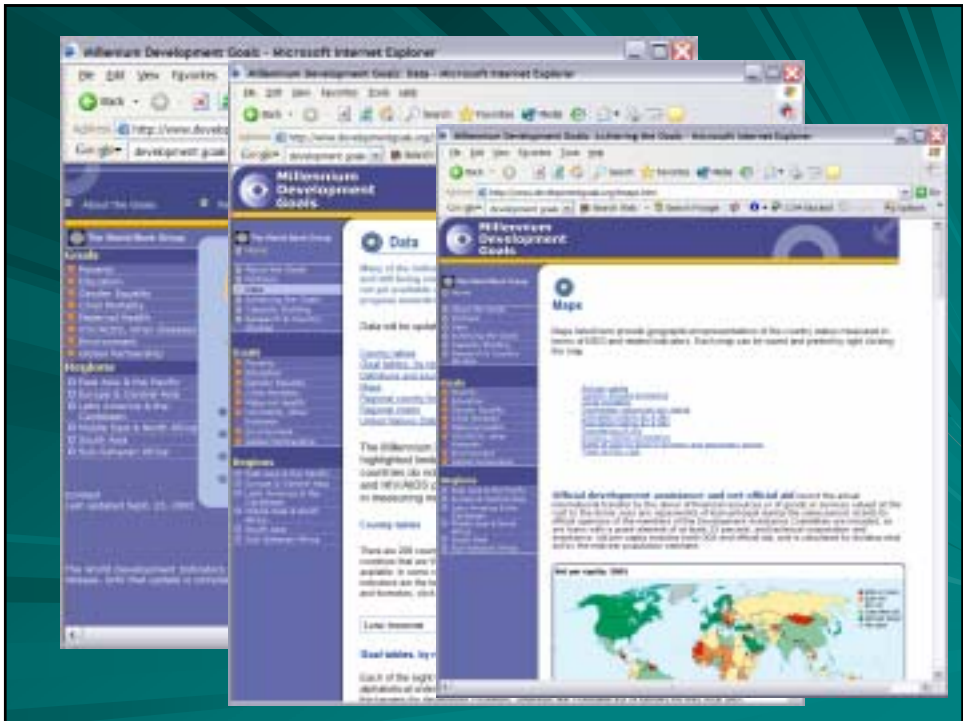


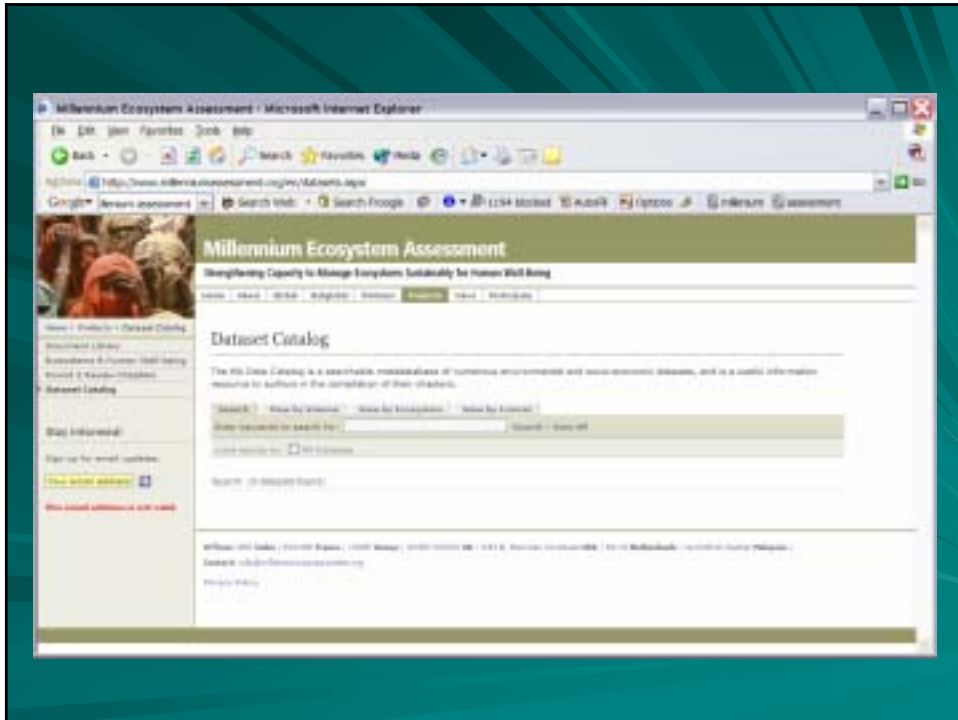
# UNEP.NET

# CIESIN and SEDAC

Title	Author	Keywords
Agri-Value-1985-1995	John A. Foley, Jeffrey E. Johnston, Jeffrey E. Johnston	Global, Agriculture
Agri-Value-1990-1995	John A. Foley, Jeffrey E. Johnston, Jeffrey E. Johnston	Global, Agriculture
Agri-Value-1995-2000	John A. Foley, Jeffrey E. Johnston, Jeffrey E. Johnston	Global, Agriculture
Agri-Value-2000-2005	John A. Foley, Jeffrey E. Johnston, Jeffrey E. Johnston	Global, Agriculture
Agri-Value-2005-2010	John A. Foley, Jeffrey E. Johnston, Jeffrey E. Johnston	Global, Agriculture
Agri-Value-2010-2015	John A. Foley, Jeffrey E. Johnston, Jeffrey E. Johnston	Global, Agriculture
Agri-Value-2015-2020	John A. Foley, Jeffrey E. Johnston, Jeffrey E. Johnston	Global, Agriculture
Agri-Value-2020-2025	John A. Foley, Jeffrey E. Johnston, Jeffrey E. Johnston	Global, Agriculture
Agri-Value-2025-2030	John A. Foley, Jeffrey E. Johnston, Jeffrey E. Johnston	Global, Agriculture
Agri-Value-2030-2035	John A. Foley, Jeffrey E. Johnston, Jeffrey E. Johnston	Global, Agriculture
Agri-Value-2035-2040	John A. Foley, Jeffrey E. Johnston, Jeffrey E. Johnston	Global, Agriculture
Agri-Value-2040-2045	John A. Foley, Jeffrey E. Johnston, Jeffrey E. Johnston	Global, Agriculture
Agri-Value-2045-2050	John A. Foley, Jeffrey E. Johnston, Jeffrey E. Johnston	Global, Agriculture
Agri-Value-2050-2055	John A. Foley, Jeffrey E. Johnston, Jeffrey E. Johnston	Global, Agriculture
Agri-Value-2055-2060	John A. Foley, Jeffrey E. Johnston, Jeffrey E. Johnston	Global, Agriculture
Agri-Value-2060-2065	John A. Foley, Jeffrey E. Johnston, Jeffrey E. Johnston	Global, Agriculture
Agri-Value-2065-2070	John A. Foley, Jeffrey E. Johnston, Jeffrey E. Johnston	Global, Agriculture
Agri-Value-2070-2075	John A. Foley, Jeffrey E. Johnston, Jeffrey E. Johnston	Global, Agriculture
Agri-Value-2075-2080	John A. Foley, Jeffrey E. Johnston, Jeffrey E. Johnston	Global, Agriculture
Agri-Value-2080-2085	John A. Foley, Jeffrey E. Johnston, Jeffrey E. Johnston	Global, Agriculture
Agri-Value-2085-2090	John A. Foley, Jeffrey E. Johnston, Jeffrey E. Johnston	Global, Agriculture
Agri-Value-2090-2095	John A. Foley, Jeffrey E. Johnston, Jeffrey E. Johnston	Global, Agriculture
Agri-Value-2095-2100	John A. Foley, Jeffrey E. Johnston, Jeffrey E. Johnston	Global, Agriculture

# World Bank Development Gateway





## Global Land Cover Facility

University of Maryland

Develops and distributes remotely sensed satellite data and products concerned with land cover from the local to global scales.

27,475 Landsat scenes

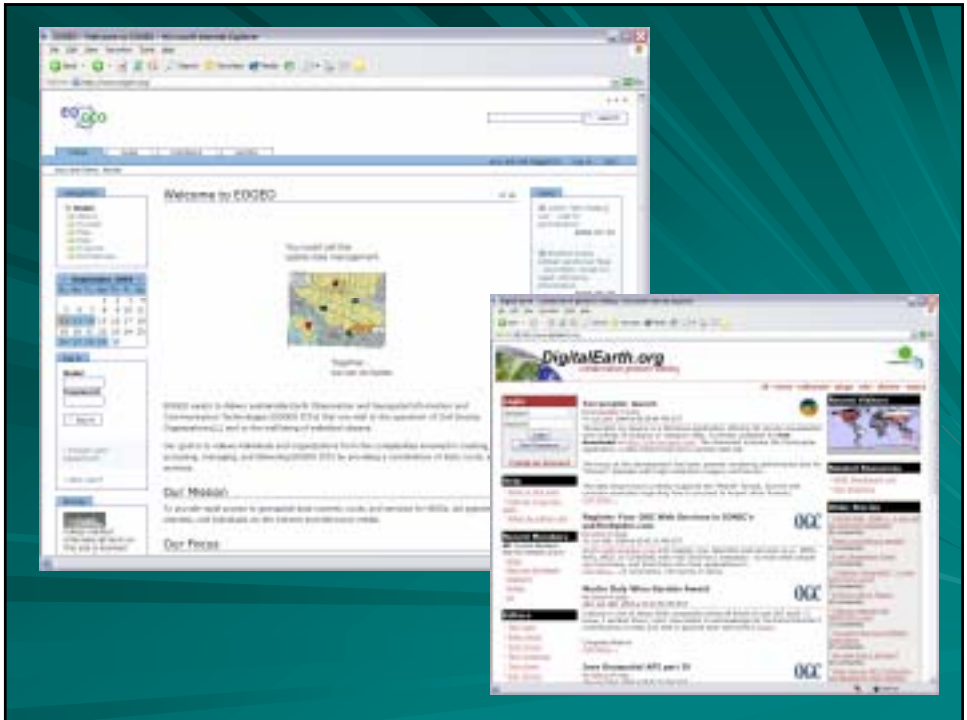
- orthorectified (georeferenced)
- 1990 and 2000

GeoCover

- georeferenced
- mosaiced
- Mr. Sid format

MODIS NDVI





***GeoSpatial Science for a Sustainable Future***



The figure shows a world map with several red dots indicating the locations of member institutions. A central text box contains the CGIAR-CSI logo and the name of the consortium. A contact email address is provided at the bottom.

**CGIAR – CSI**  
**Consortium for Spatial Information**

Contact: [csi@cgiar.org](mailto:csi@cgiar.org)





# Strategic Initiatives

- Six high priority areas identified,
  - with their respective coordinating centers:
    - Coordinated data management and tools (IWMI)
      - ICT/KM Project
    - Geographic dimensions of crop varieties (CIMMYT)
    - Impact assessment and policy research (IFPRI)
    - Natural resource degradation (ICARDA)
    - Integration, training, capacity building, with NARES (CSI)
    - Poverty mapping (CIAT)
      - PovertyMap Project

## GASSIA Workshop Follow-up: GASSIA – Africa (March 2005)

Geospatial Applications to Support Sustainable International Agriculture

GASSIA Workshop Report  
U.S. Geological Survey/RSIS Data Center  
Sioux Falls, South Dakota, USA  
May 18-21, 2002

Future Directions for Agriculture

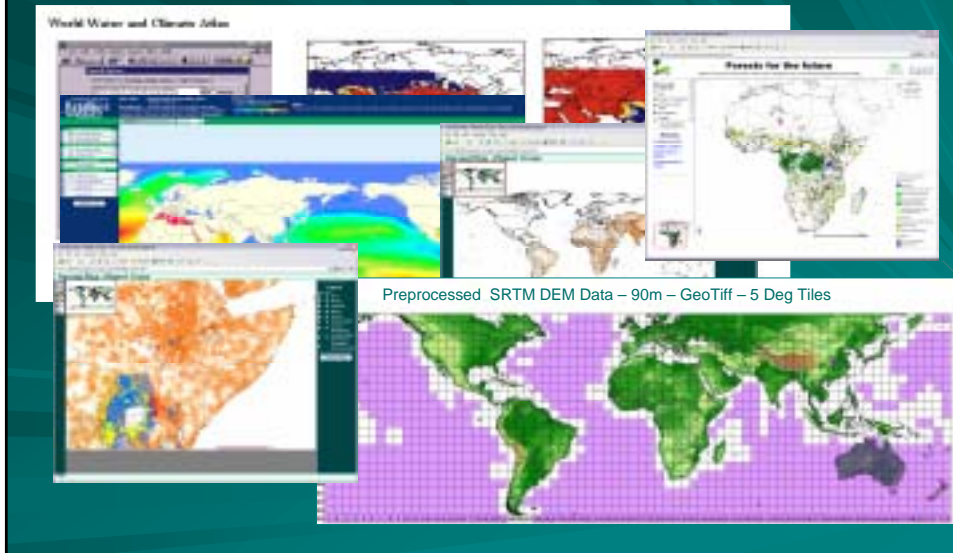
Sustainable Farming in Fragile Ecosystems

RAISE

RSIS

NARS DIRECTORIES FOR AGRICULTURE

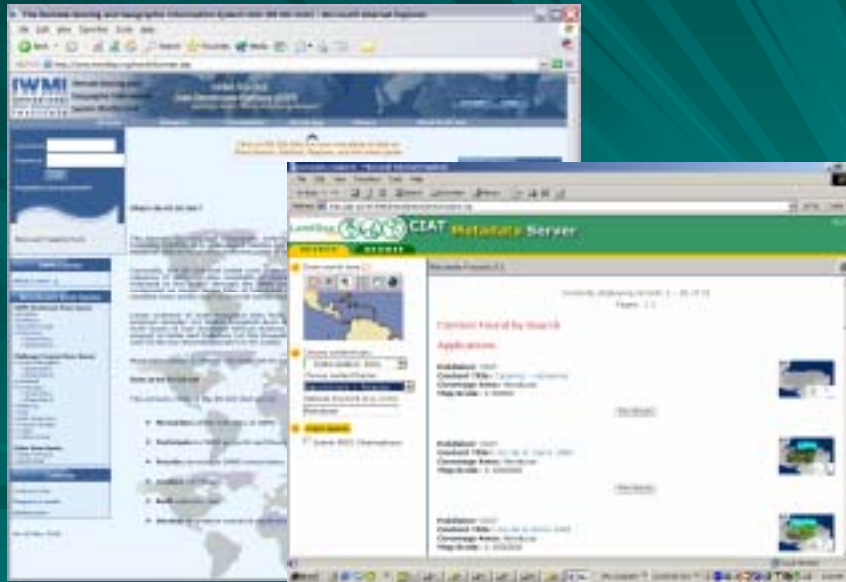
## CGIAR-CSI Regional and Global Datasets



## CGIAR-CSI GeoPortal MultiCenter MapServer and Data Sharing Platform

- CGIAR-CSI –GeoPortal,
  - A central access point CGIAR geo-spatial data and tools.
  - GeoSpatial Data and Spatial Tool Sharing Platform
- CGIAR GeoSpatial “InfoFinder” – Meta-data inventory
  - Full set of metadata for CGIAR geospatial data
  - Facilitate dissemination of GPG’s
- CGIAR Multi-Center MapServer - GeoPortal
  - Assemble and make available a selected set of geospatial datasets for non-expert users
  - Demonstrate advanced ICT/KM spatial analysis capabilities,
  - Multi-Center analytic capability based upon a distributed database architecture.

## GeoSpatial Info-finder



## Significant Gaps

- Farming / Production systems
  - “LCCS” type hierarchical classification system
  - small farms methodology
  - dis-aggregation of the “mixed farming” category
- Global Irrigated Areas Mapping
  - spatial disaggregated country stats
  - actually mapping (e.g. remote sensing)
  - accounting for small irrigation systems

# Most Significant Gap

## ■ Missing Link:

- Capacity at the National / Local Level
- Perceived demand at both ends of the user spectrum
- Allow national partners to manage their own resources

## ■ Bridging the “GeoSpatial Digital Divide”

- Creation of a viable, sustainable, and healthy, two-way interactive data exchange and information flow across scales

### Geospatial One-Stop E-Gov Initiative

Operating Philosophy:

Two-clicks to the data.

We're still not there,  
but this is where we  
should be headed.





Thank You...

For further information, contact:  
Robert Zomer – CGIAR-CSI Global Coordinator  
[csi@cgiar.org](mailto:csi@cgiar.org)