GEOSS Related Activities at ICIMOD

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International Centre for Integrated Mountain Development (ICIMOD)

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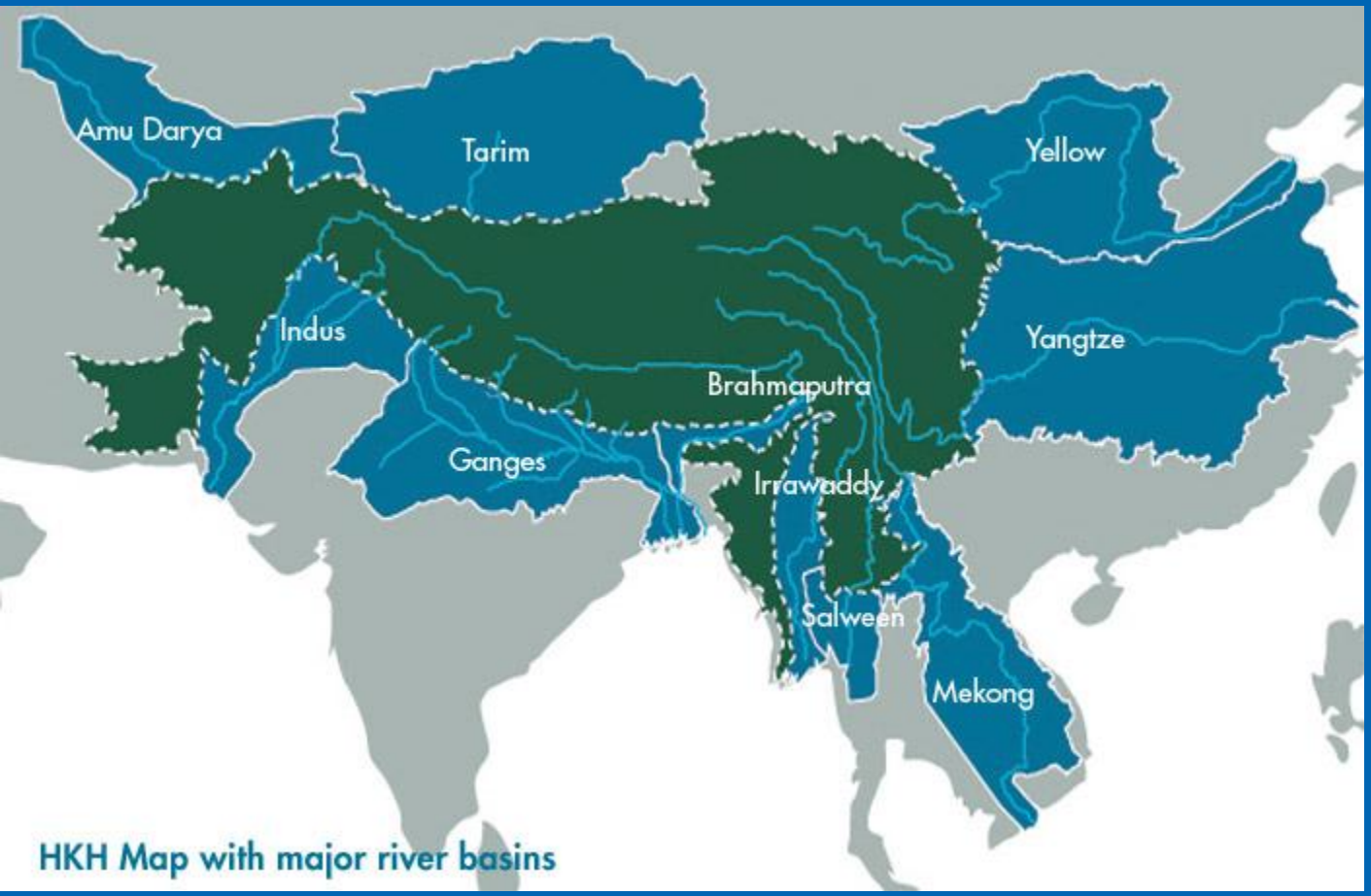

HKH Map with major river basins

- Regional knowledge, learning and enabling centre devoted to sustainable mountain development
- Intergovernmental and independent organisation
- Information and knowledge are chief commodities of the centre

Climate Change in the Himalaya - an Overarching Issue in the Region

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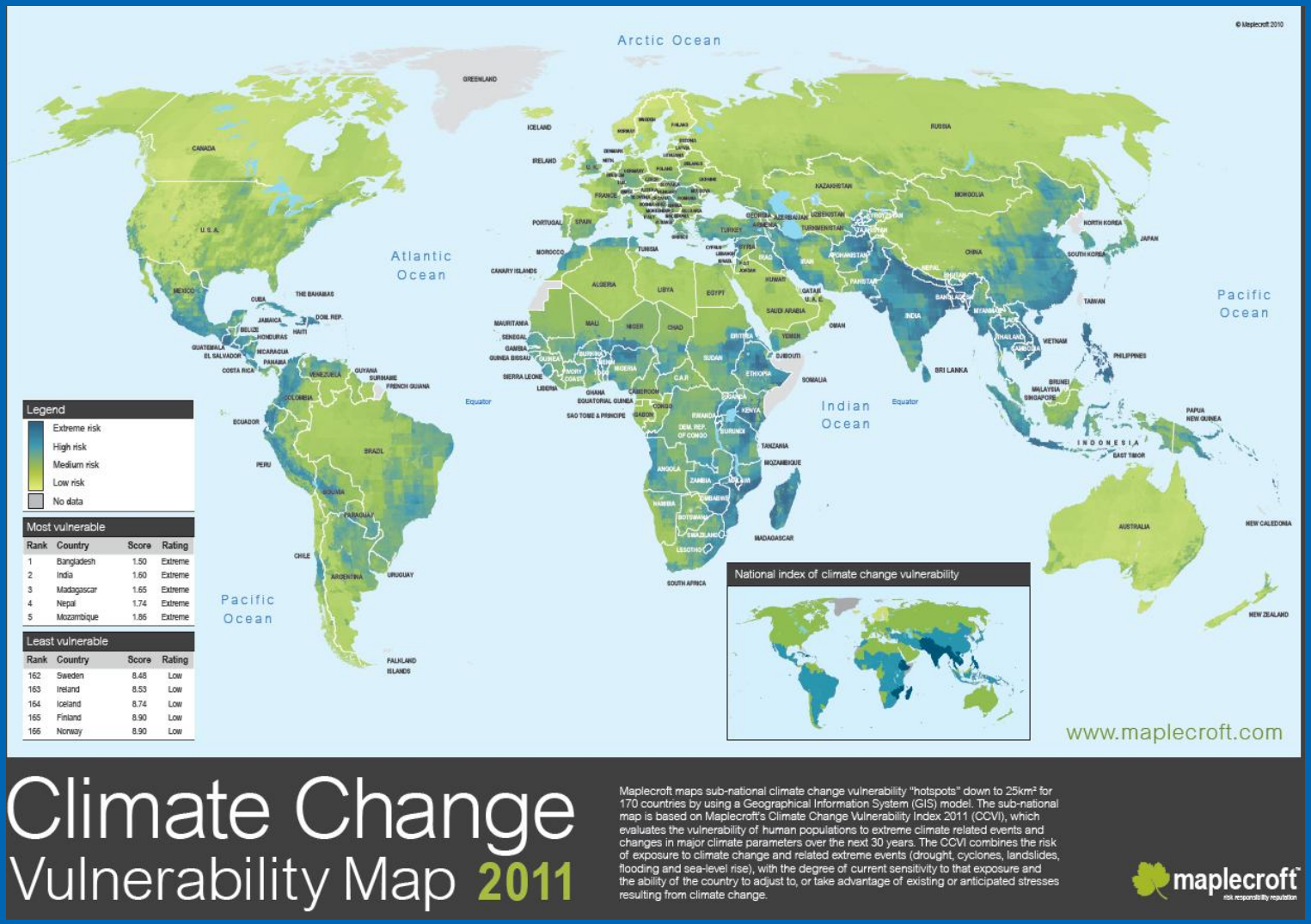

Most Vulnerable

Bangladesh (1)
India (2)
Nepal (4)
Afghanistan (8)
Myanmar (10)
Pakistan (16)

Pressures on Mountain Systems

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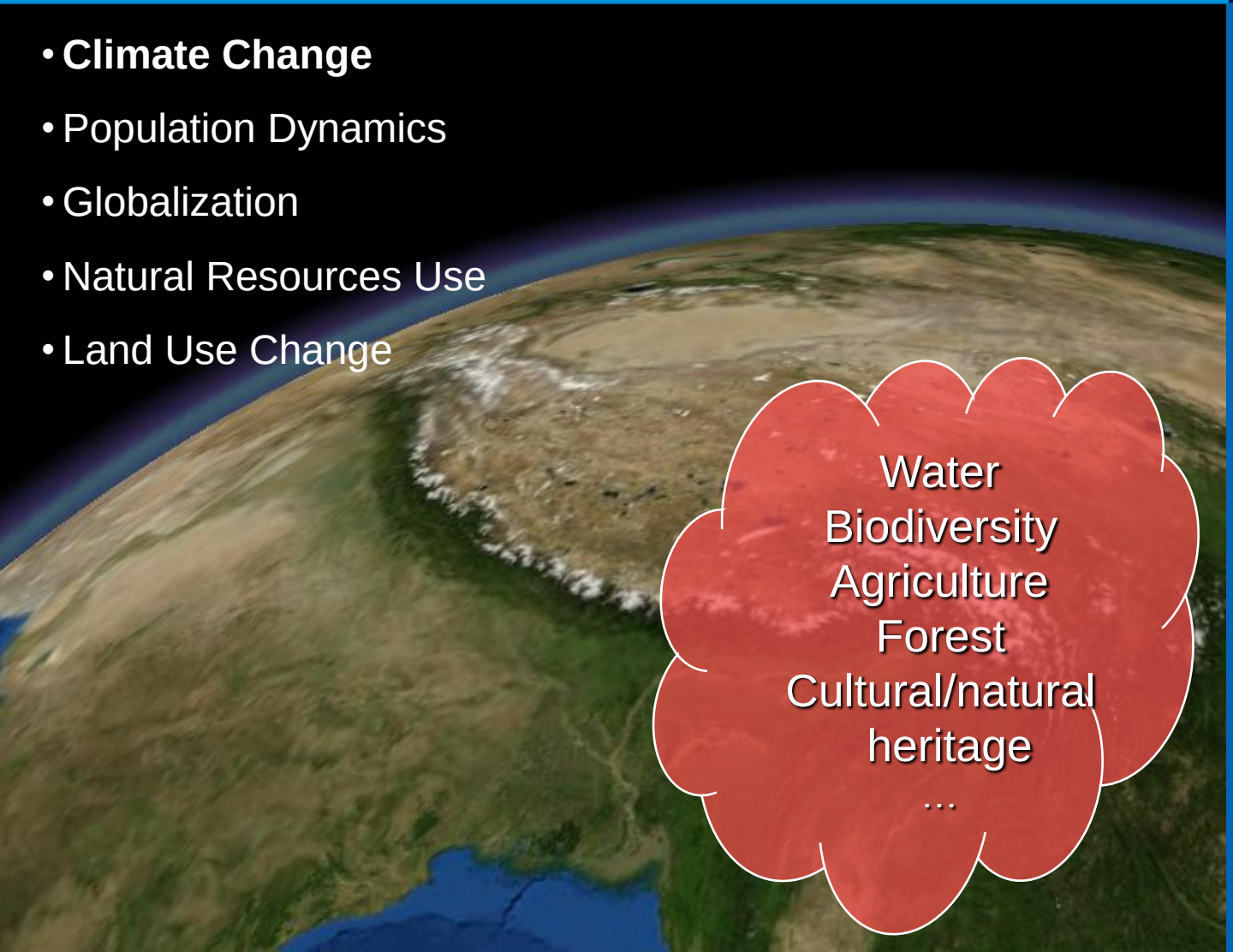
- **Climate Change**
- Population Dynamics
- Globalization
- Natural Resources Use
- Land Use Change



Information needs

- Spatial and temporal data requirements
- Integration of social, economic & environmental components
- Translation of data from scientific domain to policy decision making

Mountain Environment and Natural Resources Information System (MENRIS)

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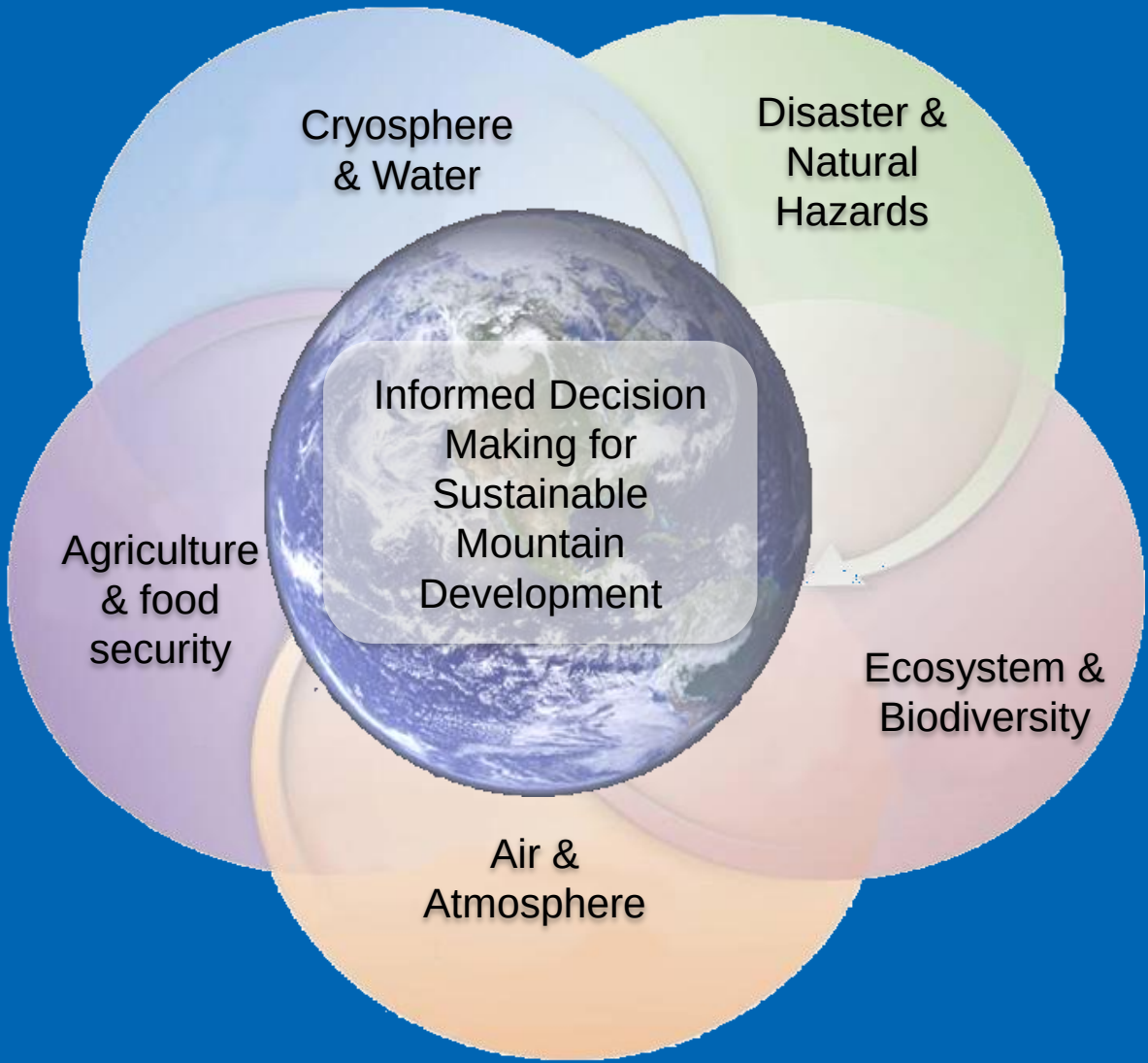
- Build information and knowledge
- Scientific tools and methods, Innovation and technology transfer
- Integrated approaches, Harmonisation and standardisation
- Regional Networking and Platform



MENRIS -
Regional Geospatial Resource Centre

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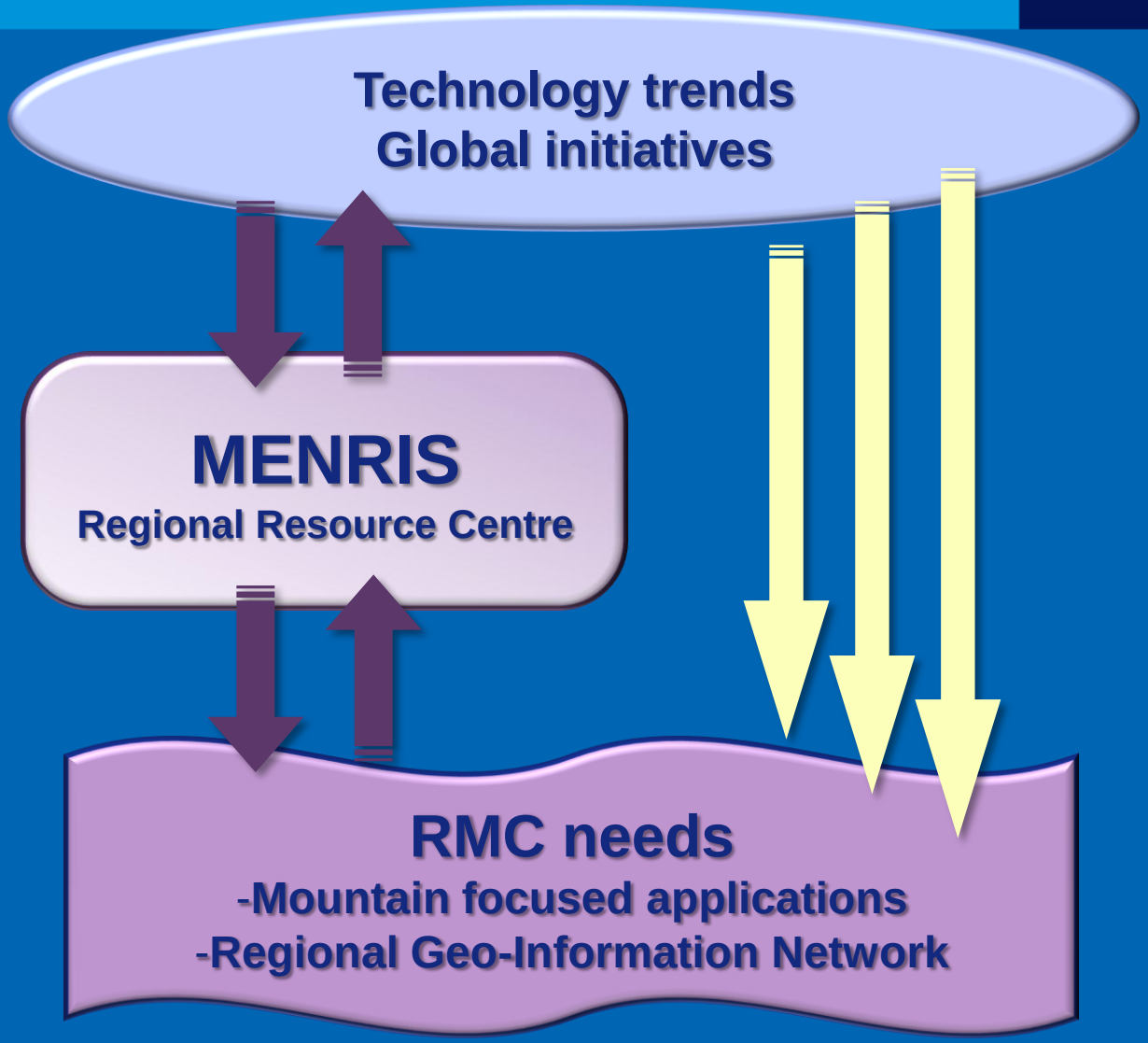


SERVIR
Facility at NASA
SERVIR-Himalaya
SERVIR-Africa
SERVIR-Mesoamerica
SERVIR

SERVIR-HIMALAYA
Regional Visualization and Monitoring System

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Improving environmental decision-making in the Hindu Kush Himalayan region through dissemination and analyses of earth observation information

SERVIR-HIMALAYA

Regional Visualization and Monitoring System

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Demand:
cultivate use of better information

- Users engaged to define needs and opportunities
- Capacity building and training delivered
- Outreach and communications conducted

Supply:
Access to high quality, user-tailored tools and information services

- Improved access through a functioning One-Stop platform
- Data quality and coverage improved
- Tools, models, and applications co-developed

SERVIR-HIMALAYA

Regional Visualization and Monitoring System

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- Formal launching
- Inception workshop
- Needs assessment

Science Applications

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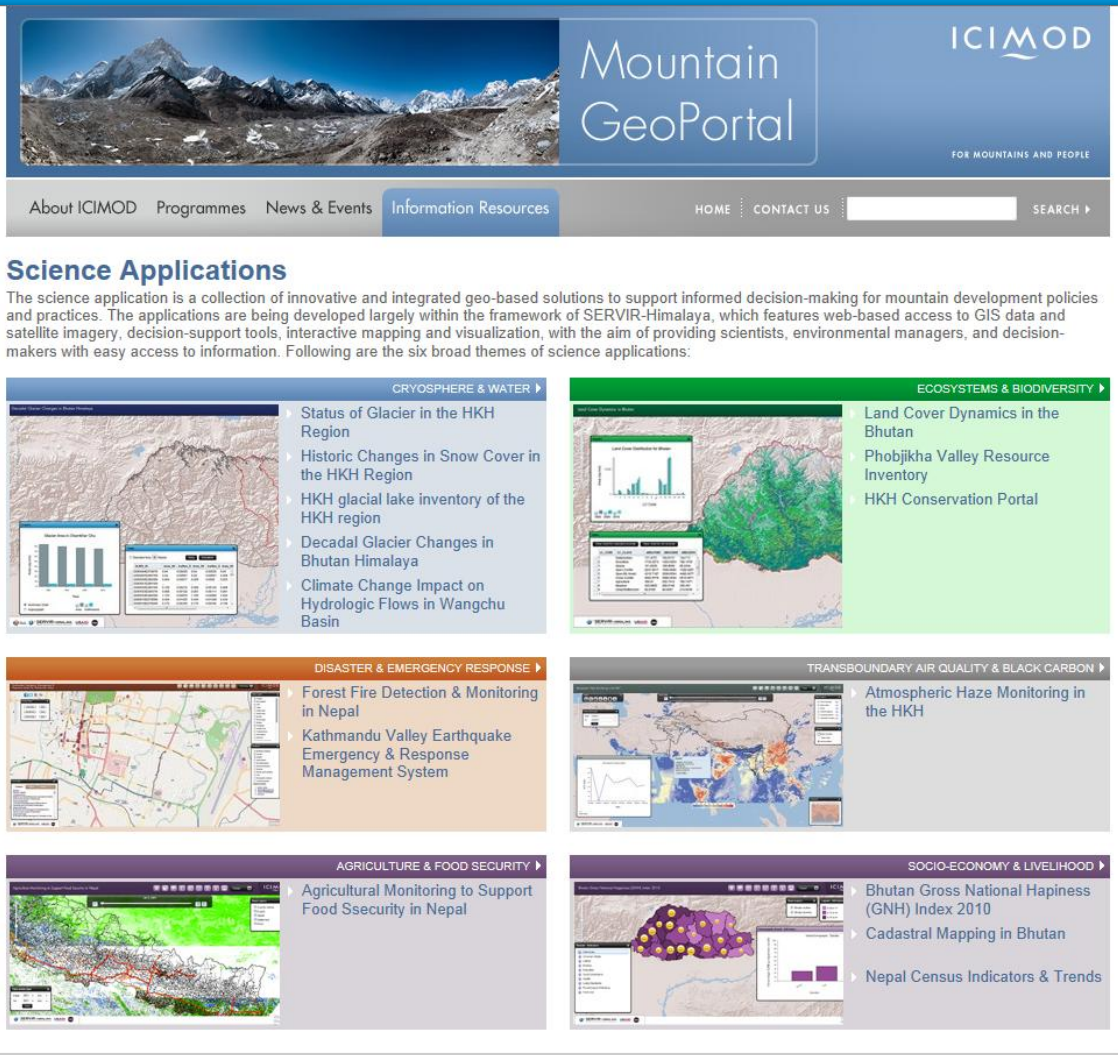

Science Applications: Assessment of Snow

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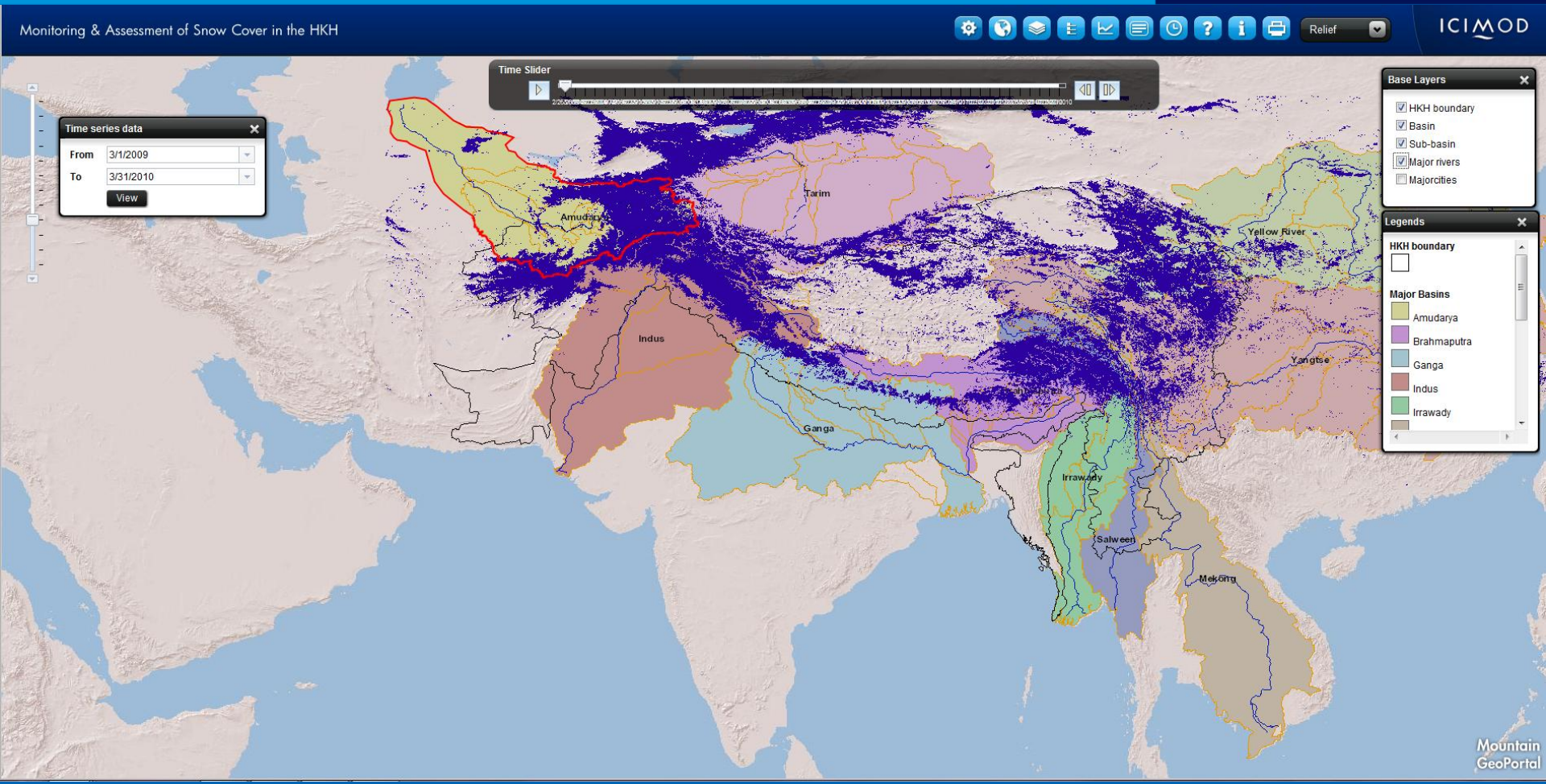

Science Applications: Status of Glaciers

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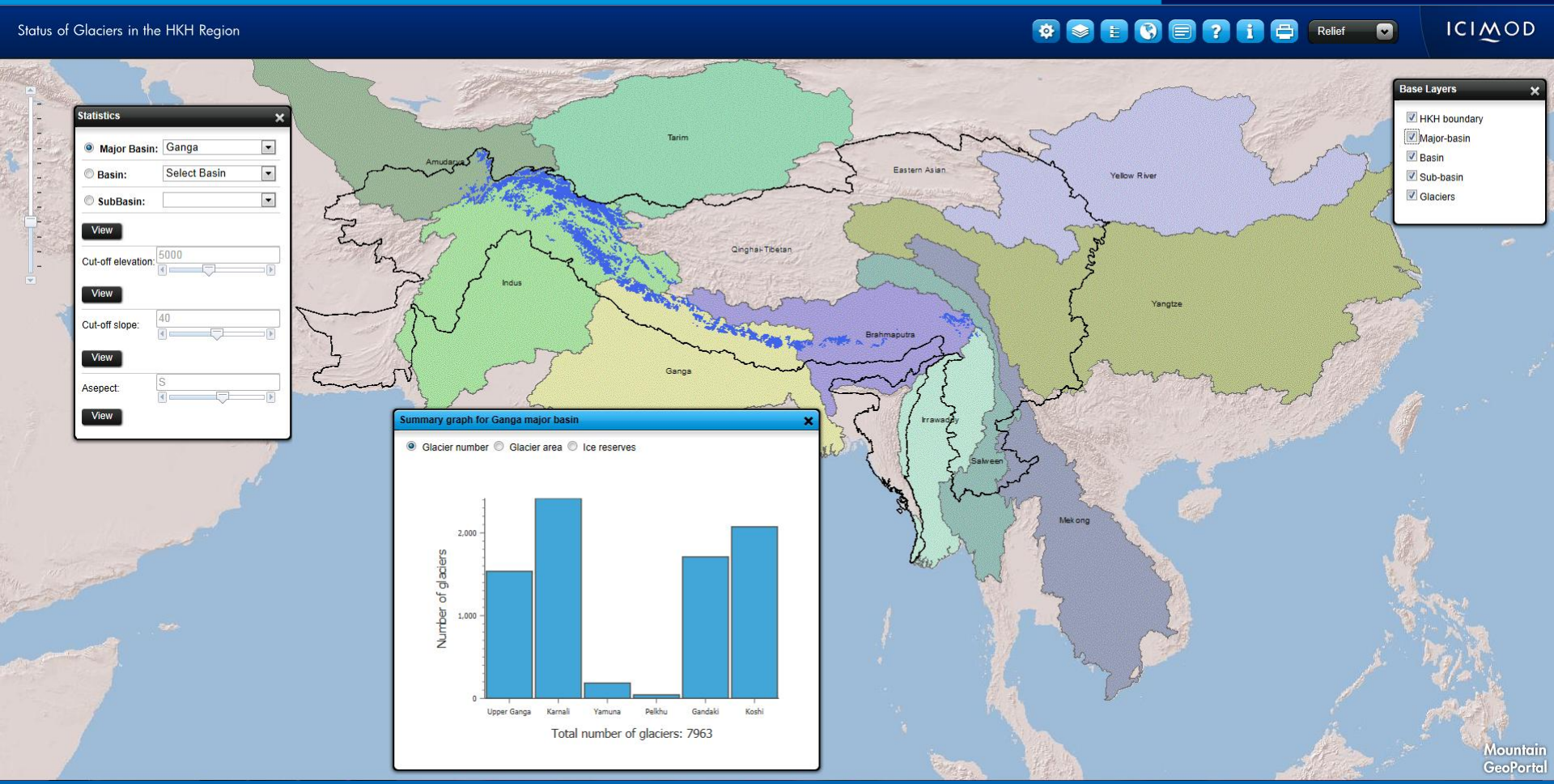

Science Applications:
Decadal Changes in Glaciers

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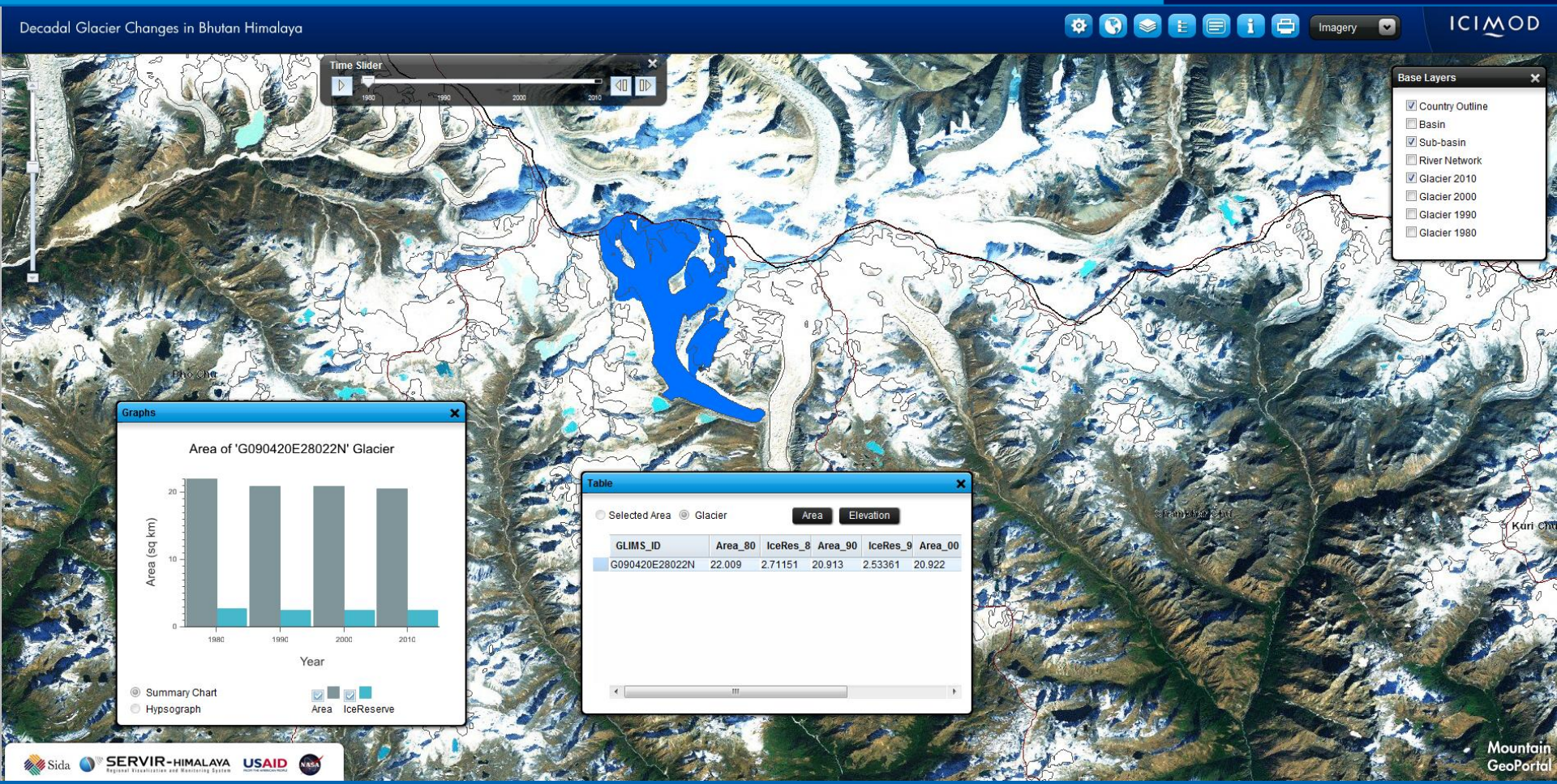

Science Applications:
Land Cover Change Assessment

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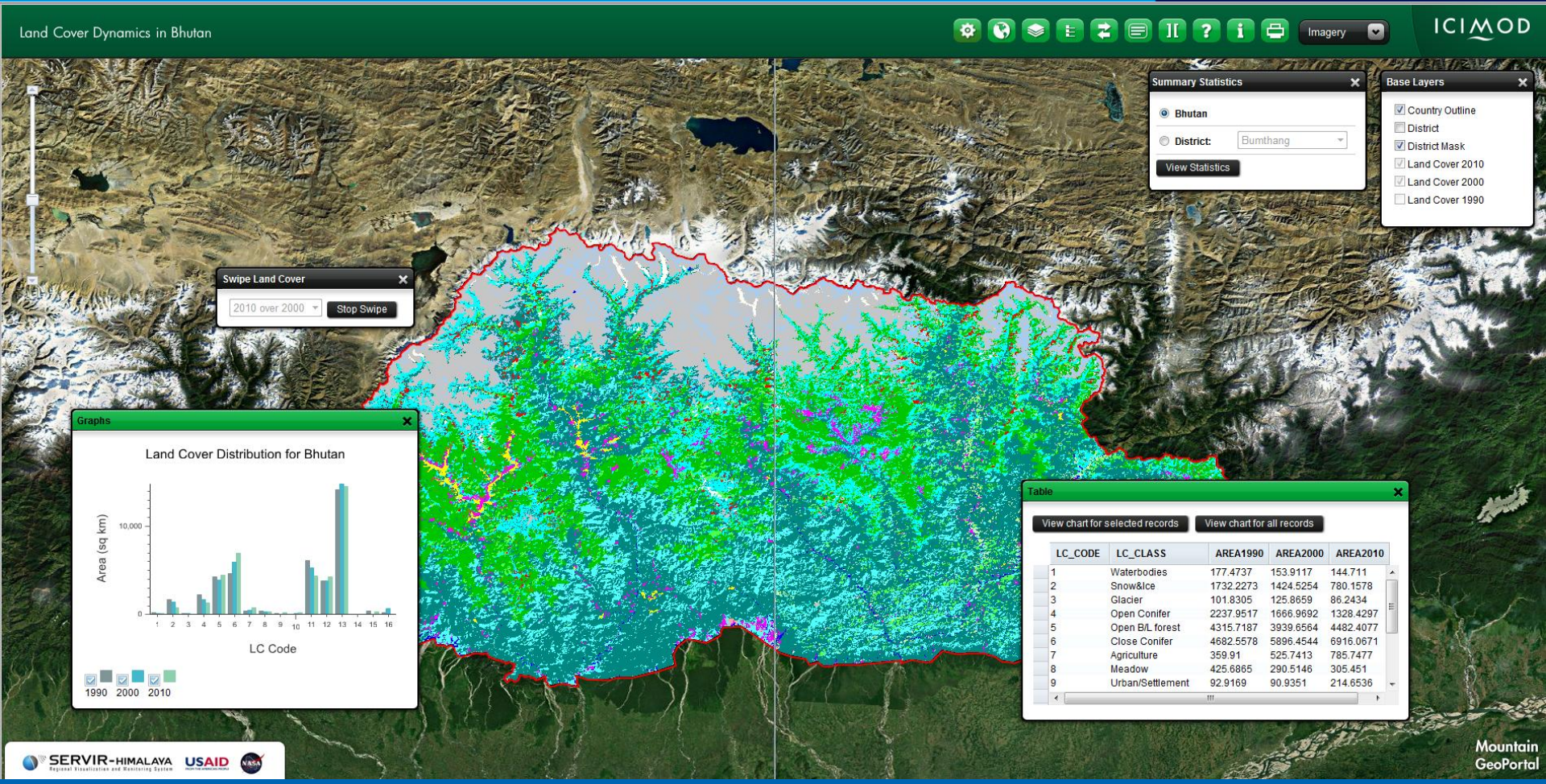

Science Applications:
Emergency Management and Response

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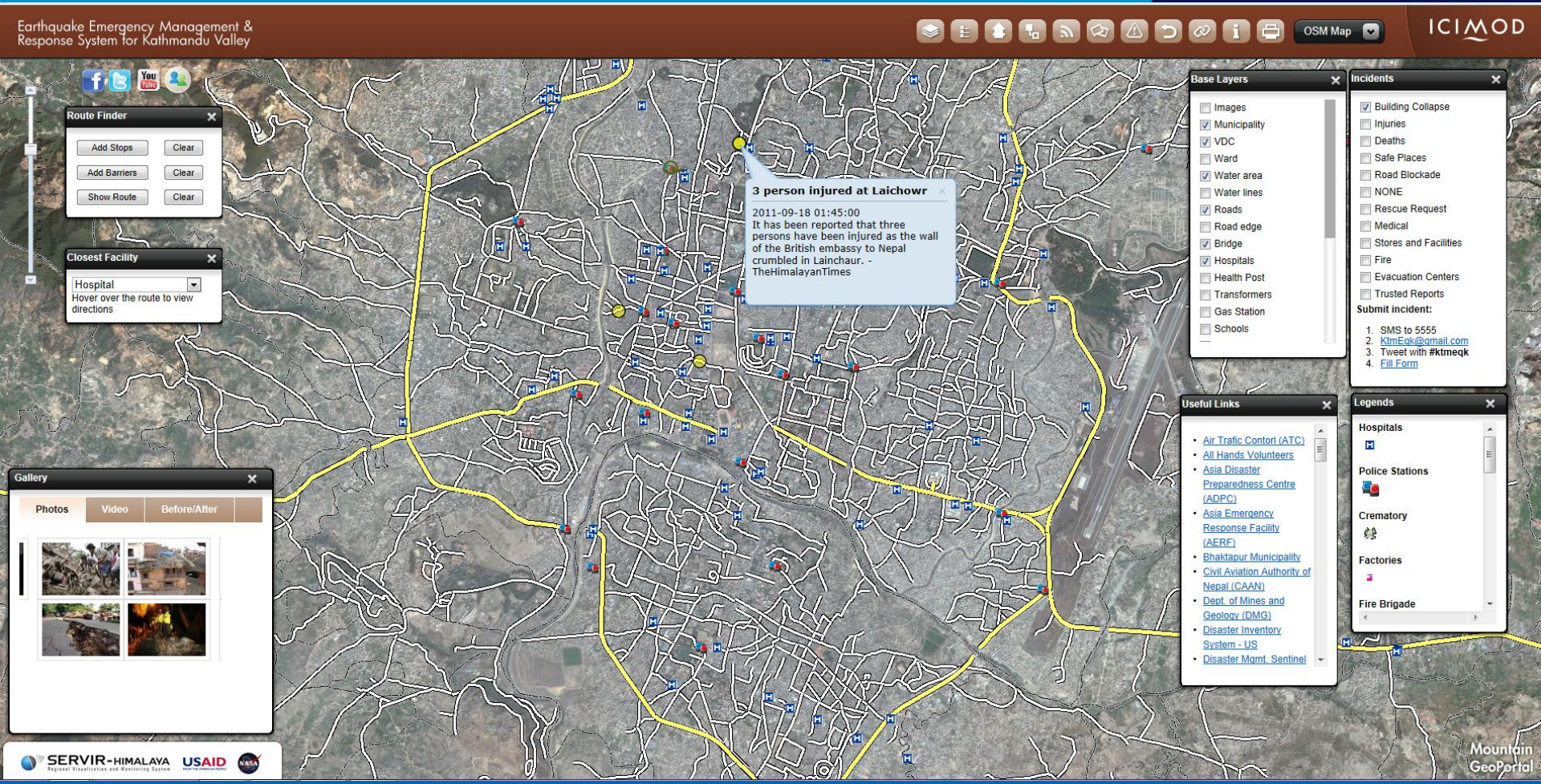

Science Applications:
Forest Fire Detection and Monitoring

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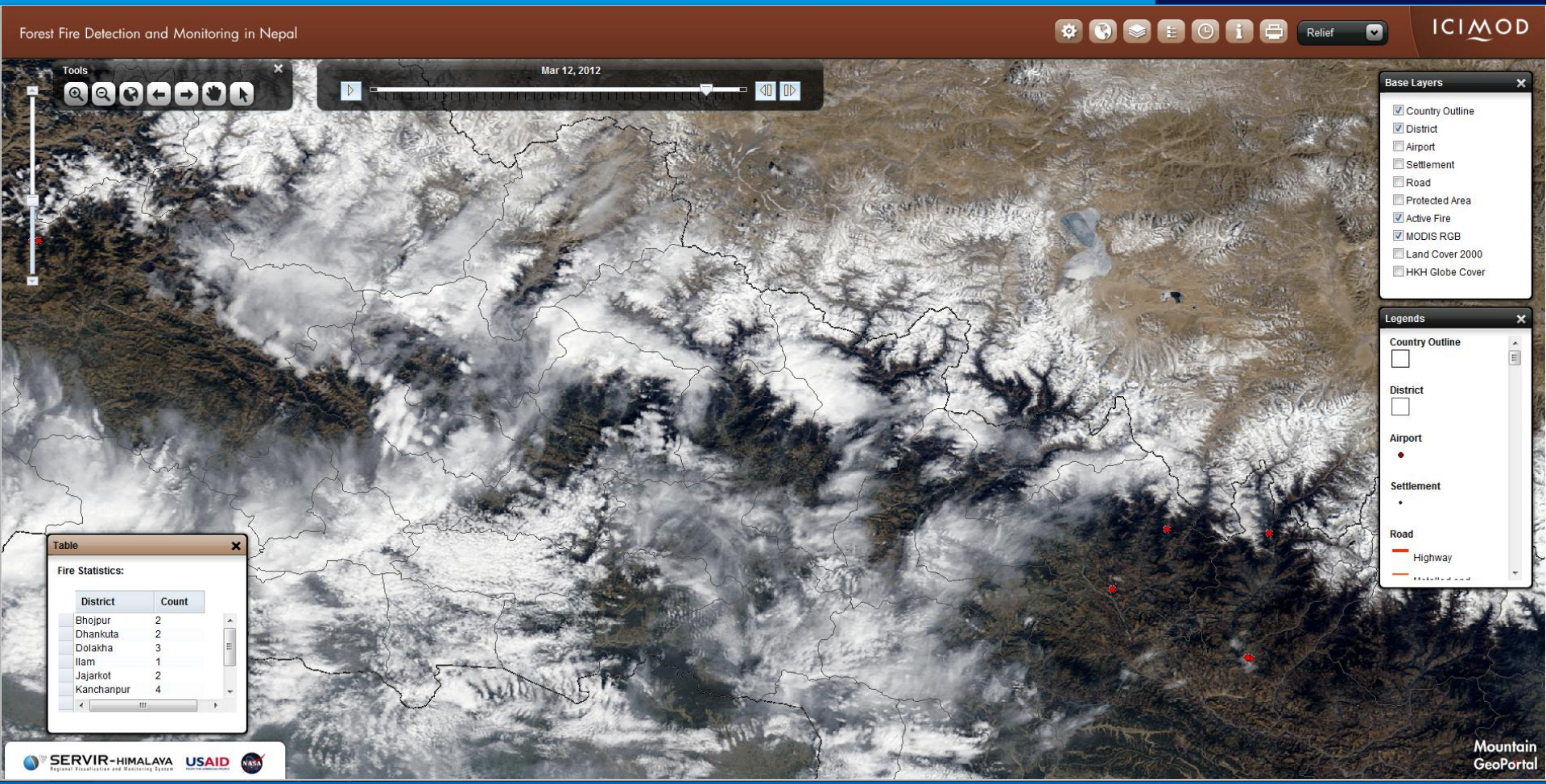

Science Applications: Haze Monitoring

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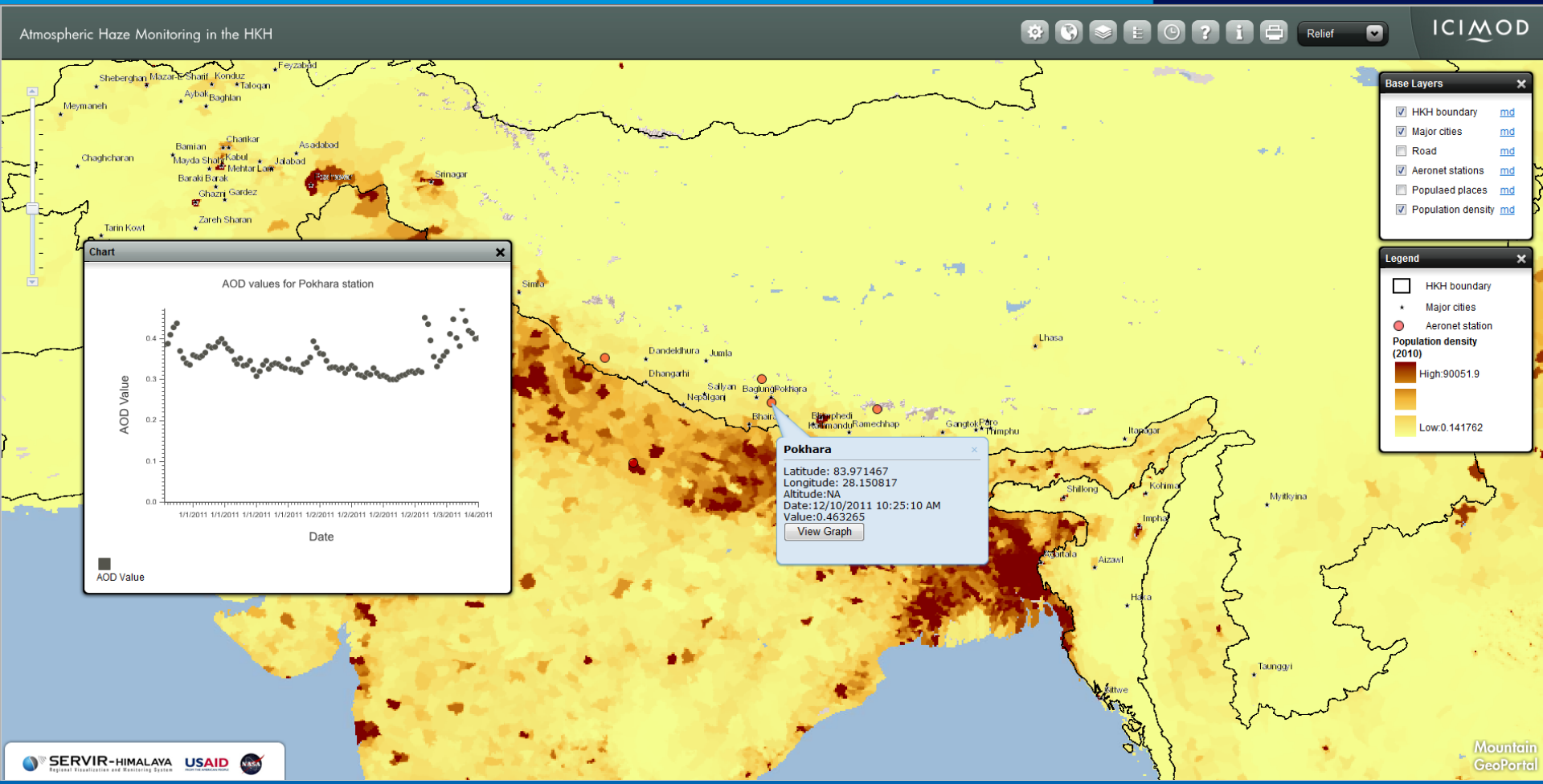

Science Applications: Agriculture Monitoring

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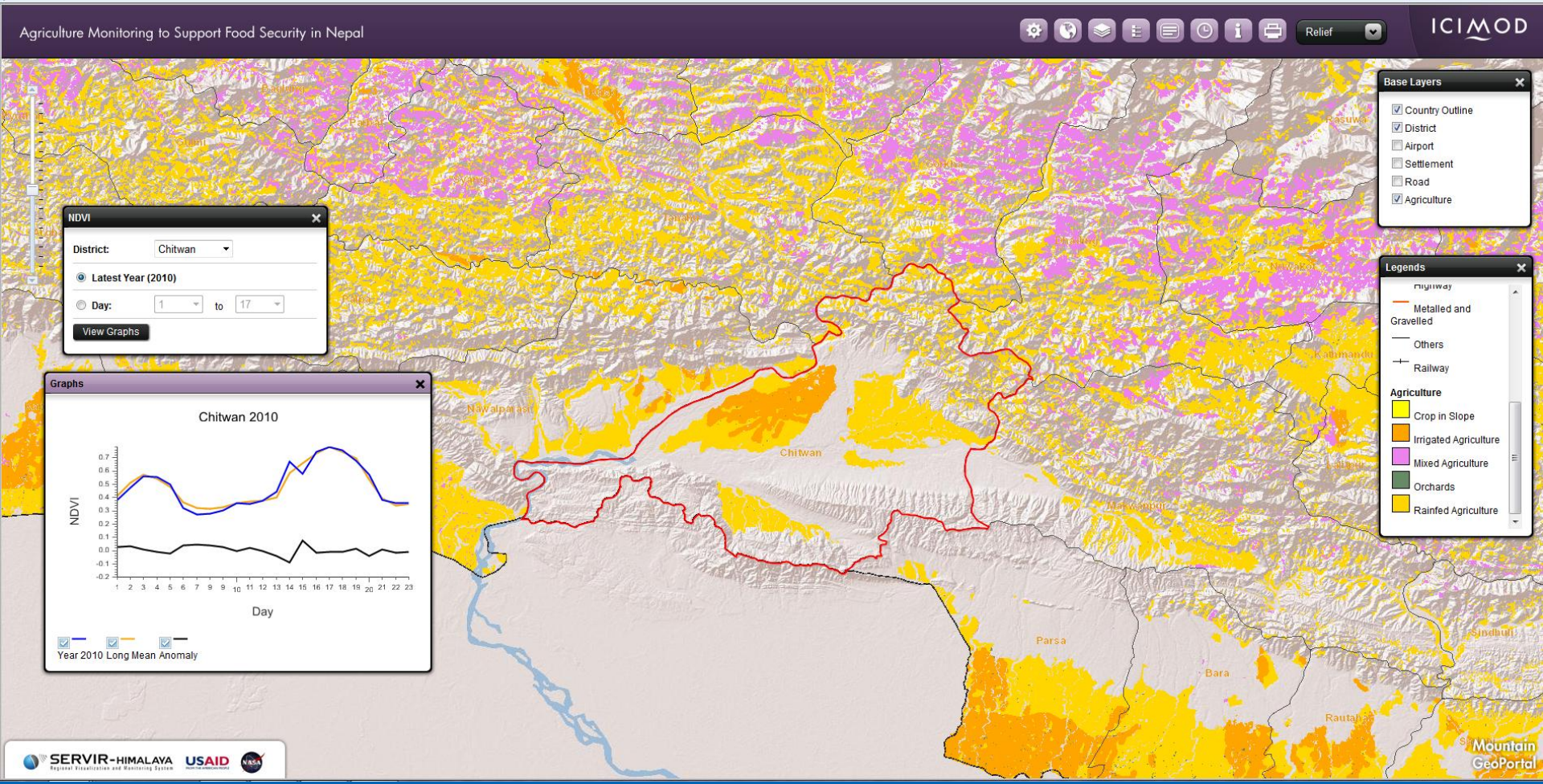

Gross National Happiness

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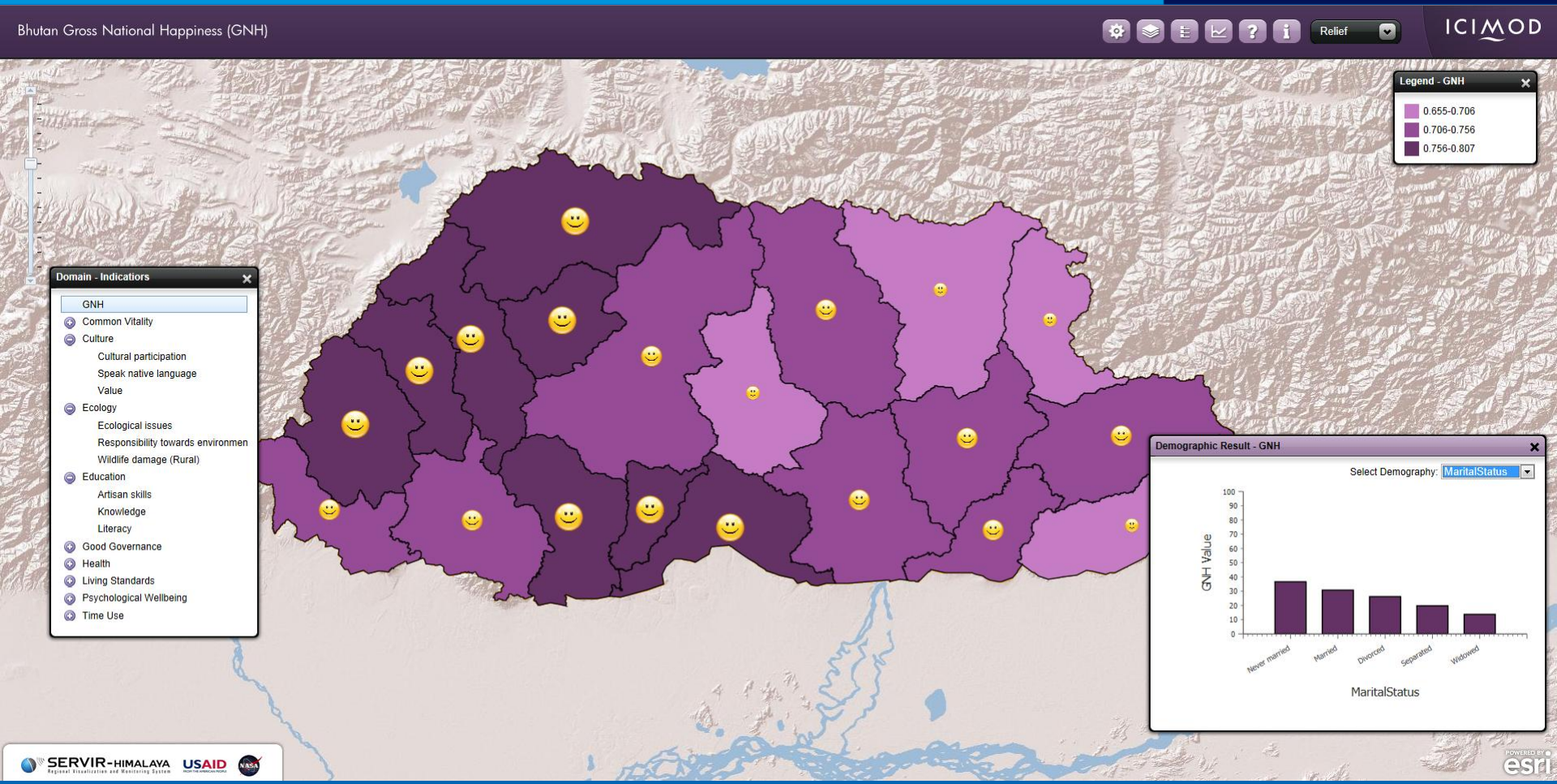

Rapid Response Mapping for Disaster

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- Collaboration with Sentinel Asia, JAXA, UN-Spider and national institutions
- Regional coordination
- Capacity building

REMOTE SENSING

Earth-Observation Summit Endorses Global Data Sharing

BEIJING—Last August, heavy monsoon rains submerged nearly one-fifth of Pakistan, inflicting $43 billion worth of damage. The floodwaters destroyed homes and businesses, washed away bridges and roads, ruined crops, and claimed about 1800 lives. As bad as it was, the toll could have grown in the weeks that followed if not for a novel Earth-observation system featured at a meeting here last week.

In July, before the deluge, the International Centre for Integrated Mountain Development in Kathmandu—along with NASA and the U.S. Agency for International Development—had booted up SERVIR-Himalaya, a Web-based monitoring system that pulls together satellite imagery, forecast models, and ground observations. It "showed the progression of the floods in [near] real time," says Sherburne Abbott, associate director for environment at the White House Office of Science and Technology Policy. As the disaster unfolded, analyses revealed that flooding had knocked nearly 200 tuberculosis clinics out of commission. Forewarned, aid agencies scrambled to steer patients to functioning health centers. "They knew they were going to have a real problem," Abbott says.

SERVIR is one new instrument in a veritable orchestra of Earth-observation systems intended to make reams of data available and relevant to decision-makers. At the summit last week of the Group on Earth Observations (GEO)—the organization attempting to get this ensemble performing in synchrony—initiatives were unveiled to monitor land-cover changes and forest carbon stocks. And GEO delegates embraced plans to funnel data from platforms tracking everything from biodiversity to earthquake risks into a free and open database. "What's happening is groundbreaking," says David Hayes, deputy secretary of the U.S. Department of the Interior. "This data is incredibly valuable. If you share it, your incremental contribution can yield a super benefit."

Established in 2005, GEO is an effort by 85 countries, the European Commission, and 58 international organizations to meld disparate remote-sensing tools and ground-based databases—300 databases and counting—into a seamless Global Earth Observation System of Systems (GEOSS), which is expected to come fully online in 2015. When GEO was conceived, "we understood that if you want to manage planetary problems, you have to have planetary information—which didn't exist at that stage," says Bob Scholes, a biodiversity expert at the Council for Scientific and Industrial Research in Pretoria.

GEO's progress has been remarkably swift, Scholes adds, and the project has overcome the view that data should be hoarded, not shared. "When an earlier generation of scientists collected data on the public purse, they considered it their data. The norm now is that data will quickly enter the public domain," he says. To reinforce such good behavior, "persistent identifier" tags are being developed that will note which scientists or teams contributed data to GEOSS. The U.S. Office of Management and Budget (OMB) is spurring agencies to release data via www.data.gov. "OMB is looking to measure our department's productivity in part by how much we're adding to the public's access to data," says Hayes.

NASA and the U.S. Geological Survey 2 years ago began allowing free access to their 4-decade Landsat archive, including images with a resolution of 30 meters that enable tracking of land-cover changes wrought by human activity. And riding new open-data legislation in the European Union, the European Space Agency plans to allow free access to data streams from its soon-to-be-launched Sentinel satellites, says Manuela Soares, director for environmental research at the European Commission's Research Directorate. "There's been delivery of data on a massive scale," says Gary Richards of Australia's Department of Climate Change and Energy Efficiency in Canberra.

Ground-truthing such data is a key element of SilvaCarbon, a U.S.-led scientific network announced here to help GEO improve access to Earth-observation data on forests. SilvaCarbon is expected to develop technologies to implement one of the few bright spots in international climate negotiations: REDD+, a program to reduce emissions from deforestation and enhance forest carbon stocks. Together with GEO's Global Forest Observation Initiative, SilvaCarbon "shows that we are ready to take the next big step to a robust and transparent global monitoring system for forest carbon," says Richards.

A second new effort, the Global Land-Cover Data Initiative, aims over the next 2 years to compile and publicly share a current snapshot of Earth's land-cover conditions. Landsat data provide 80% coverage; GEO partners will fork over the rest.

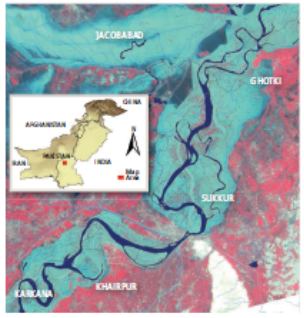
As GEOSS is woven from disparate data sets, there have been a few glitches in integrating the information. "We can't get all data into the free and open database at this point," says Abbott. And some resistance remains. "We still get pushback," says Scholes. "Some countries worry about how data release will affect national security." Nations fret, for instance, over satellite data they have no control over and others revealing info such as flows rates of transboundary rivers. Of course, all agree that some sensitive data, such as the precise location of the last few individuals of an endangered species, should not enter the public domain. "But these instances are now perceived as the exceptions to the rule," Scholes says. And that, he says, testifies to the profound cultural change on data sharing that GEO is helping drive. –RICHARD STONE

GEOSS'S TOP TARGETS

1. Precipitation
2. Soil moisture
3. Surface air temperature
4. Surface wind speed
5. Land cover
6. Surface humidity
7. Vegetation cover
8. Surface wind direction
9. NDVI*
10. Sea surface temperature

*Normalized difference vegetation index

Data fundamentals. Of 146 critical Earth observations, GEO rates these 10 as the highest priority.



Waterlogged. This SERVIR-Himalaya analysis shows flooding along the Indus River in Pakistan's Sindh Province last August.

CREDITS (TOP TO BOTTOM): ISCGM/GEO, ICIMOD, NASA

Outreach & dissemination

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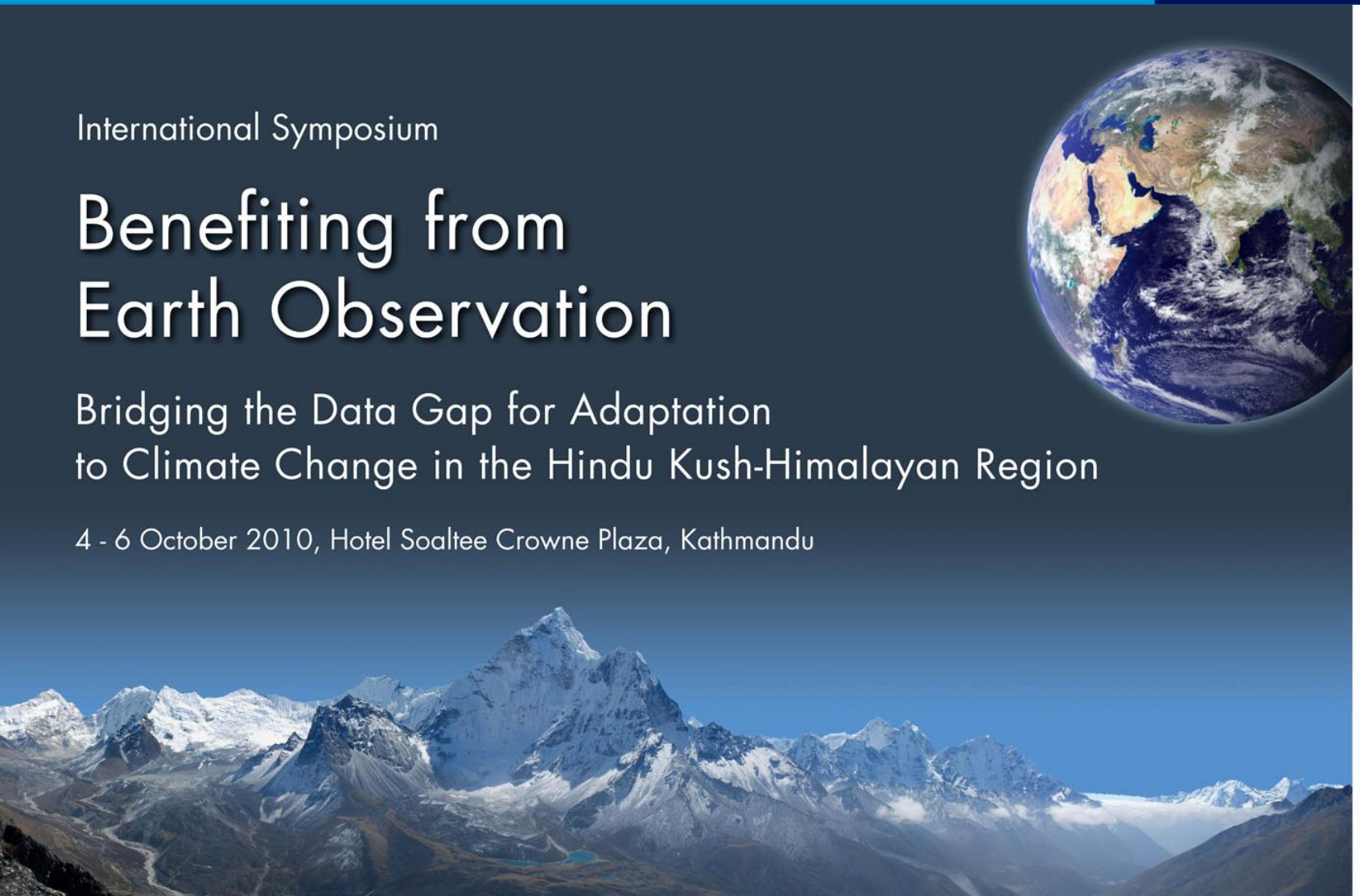

Outreach & dissemination

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Climate Summit for a LIVING HIMALAYAS Bhutan 2011

Food Water Energy Biodiversity

Bangladesh Bhutan India Nepal

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International Symposium

Connecting from Space to Village

Enabling Climate Policy and Actions in the Himalayas

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- International symposium
- Showcasing science applications

International Symposium

Connecting from Space to Village

Enabling Climate Policy and Actions in the Himalayas

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- Regional youth forum
  – 40 youth from Bangladesh, Bhutan, India and Nepal
- Special event for school children

Way Forward

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- Collaboration with international initiatives in development of methods and tools
- Building synergy with ongoing initiatives at national levels
- Dissemination of methods and tools to the national governments and relevant stakeholders through capacity building programs
- Developing SERVIR platform as a mechanism to share data and applications to support decision making

Thank You!