

Geospatial Science & Technology for Sustainable Development in Africa: Partnerships and Applications

Harvard University

John F. Kennedy School of Government

May 28 -29, 2009

Panel 1: Government Initiatives & Partnerships—

Maxine Levin, US Department of Agriculture
Natural Resources Conservation Service



USDA International Activities in Sustainable Agriculture--AFRICA

- Primarily Domestic Programs and agencies
- Work through USAID and USDA Foreign Agricultural Service (FAS)
 - NRCS World Soil Resources Program
 - CSREES International Program/Guide to USDA Programs
 - USFS International Program—Forest Health monitoring
 - Land Grant University and Agency Scientific Exchanges



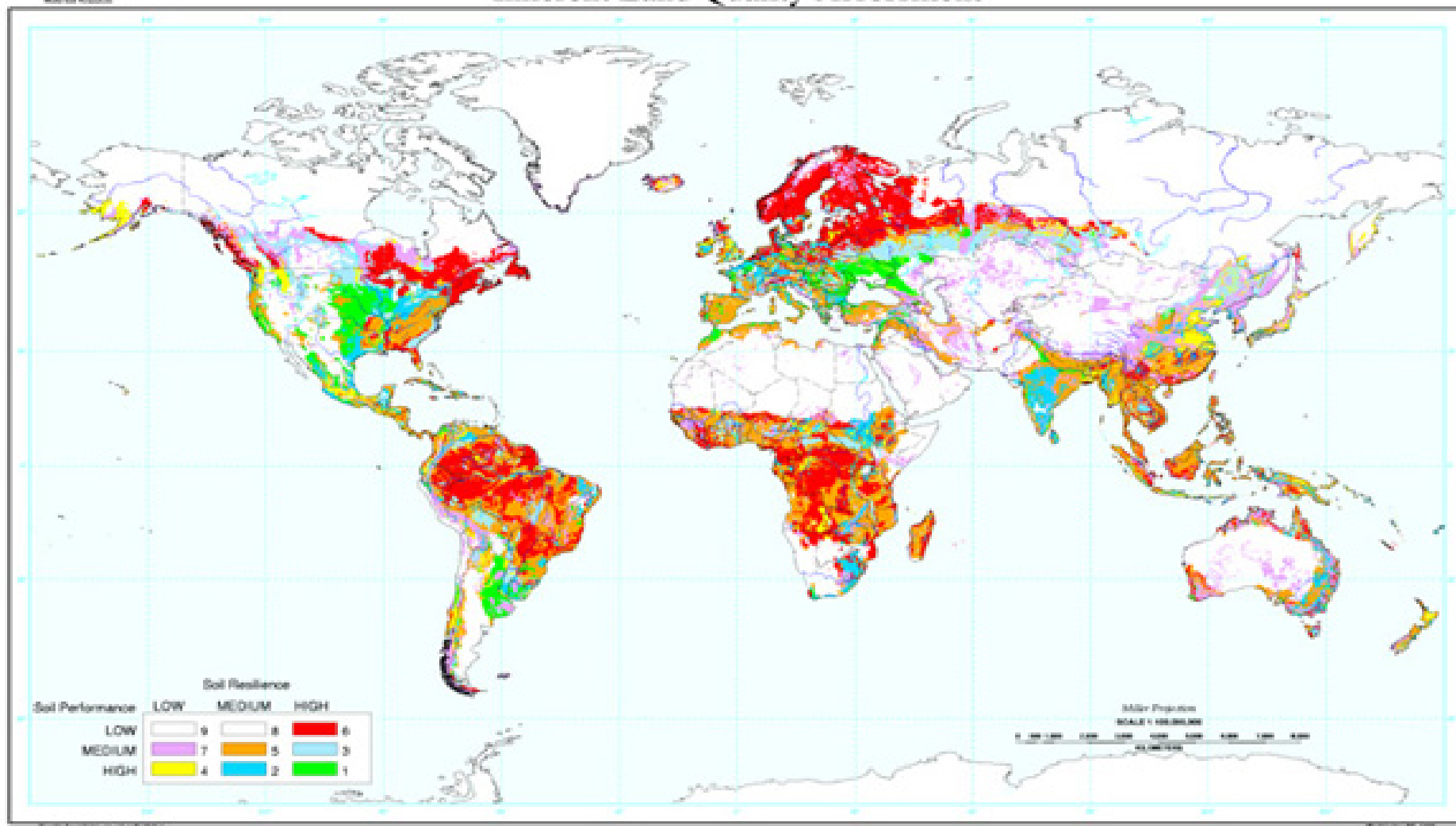
NRCS World Soil Resources

Natural Resources / Agriculture Links

- [Africa Data Dissemination Service](#) (ADDS)
A source for digital environmental information on Africa.
- [International Soil Reference and Information Centre](#)
ISRIC is a foundation for documentation, research and training about the soils of the world with emphasis on developing countries.
- [Consortium for International Earth Science Information Network](#)
CIESIN - global and regional network development and science data management.
- [The GLOBE Program](#)
GLOBE is a worldwide hands-on primary and secondary school-based education and science program.
- [GlobalSoilMap.net](#)
Initiative to create a new digital soil map of the world.



Inherent Land Quality Assessment

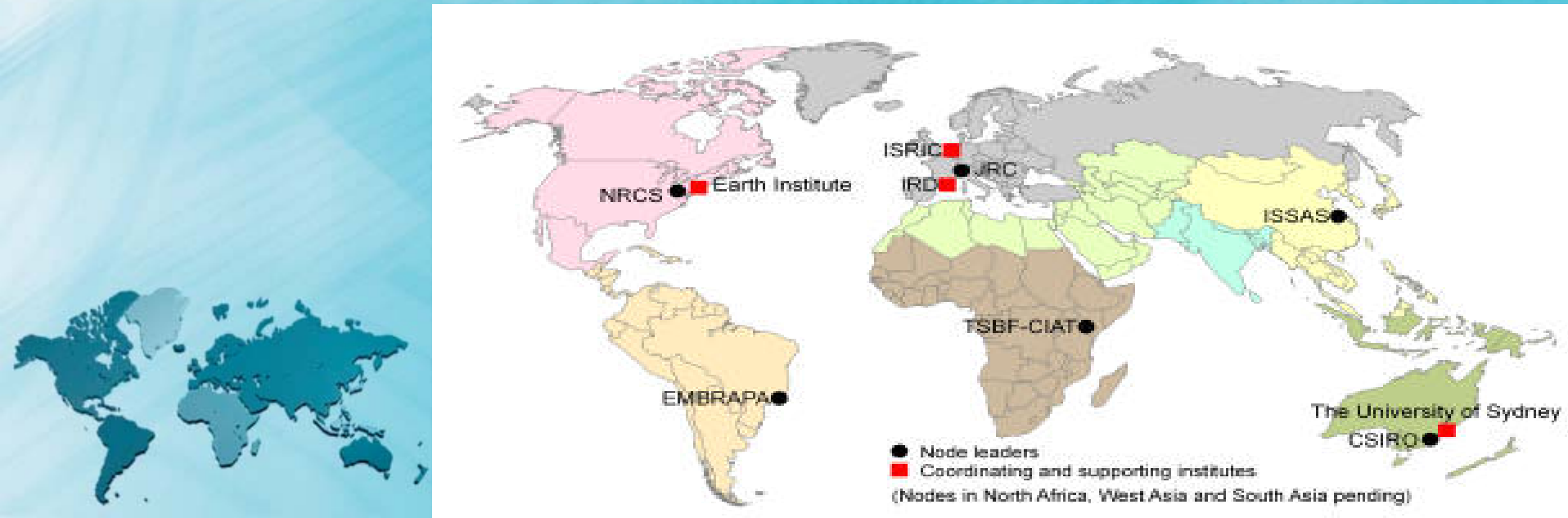


<http://soils.usda.gov/use/worldsoils/mapindex/>



GlobalSoilMap.net

- Sub-Saharan Africa – Tropical Agriculture Program of the Earth Institute at Columbia University (EI), World Agroforestry Centre (ICRAF), Tropical Soil Biology and Fertility Institute (TSBF-CIAT), and CIESIN/Earth Institute of Columbia University





CSREES Global Initiative

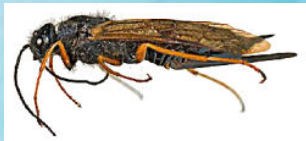
Guide to USDA's International Programs

- A [Guide to USDA's International Programs](http://www.csrees.usda.gov/nea/international/pdfs/vis_guide.pdf) is a clearinghouse of information on international programs and activities within the USDA of potential interest to staff at land grant institutions.
- http://www.csrees.usda.gov/nea/international/pdfs/vis_guide.pdf



USFS International—Africa

- **The African Leadership Seminar on People and Conservation** is an intensive one week program held in southern Africa, University of KwaZulu-Natal 's Centre for Environment, Agriculture and Development Fall 2009
- 2008 Forest Health Monitoring in the Ngangao Forest, Taita Hills, Kenya: - A Five Year Assessment of Change (Rogers, Paul C.; et al)
- 2007 South Africa International Sirex Symposium & Workshop, May 9-16, 2007
- 2006, 2005 Malawi and Tanzania Invasives- Chilima, Dr. C.Z
- 2003 Monitoring for Sustainable Forests and Biodiversity in the Eastern Arc Mountains of Kenya and Tanzania (Dull, Charles; and James D. "Denny" Ward)



Foreign Agricultural Service (FAS)

FAS offers a wide range of technical assistance, education and outreach programs for emerging markets and developing countries that are designed to support the development of science-based regulatory policies and promote food security.

- Trade and Scientific Exchanges
- Cochran Fellowship Program
- Norman E. Borlaug International Agricultural Science and Technology Fellows Program -Global Cocoa Initiative for Africa
- Embassy Science Fellows
- Agricultural Science and Technology cooperation with Universities



« Coffee of the Thousand Hills »

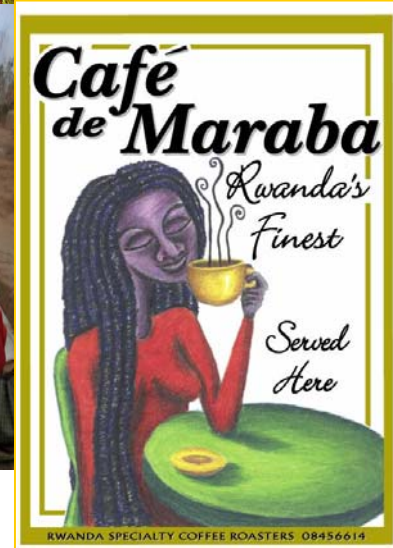
The Use of GIS for the Determination of Rwanda Coffee Appellation Regions

- 1) Developing GIS based marketing and traceability support models and tools to small and medium coffee producers, export and import companies
- 2) In order to provide the coffee sector with discrete “branding” parameters to increase consumer recognition thus increasing the value of Rwandan coffees

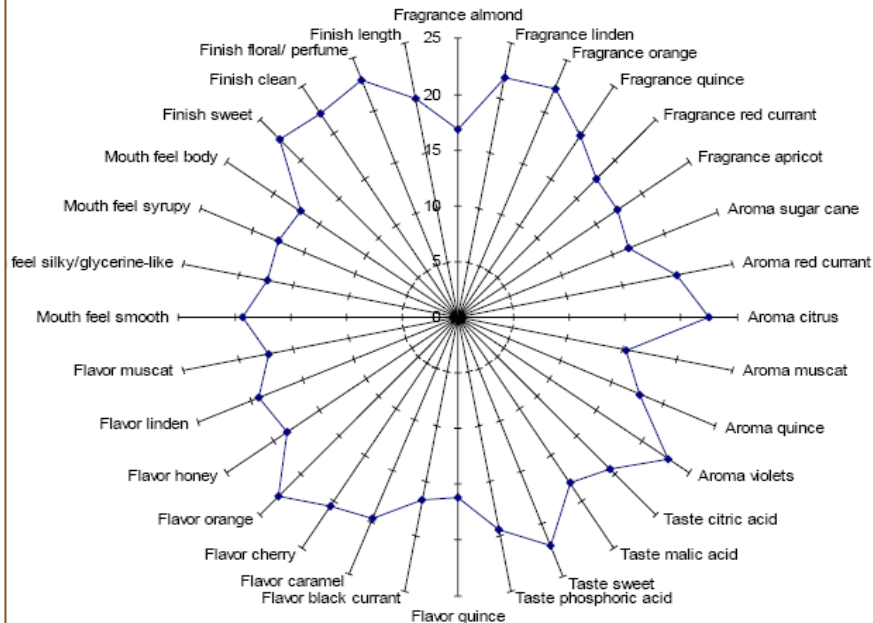
- At the FAO Agribusiness conference in June, the Coffee project won the Best Prize for Rwanda



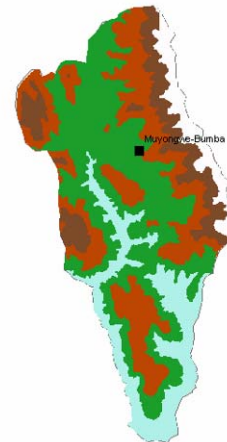
Selling brands to
satisfy the consumer
tastes



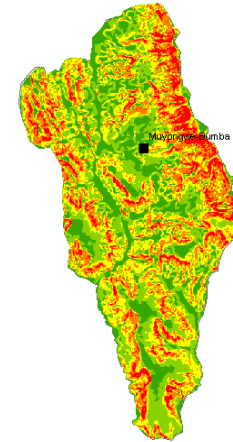
Sensory Profile: North Sample



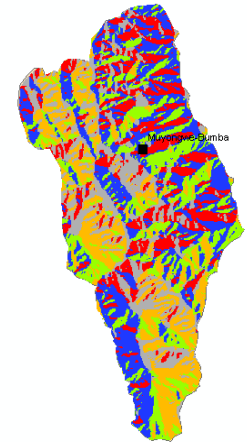
Elevation



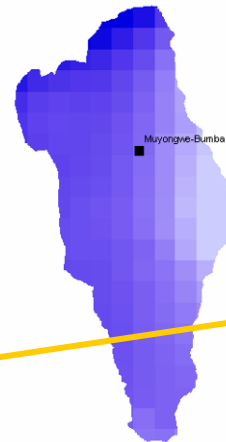
Slope



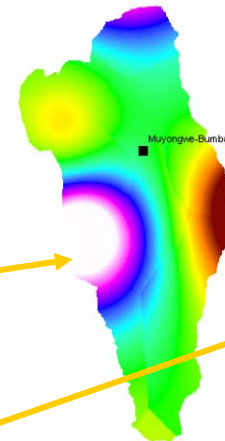
Aspect



Rainfall (mm)



Temp



Soil



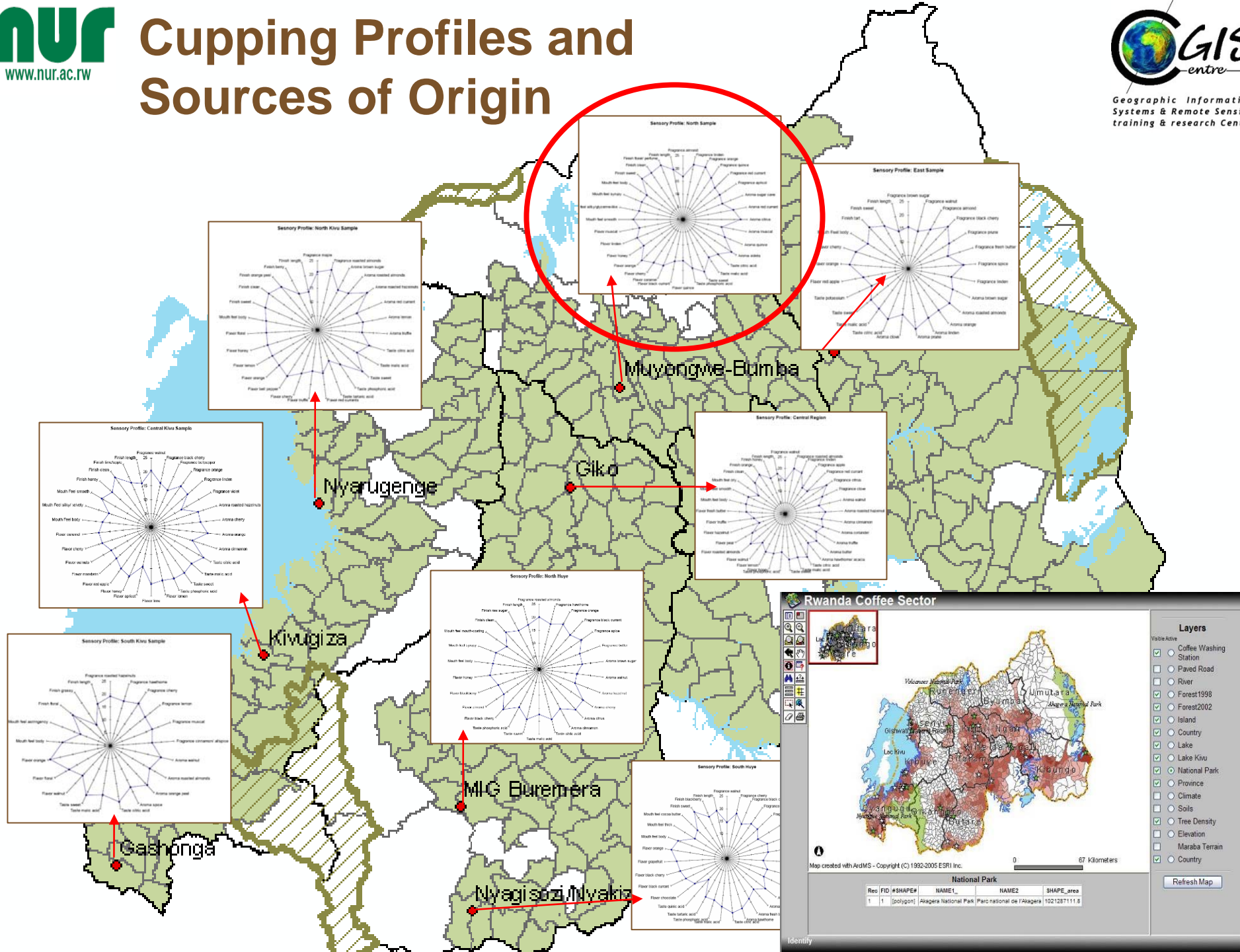
Data available

- **Flavorance**
- **Aroma**
- **Taste**
- **Flavor**
- **Mouth feel**
- **Finish**
- **Service area**
- **Climate:**
temperature,
Humidity, Rainfall,
Evaporation
- **Soil**
characteristics:
soil PH, C/N, Mg,

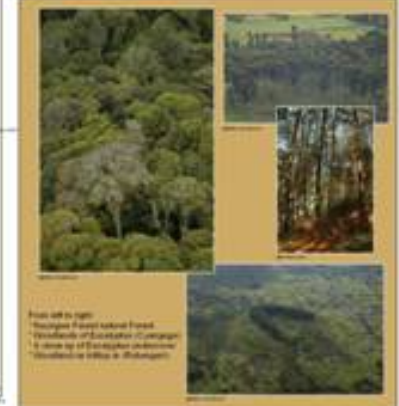
Determination of
flavor profile



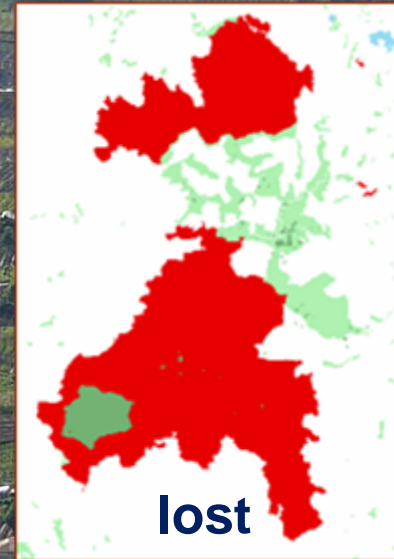
Cupping Profiles and Sources of Origin



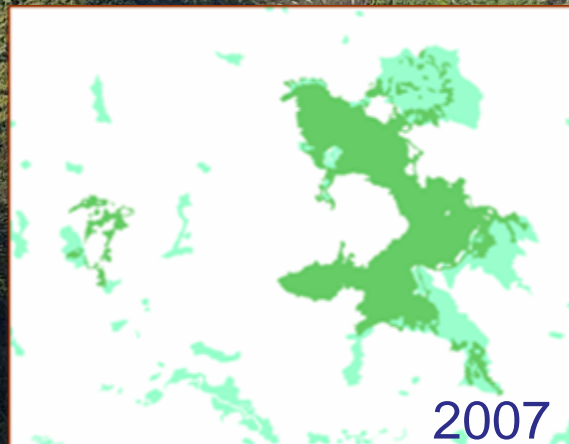
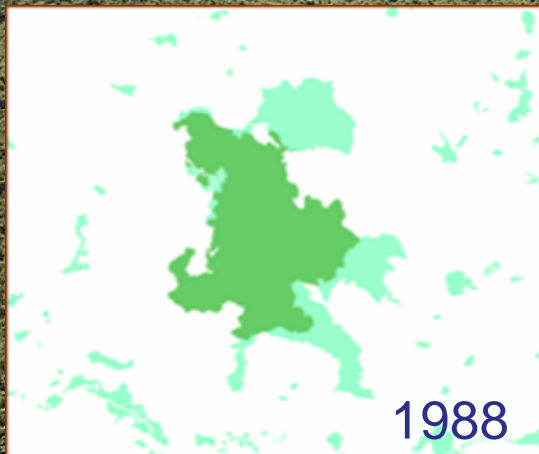
Forest change mapping



Gishwati Natural Reserve



Mukura Forest



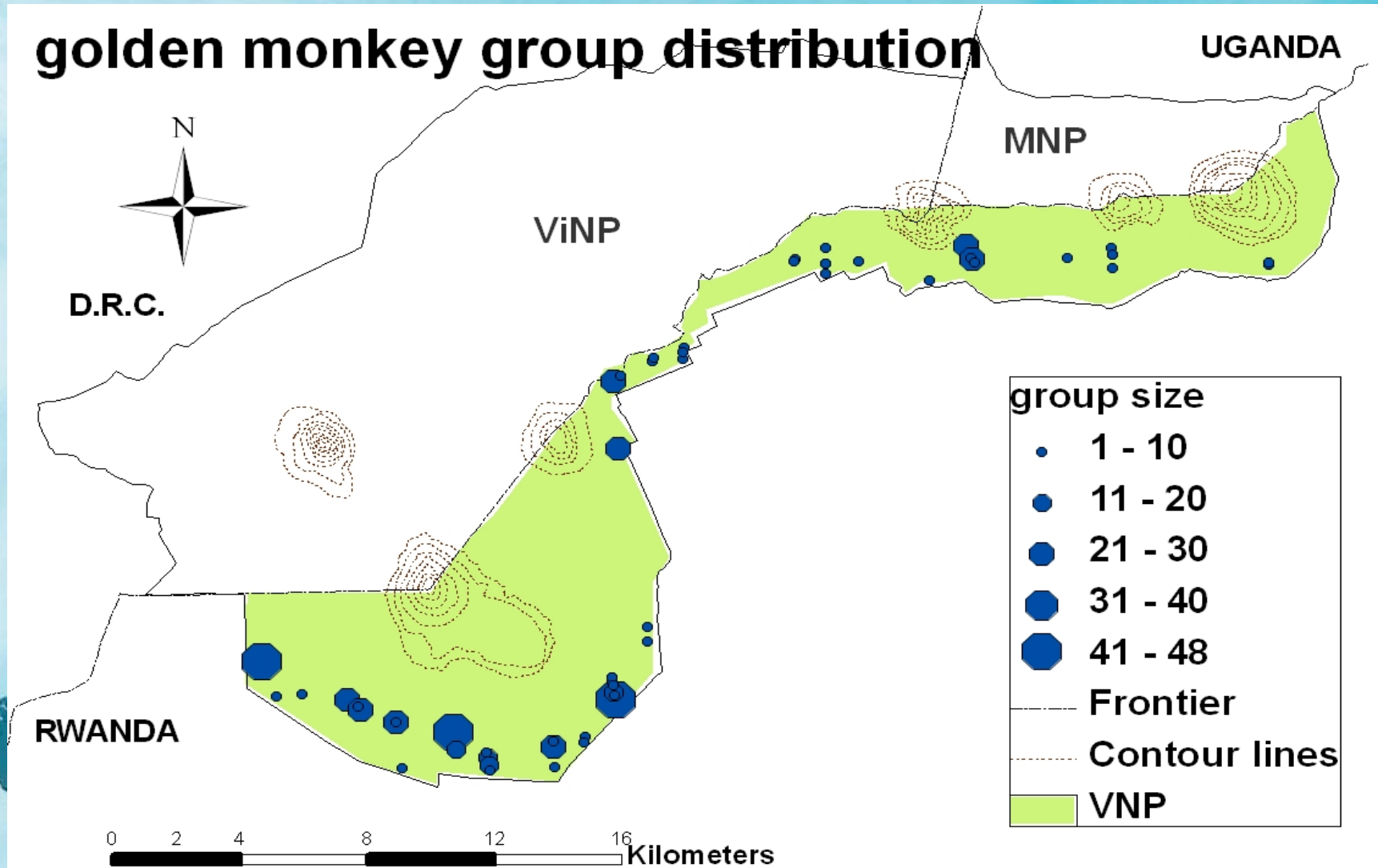
Geo-Data Portal

Data Sharing between Data Stewards

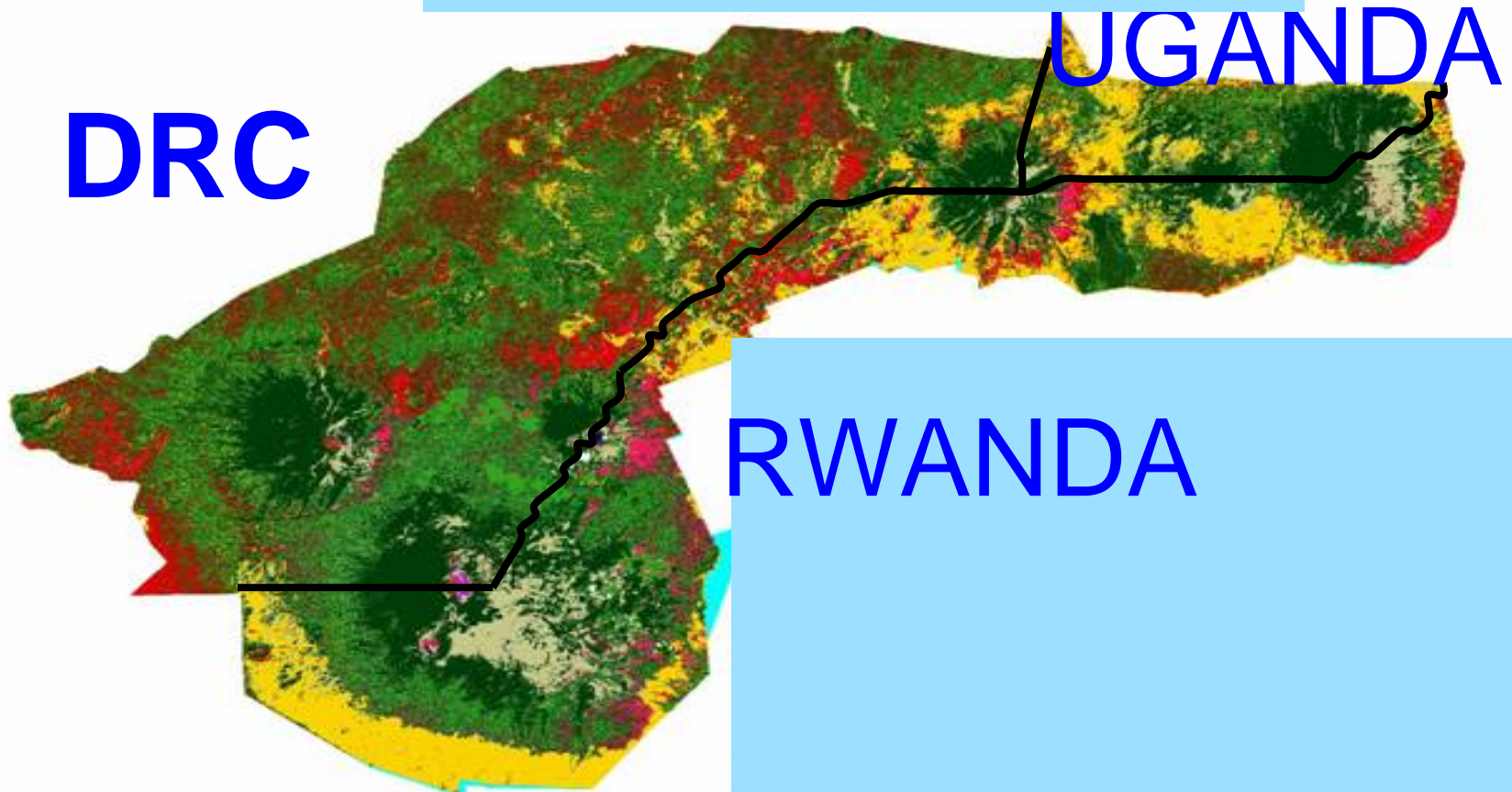


Results

- All 60 social groups were detected within bamboo zone

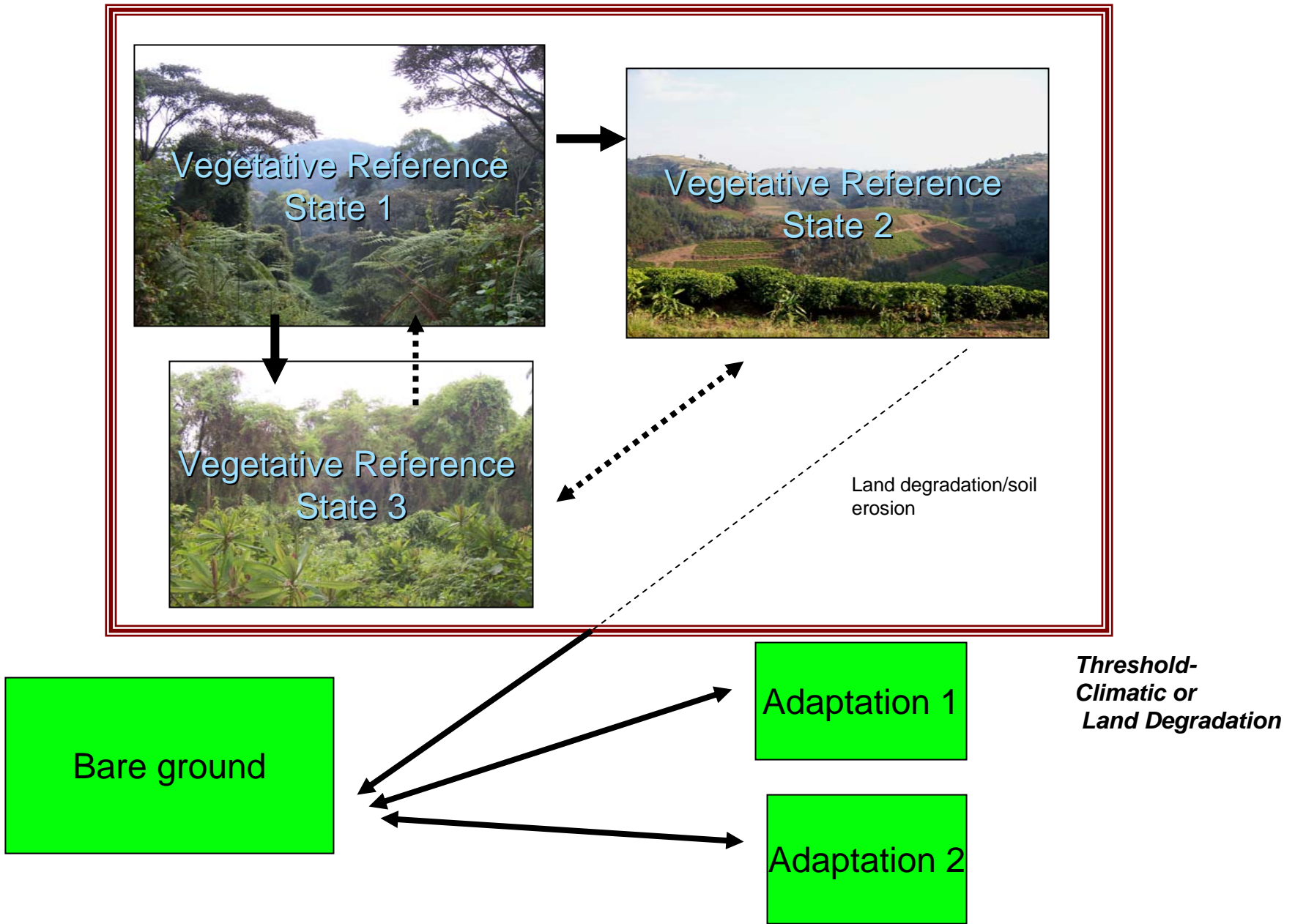


All monkeys were recorded from the bamboo zone



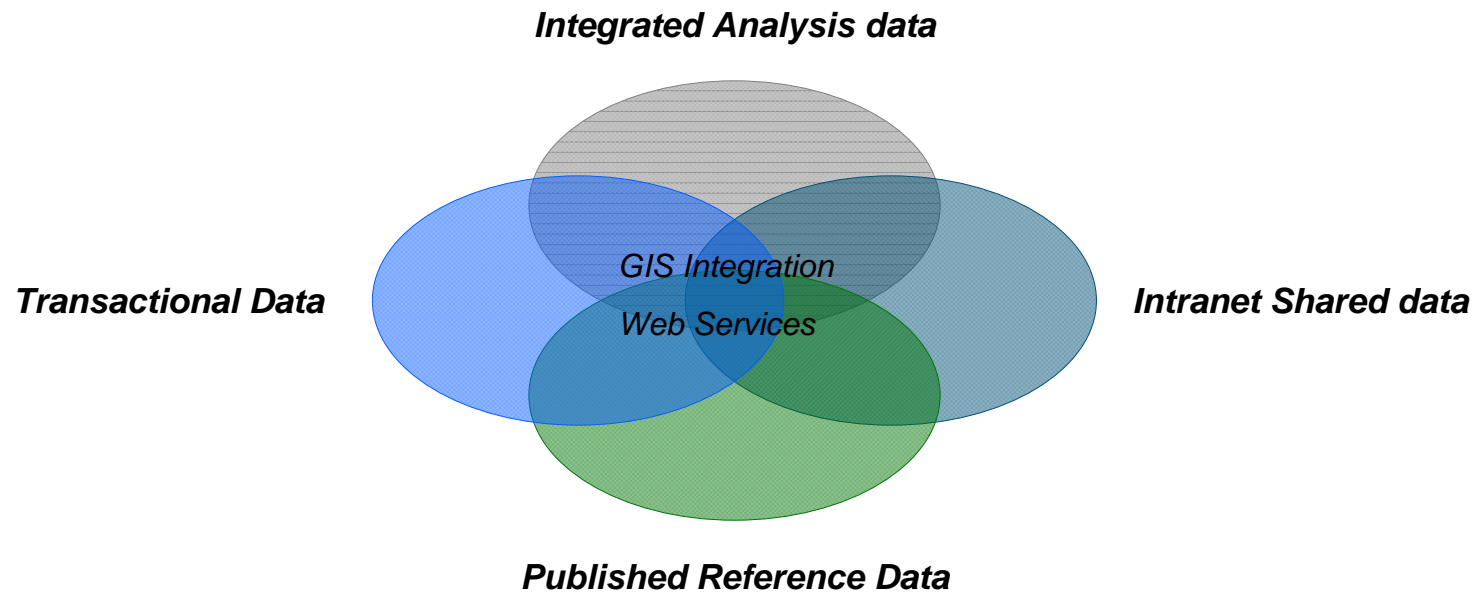
Climate Change Adaptation Strategy

State and Transition Model for Ecological Site Descriptions



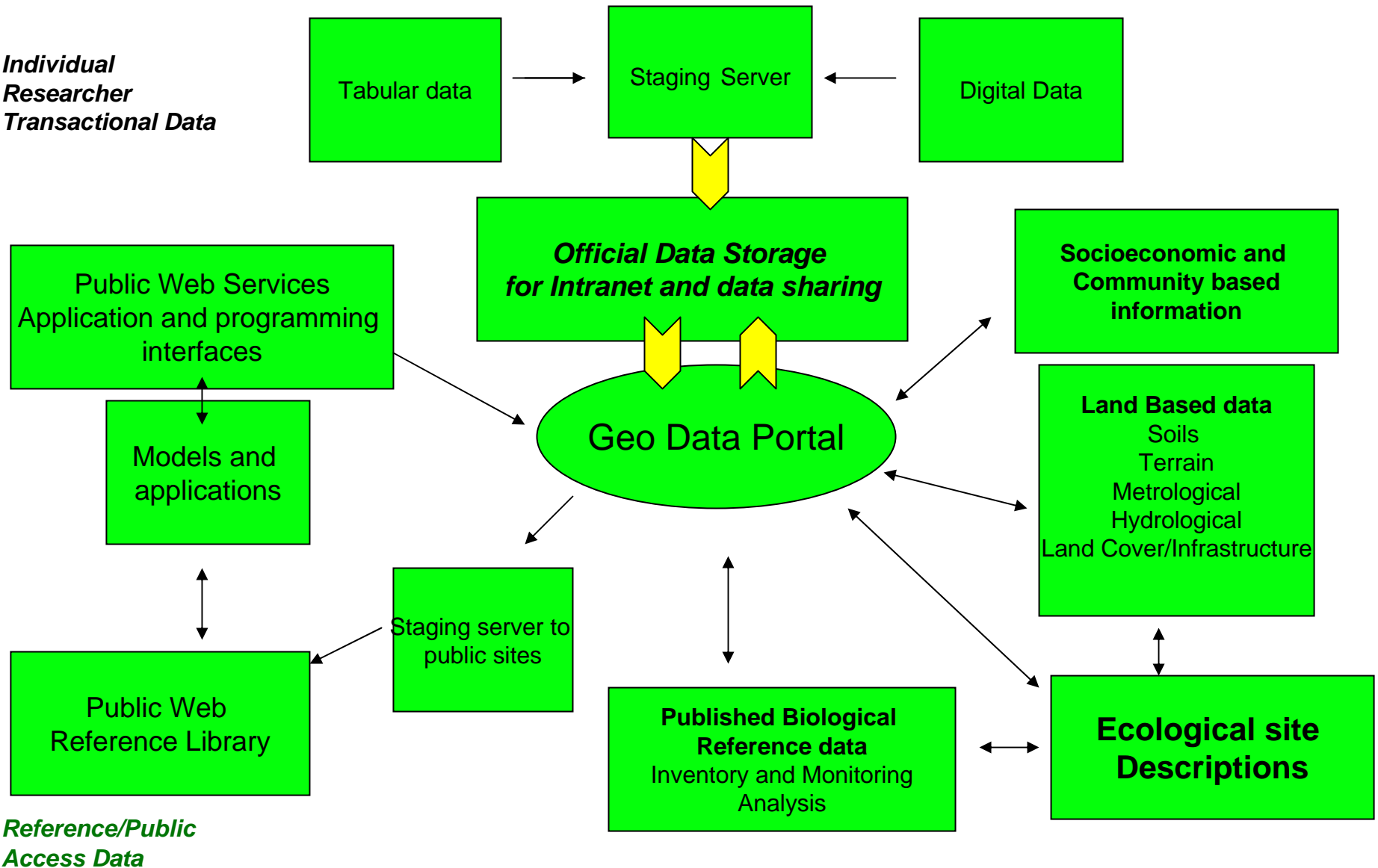


BioInformatics Open Platform



Proposed Data Flow Infrastructure for Open Platform Bioinformatics

*Individual
Researcher
Transactional Data*



Summary-

Areas for Partnership and Collaboration

- Life Cycle Analysis—GIS Applications
- Capacity Building
- Natural Resource Data Models
- Database maintenance
- Data sharing policy



A scenic sunset over a lake. The sky is filled with soft, colorful clouds in shades of orange, yellow, and blue. The sun is low on the horizon, casting a warm glow across the water. In the background, there are rolling mountains. On the left side of the image, there is a dark, silhouetted shoreline with trees. The water in the foreground is calm, reflecting the colors of the sky.

Thank you!

**Maxine Levin, USDA Natural Resources
Conservation Service, Washington, D.C.
maxine.levin@wdc.usda.gov
202-720-1809**