

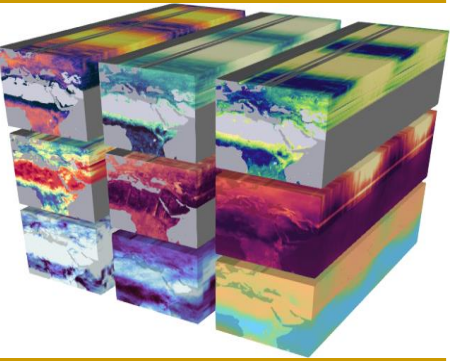
Climate Resilience, Adaptation and Mitigation ensuring Sustainable Development in Western Himalayas



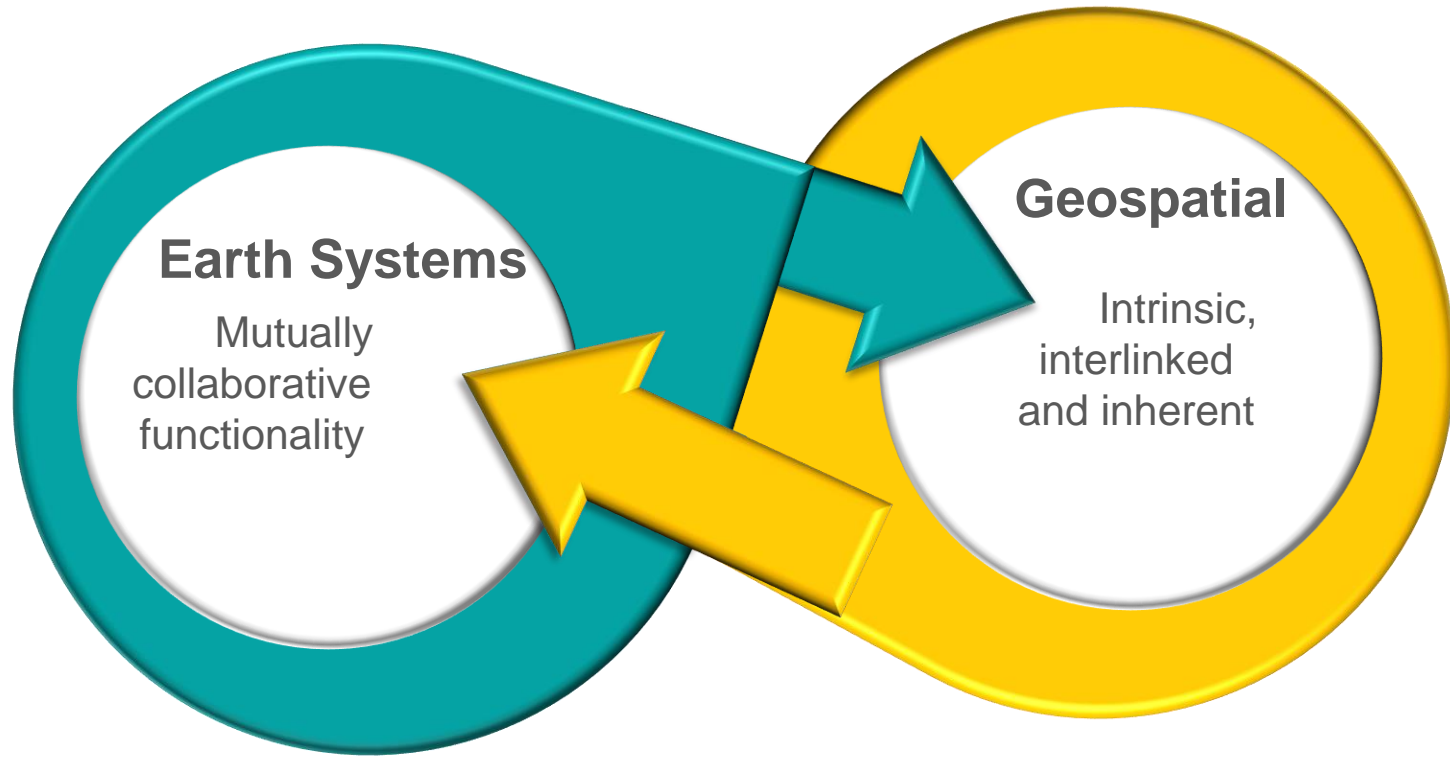
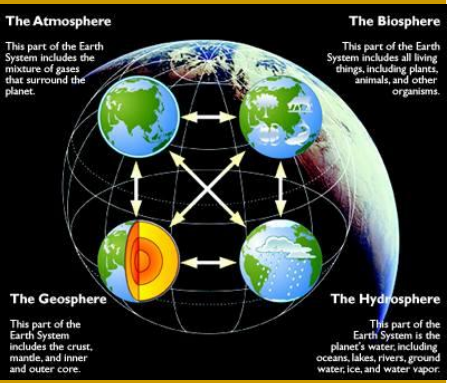
Geospatial Tech: Fostering Resilience in Climate Uncertain Future



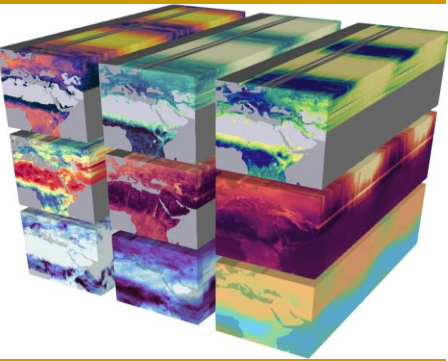
Dr Yogita Shukla
 Founder, AddGEO Foundation
 E-mail: yogita@addgeo.org
 M: +91-9313345486



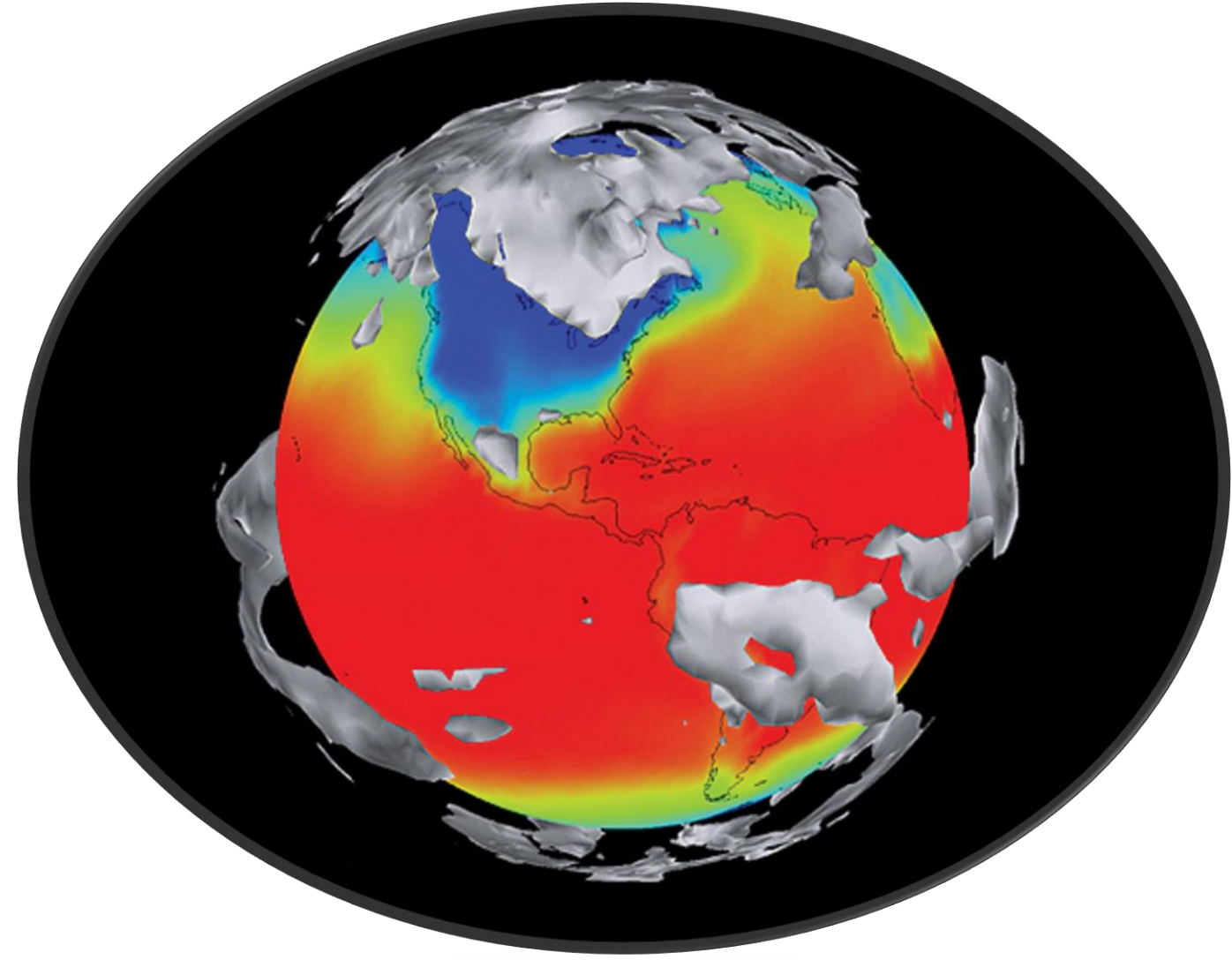
EARTH SYSTEMS DYNAMICS



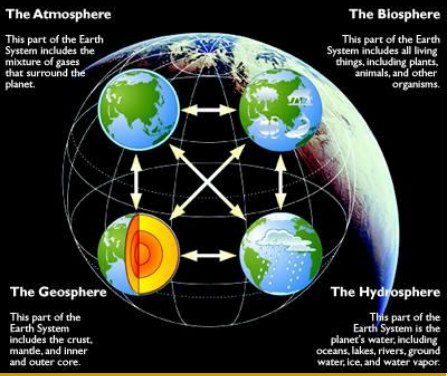
unraveling Intuitive Intelligence



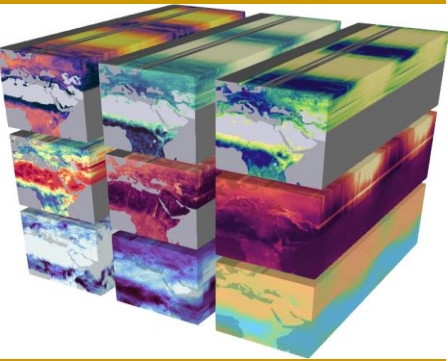
EARTH SYSTEMS DYNAMICS



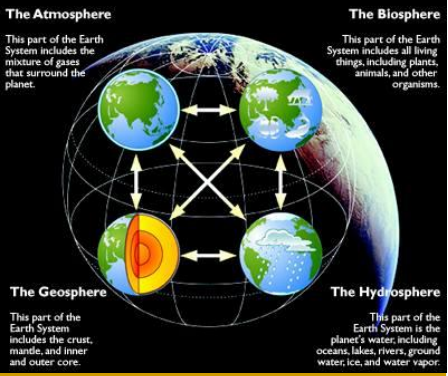
GEO-INTELLIGENCE BRINGS THE EARTH'S INHERENT INTELLIGENCE TO THE FORE



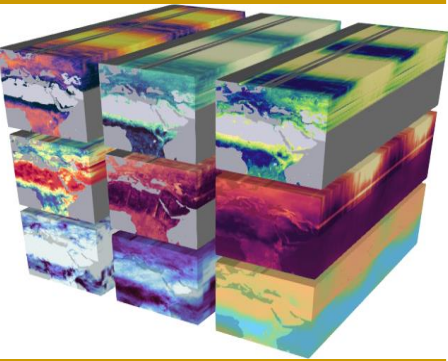
unraveling Intuitive Intelligence



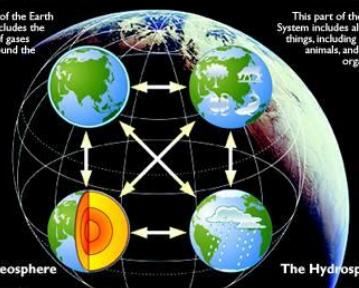
EARTH SYSTEMS DYNAMICS



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BUILDING CLIMATE RESILIENCE



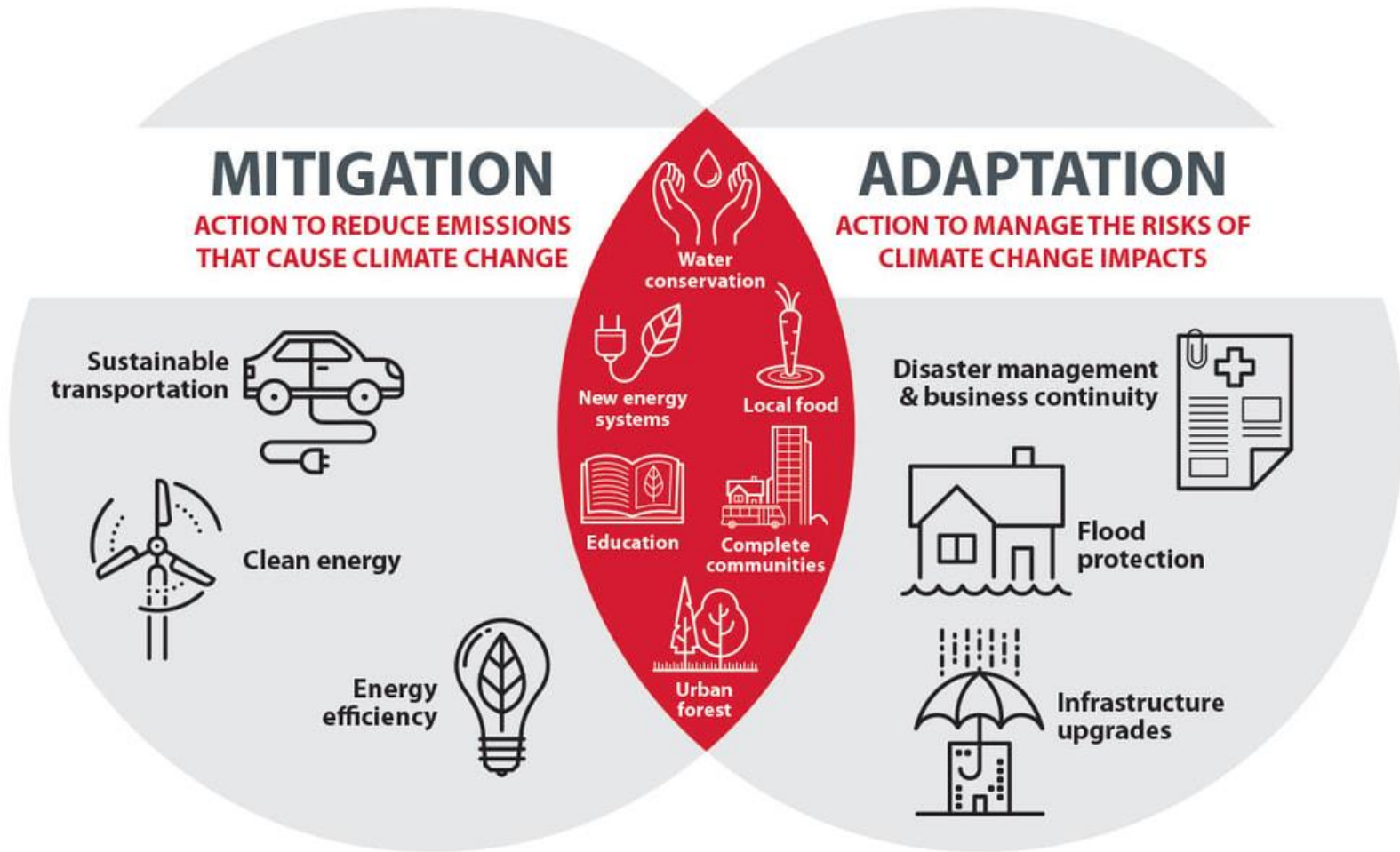
The Atmosphere
This part of the Earth System includes the mixture of gases that surround the planet.

The Biosphere
This part of the Earth System includes all living things, including plants, animals, and other organisms.

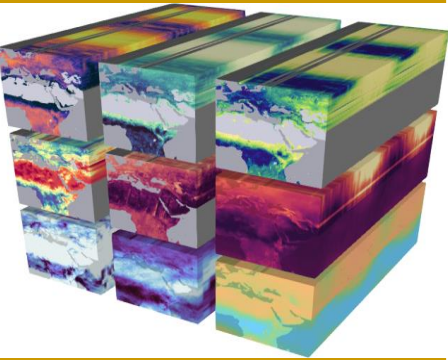
The Geosphere
This part of the Earth System includes the crust, mantle, and inner and outer core.

The Hydrosphere
This part of the Earth System is the planet's water, including oceans, lakes, rivers, ground water, ice, and water vapor.

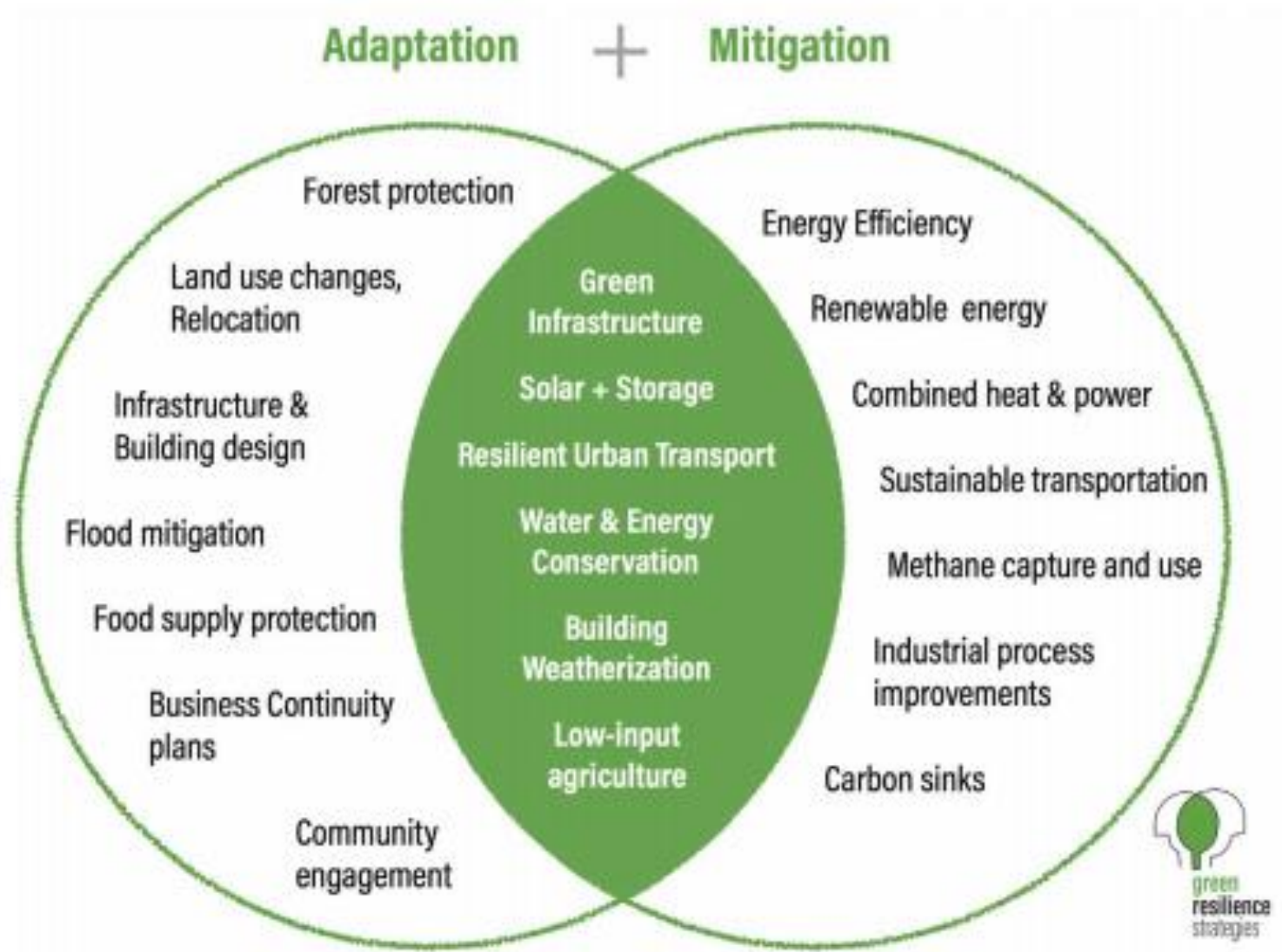
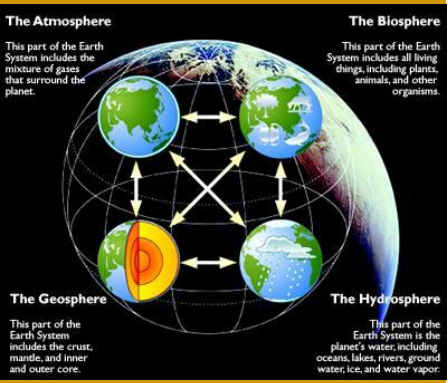
Building Climate Resilience



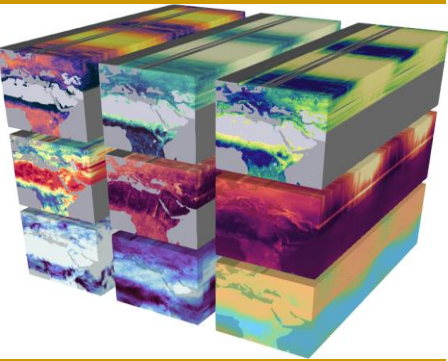
Unraveling Intuitive Intelligence



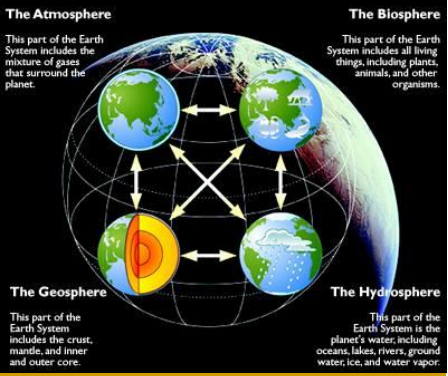
BUILDING CLIMATE RESILIENCE



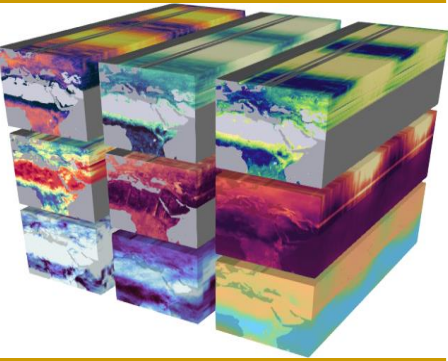
unraveling Intuitive Intelligence



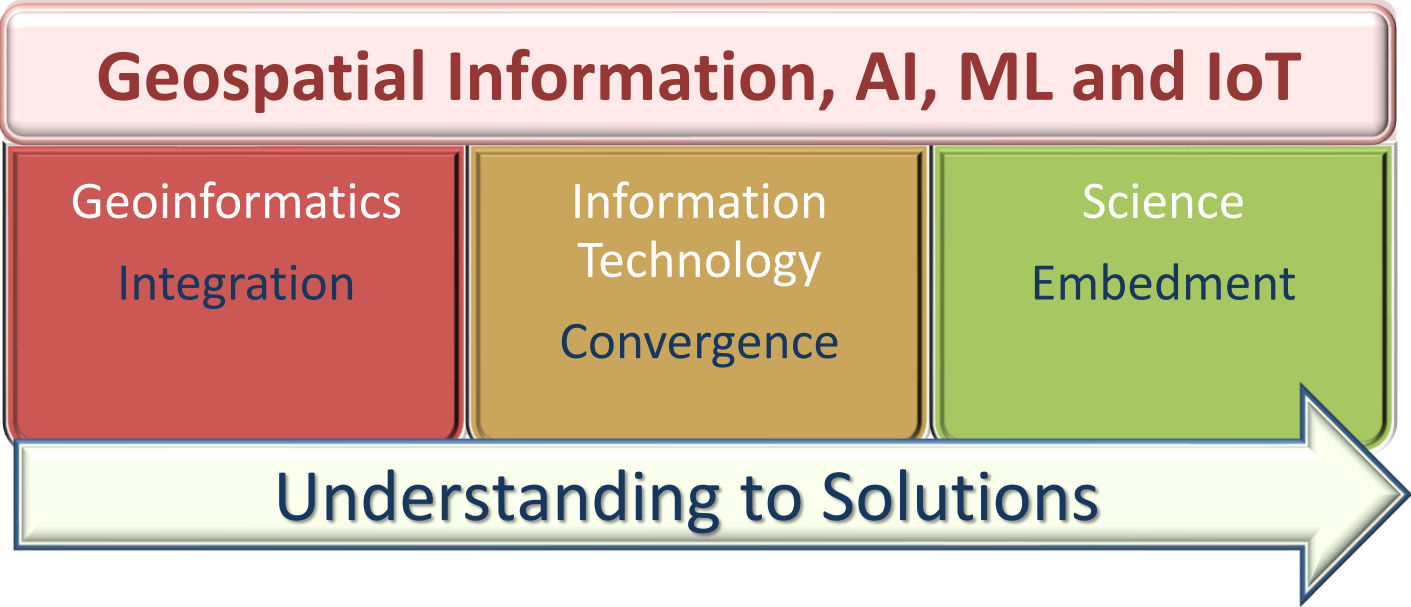
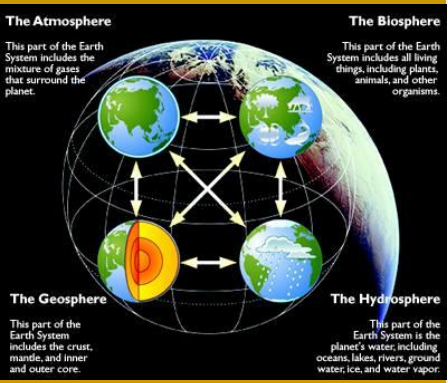
BUILDING CLIMATE RESILIENCE



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BUILDING CLIMATE RESILIENCE

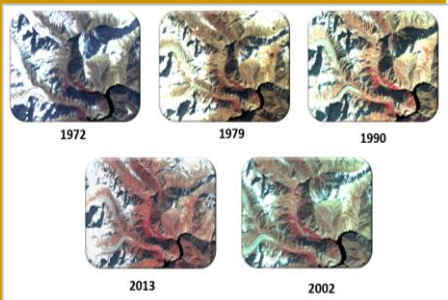
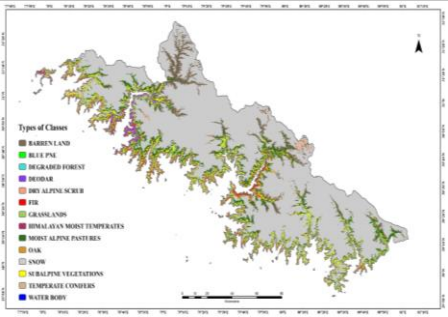


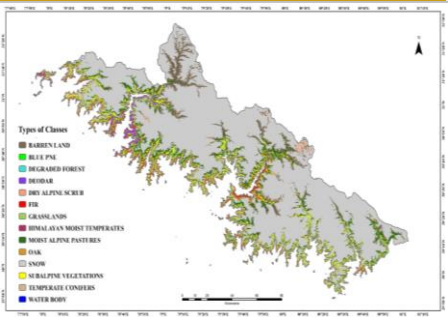
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GeoAI Knowledge and Information Infrastructure For Climate Resilience, Adaptation and Mitigation fostering Sustainable Development in Western Himalayas

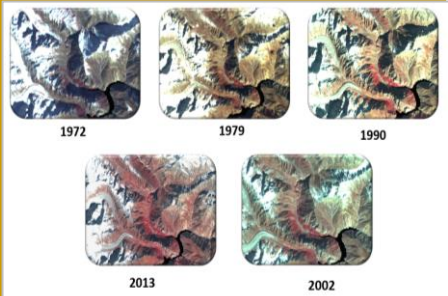
- Creating Data and Information Infrastructure for geospatial data chain from analysis ready earth observation to decision ready information for Western Himalayan region.
- Enabling Findability, Accessibility, Interoperability and Reusability (FAIR) principles in development of vulnerability indices for Smart Decision-Making Solutions.

HIGH ALTITUDE DYNAMICS



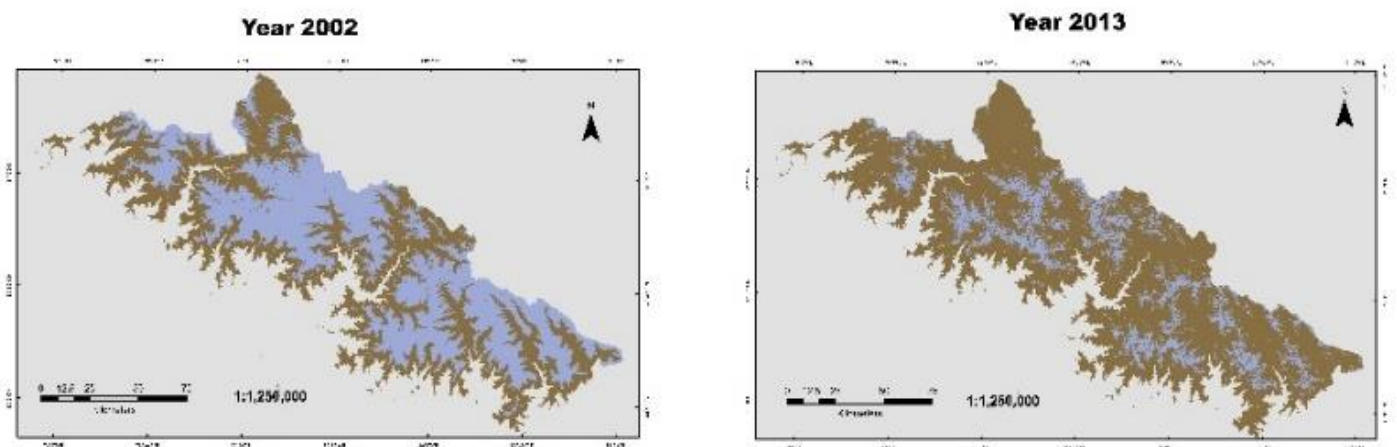
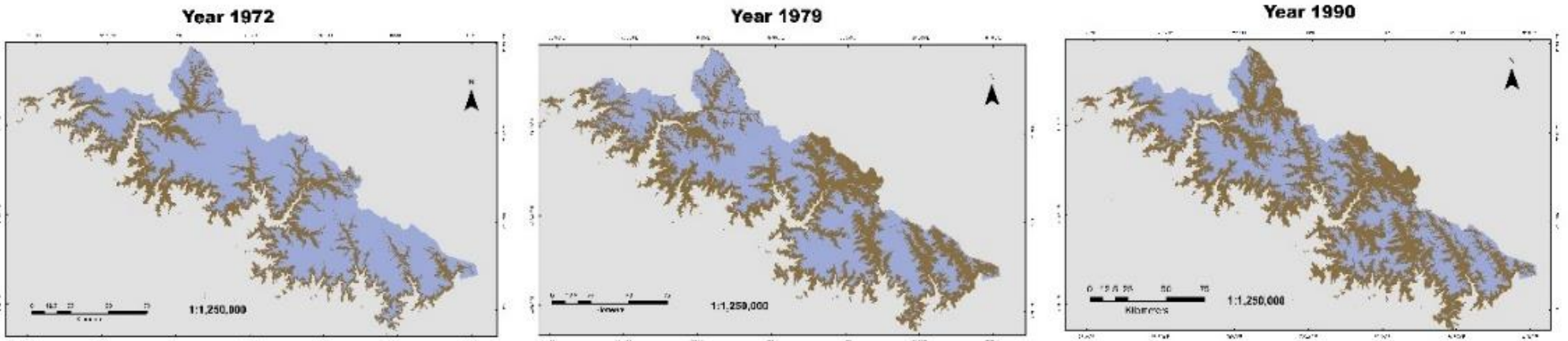


HIGH ALTITUDE DYNAMICS

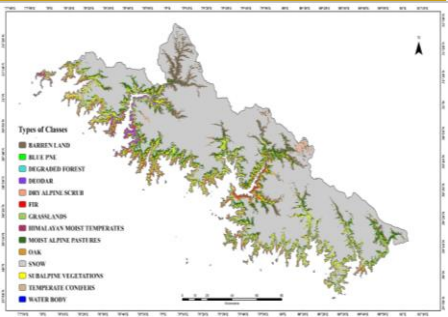


SNOW COVER (Decadal Changes)

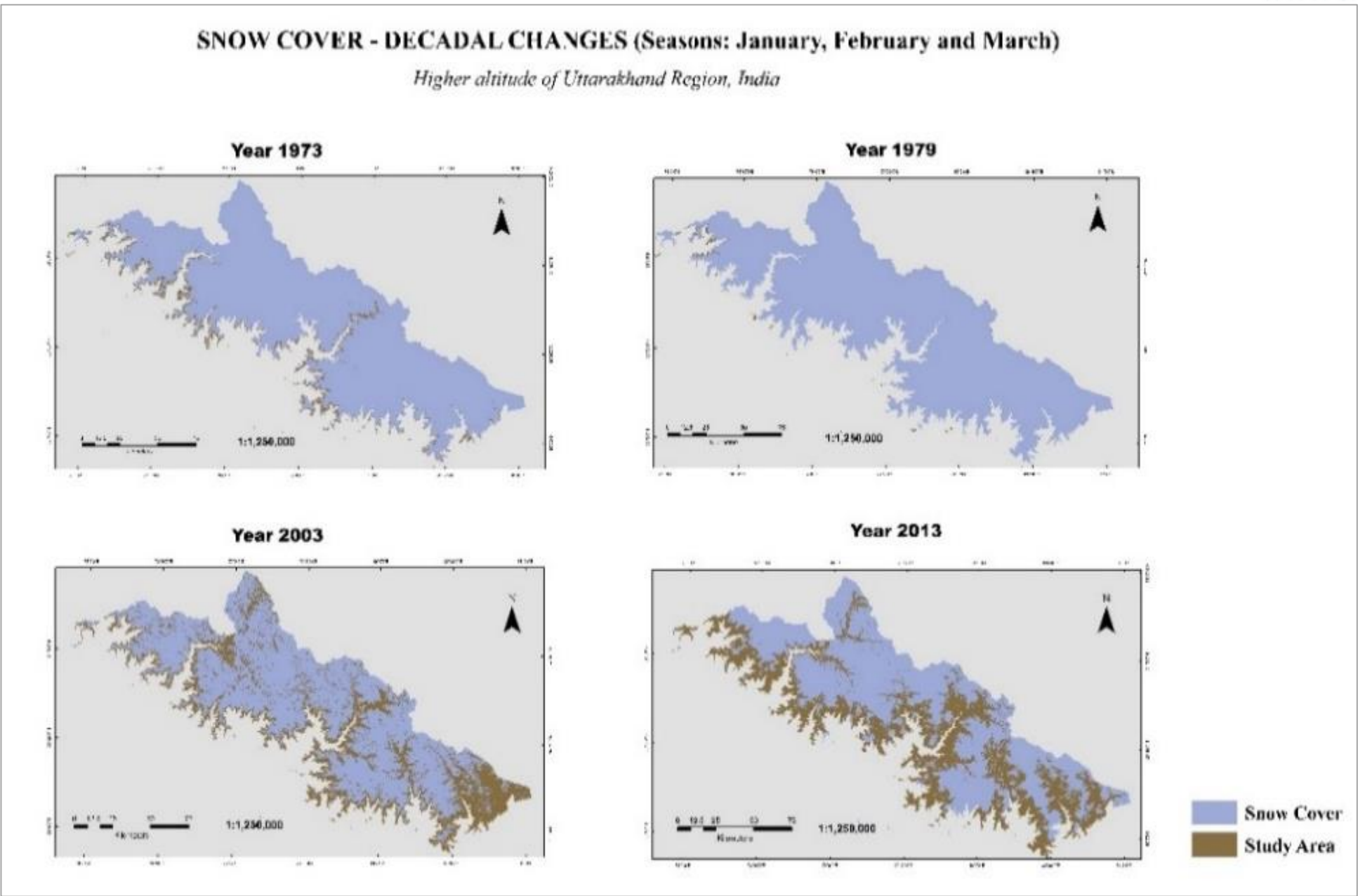
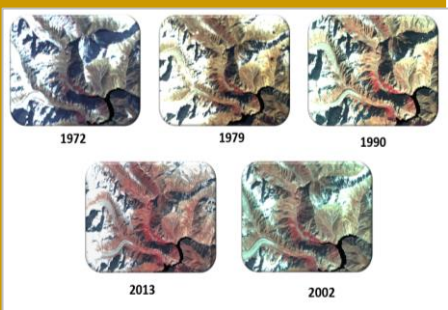
Higher altitude of Uttarakhand Region, India



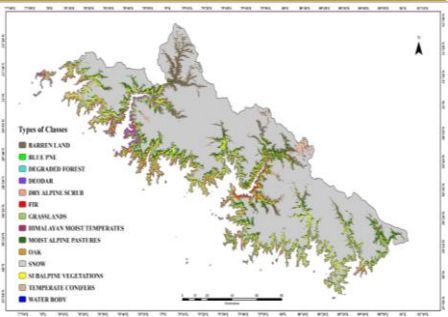
unraveling Intuitive Intelligence



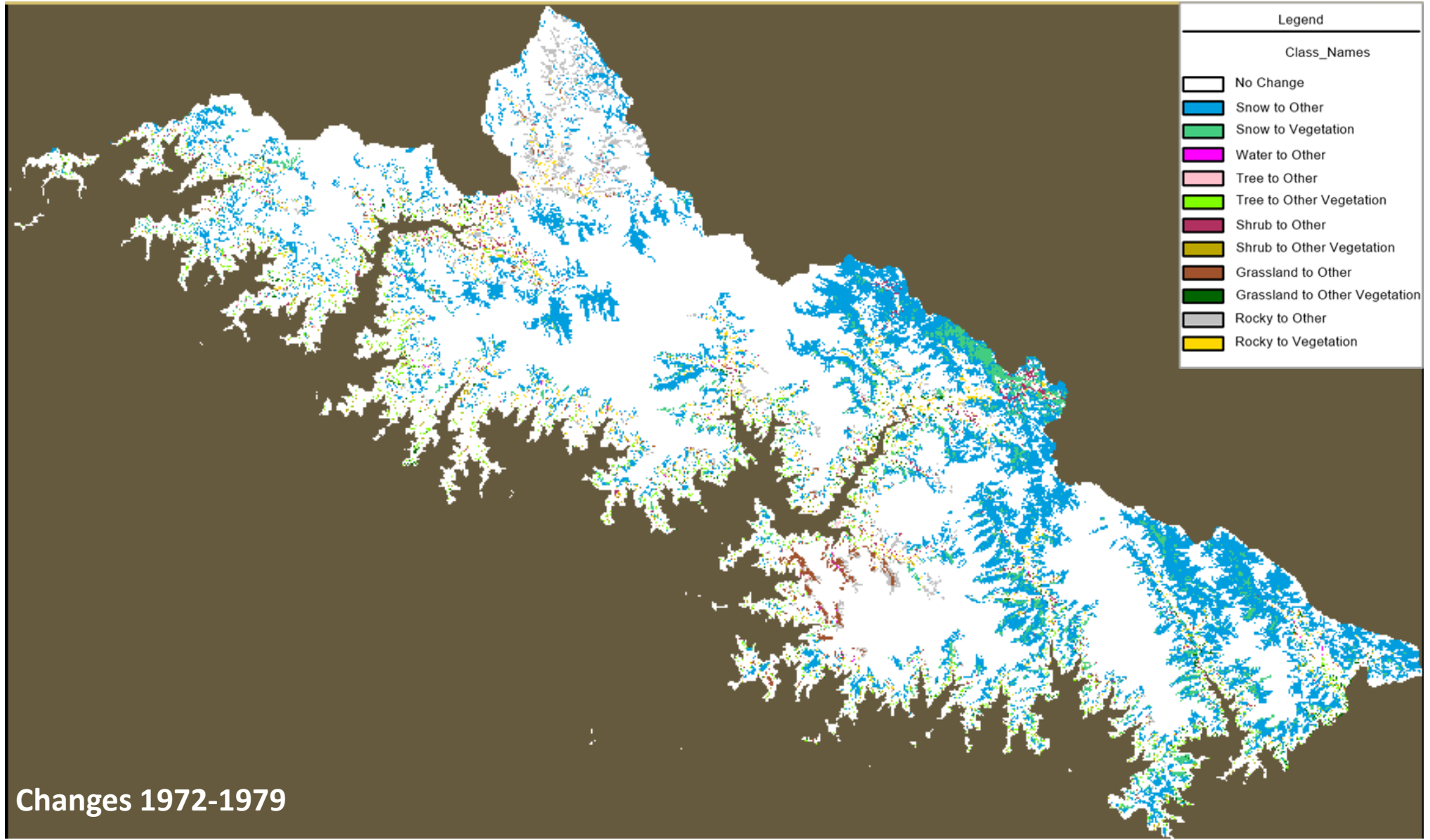
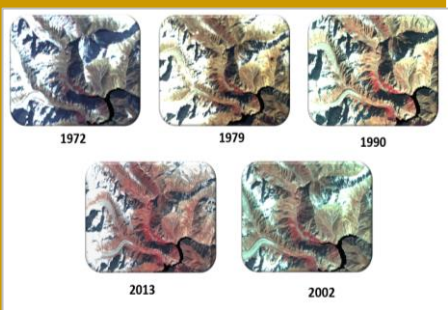
HIGH ALTITUDE DYNAMICS



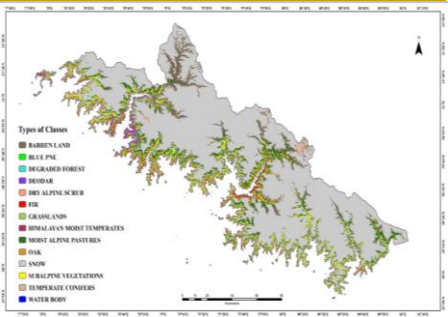
unraveling Intuitive Intelligence



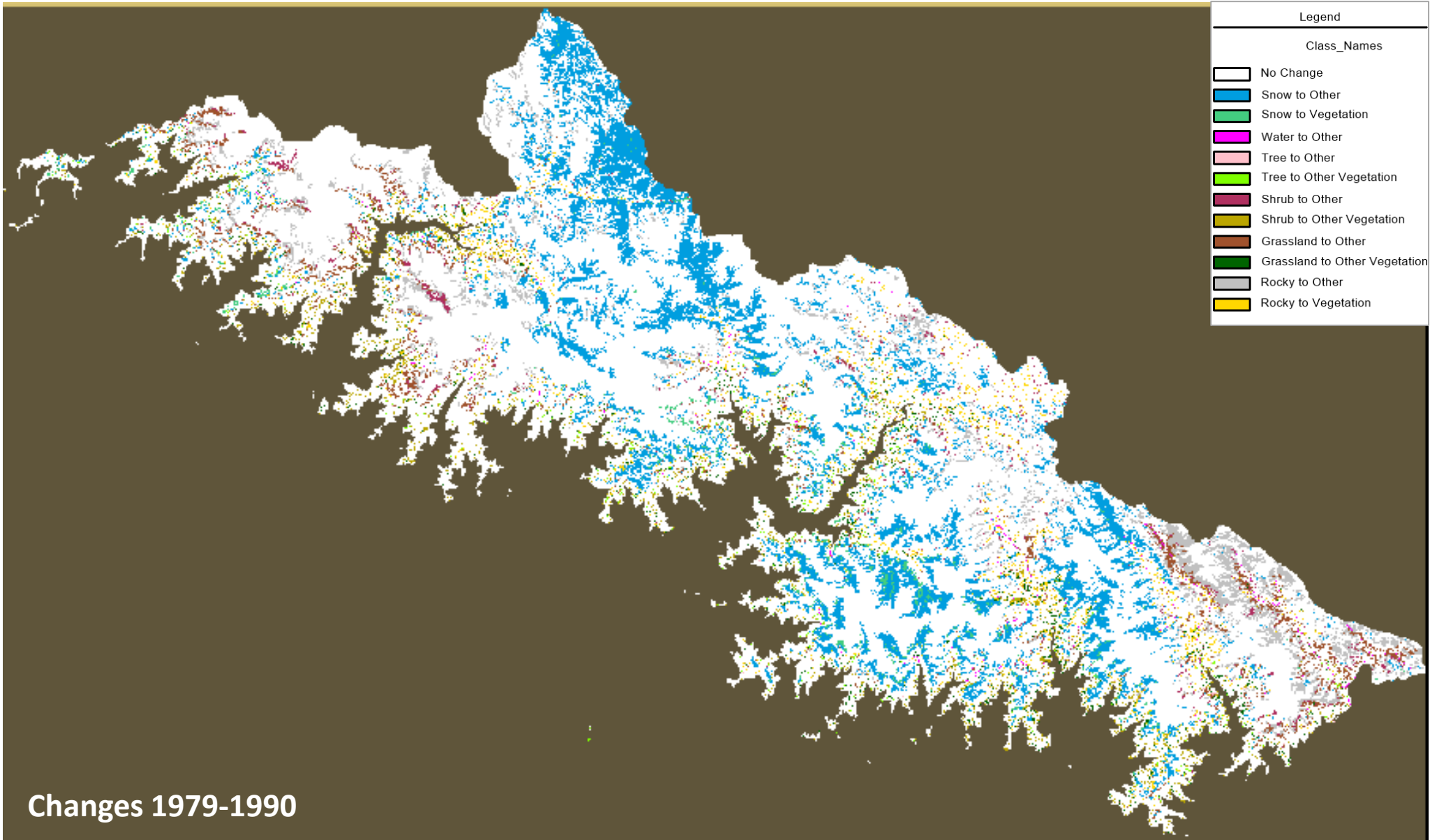
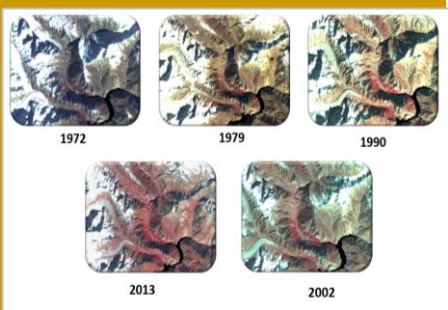
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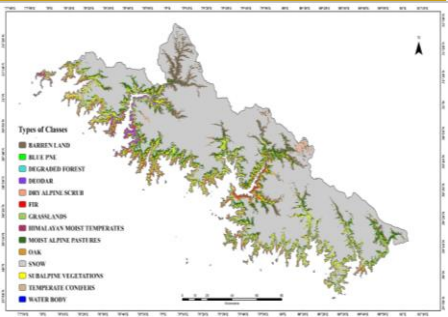
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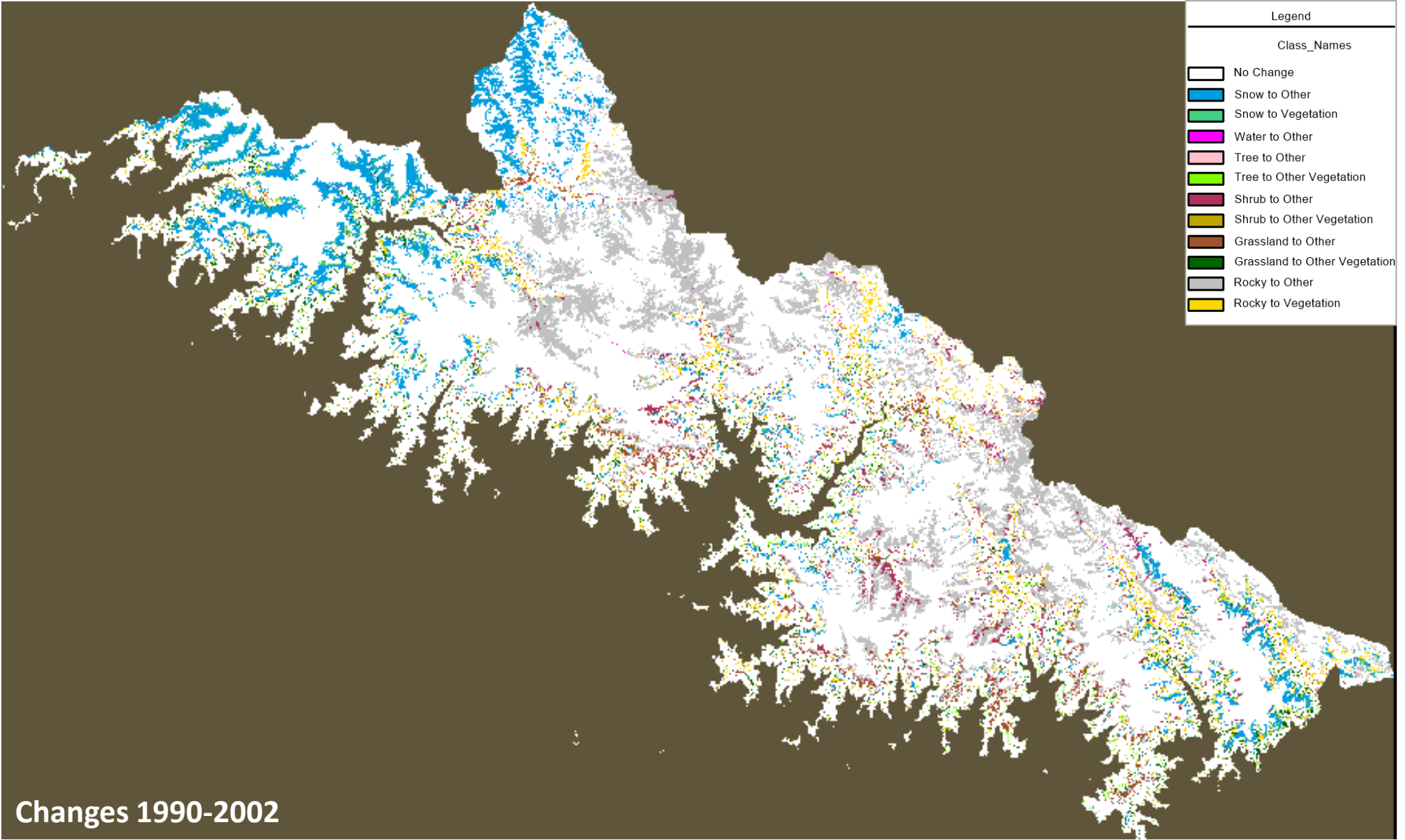
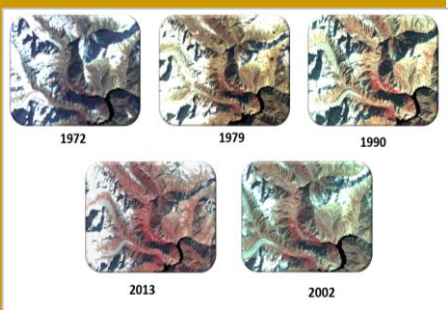
HIGH ALTITUDE DYNAMICS



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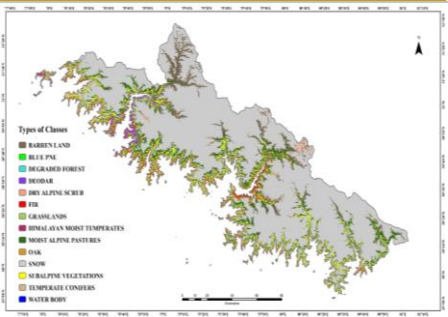


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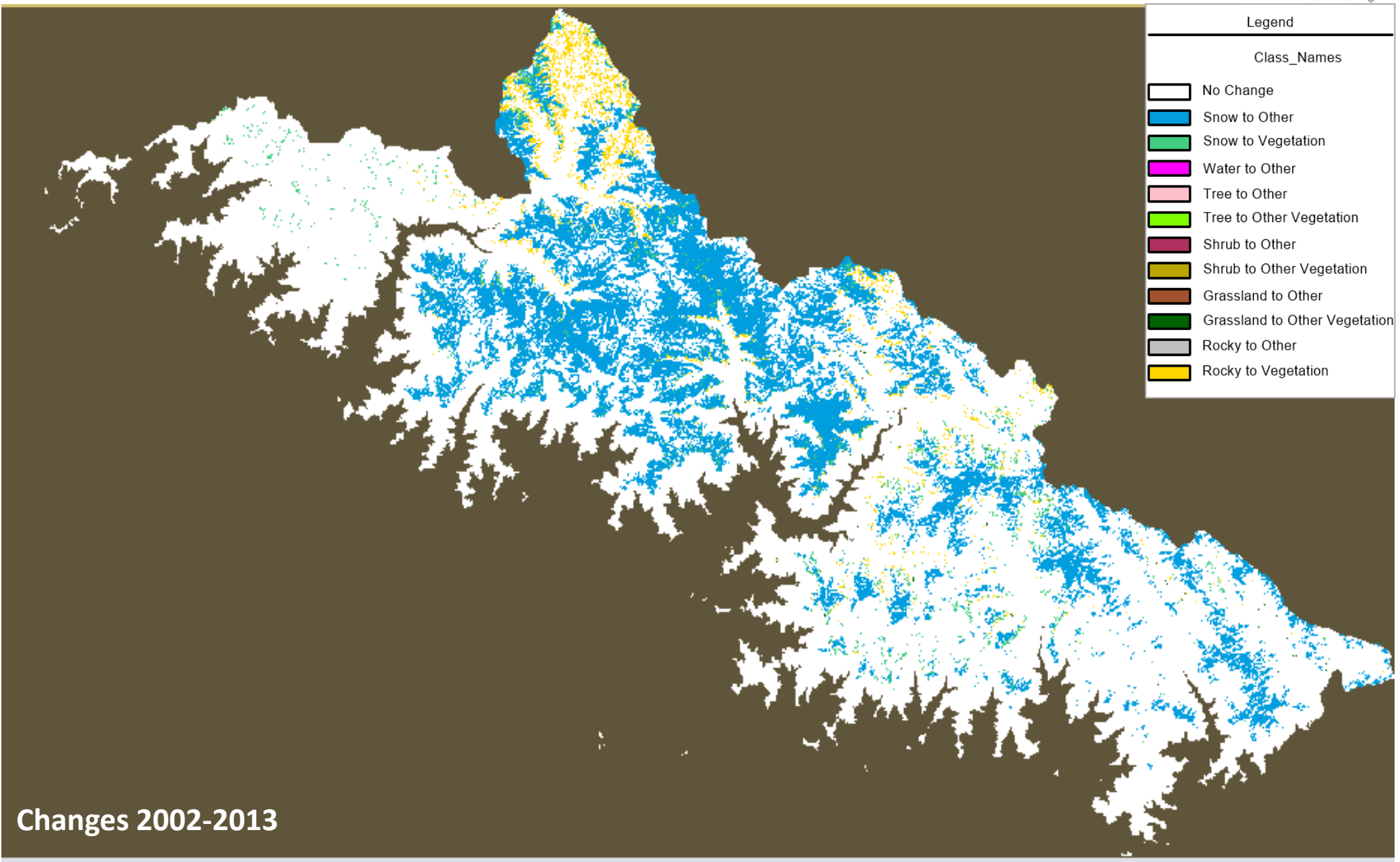
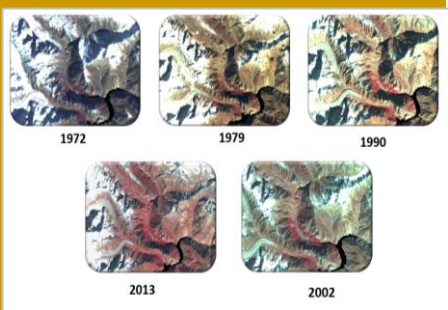


Changes 1990-2002

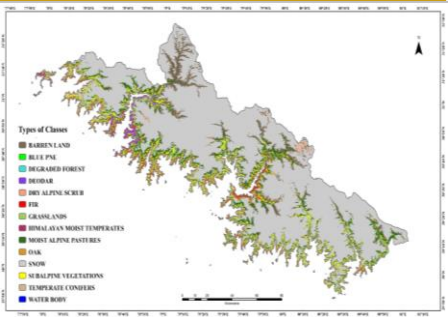
unraveling Intuitive Intelligence



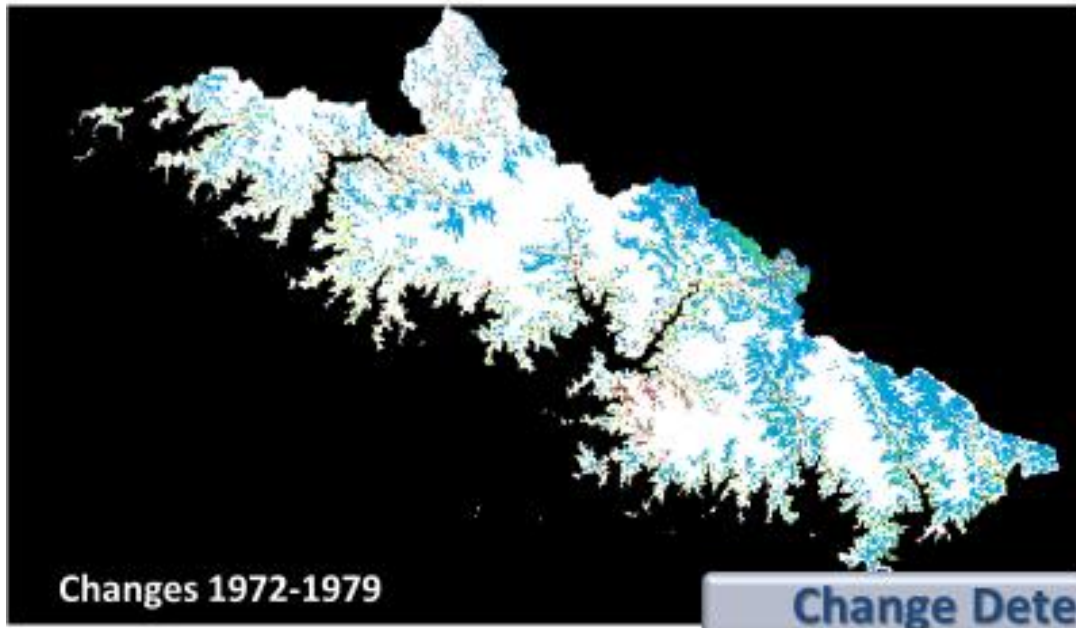
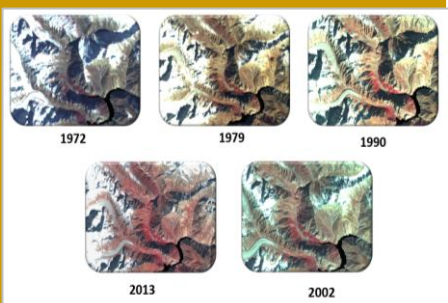
HIGH ALTITUDE DYNAMICS



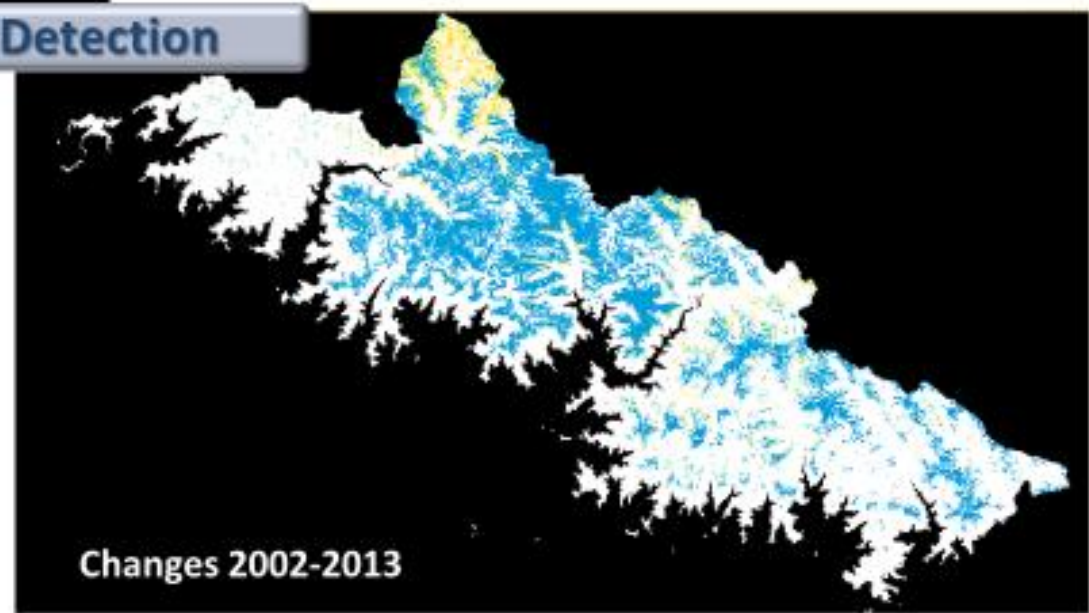
unraveling Intuitive Intelligence

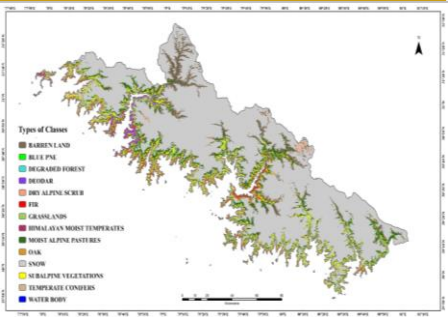


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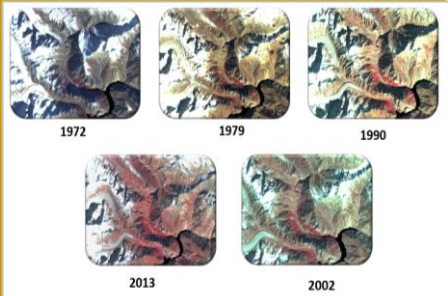


Change Detection





HIGH ALTITUDE DYNAMICS



1972-2002: No changes in land cover.
2002-2013: Snow cover started converting to barren lands

6500-7000

1972-2002: Snow melting into barren.
2002-2013: Dry Alpine Scrubs started emerging

5500-6500

1972-2002: Snow melting into barren.
2002-2013: Moist alpine pastures and dry alpine scrub

4500-5500

1972-2002: Snow to barren, alpine scrub and pastures.
2002-2013: Alpine Scrub to Sub-Alpine

4000-4500

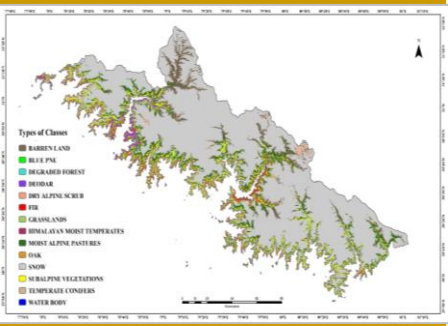
1972-2002: Alpine scrub to sub-alpine vegetation
2002-2013: Sub-alpine at these elevations changed to Pine forests

3500-4000

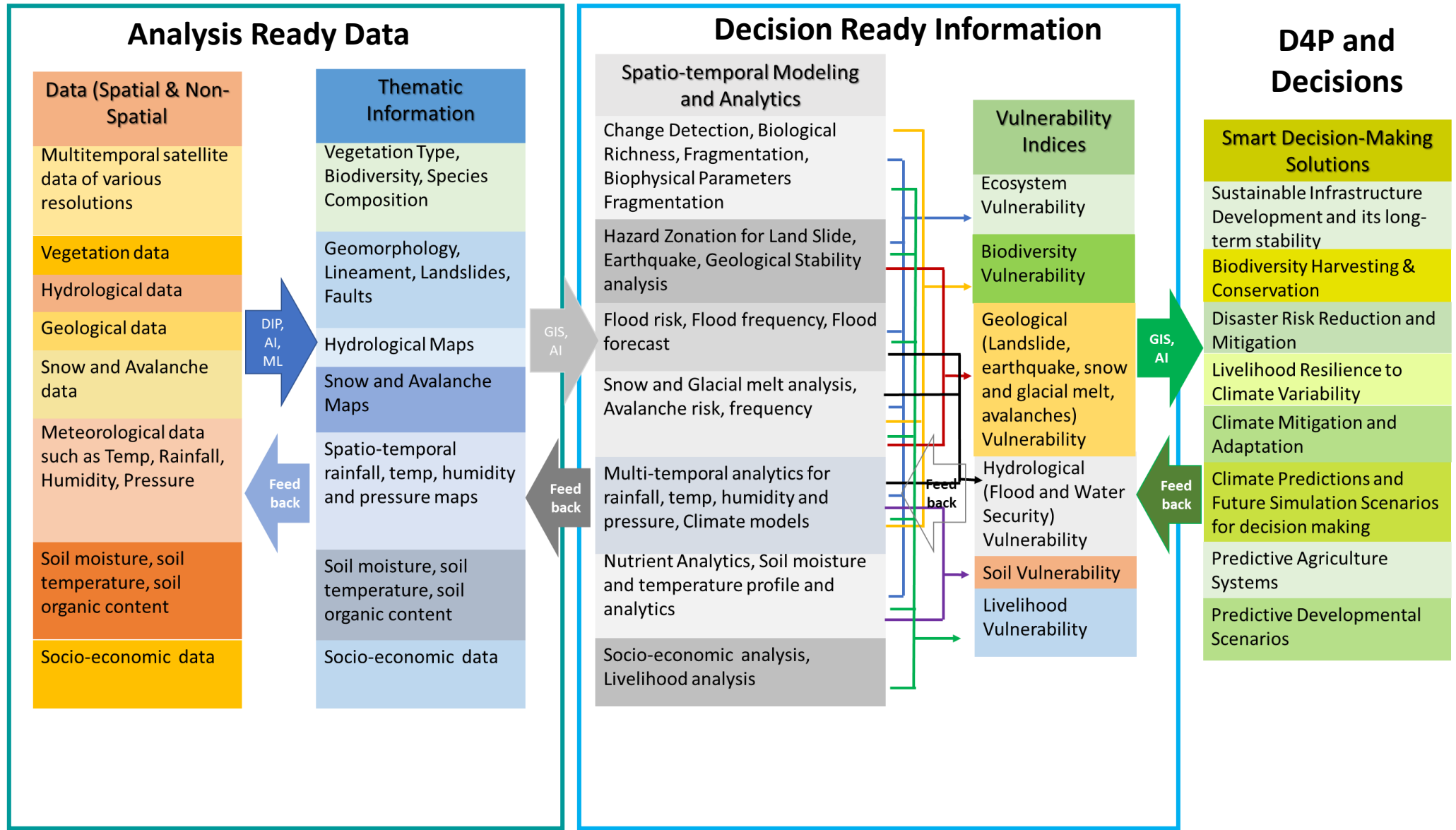
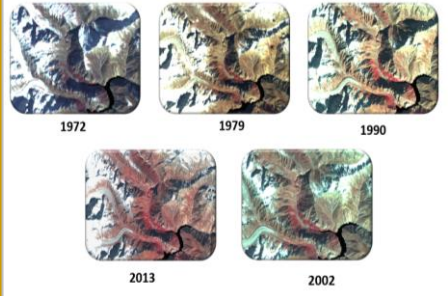
1972-2002: Scrubs to Sub-alpine, Conifers, Fir, Oak
2002-2013: Sub-Alpine to temperate conifers, Fir, Oak

3000-3500

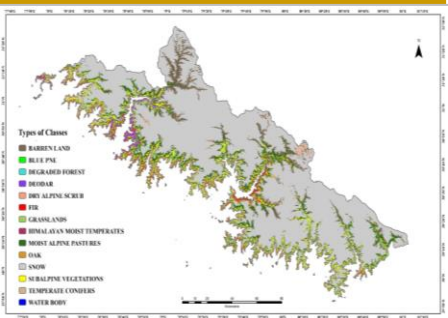
Overall Concept



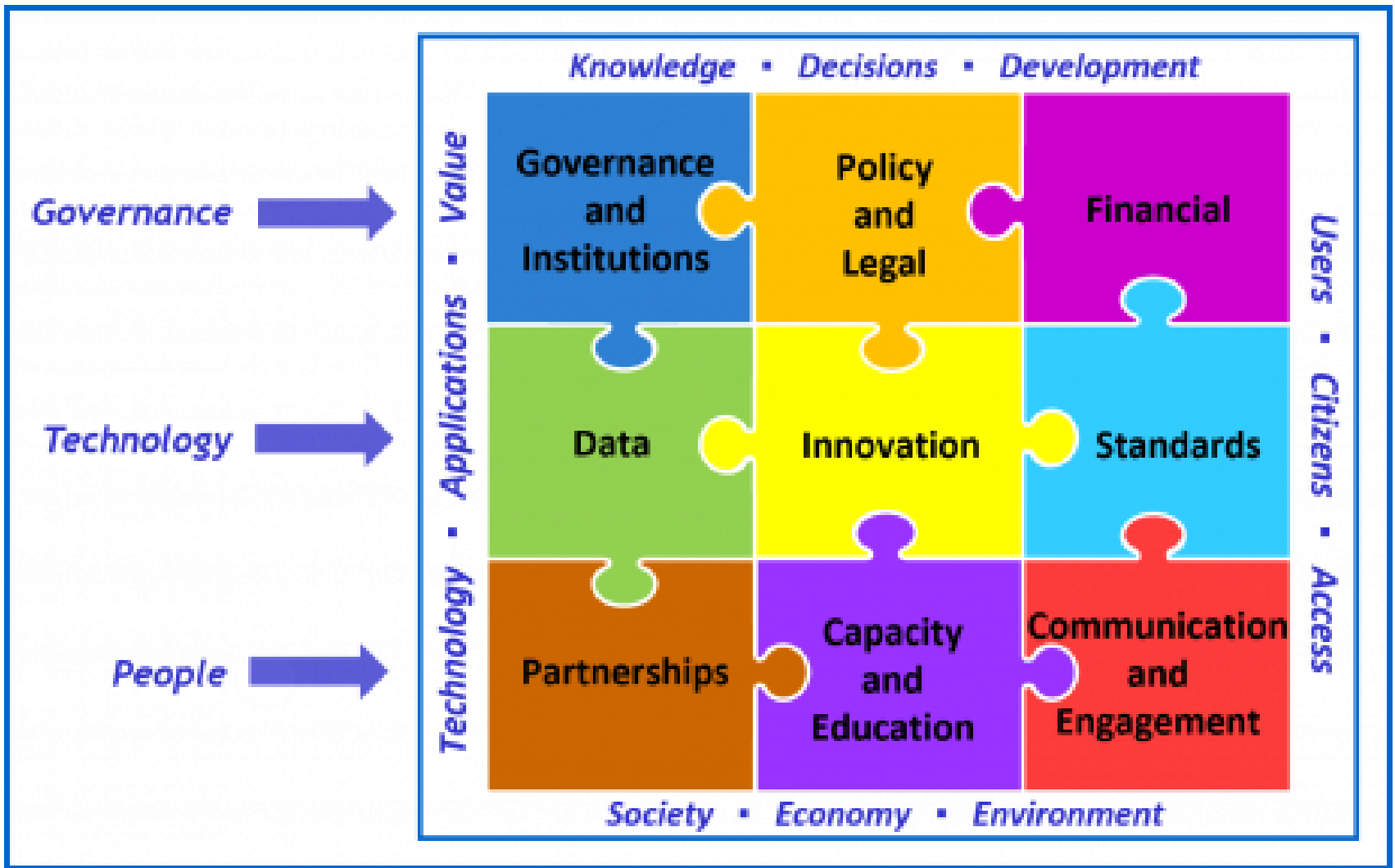
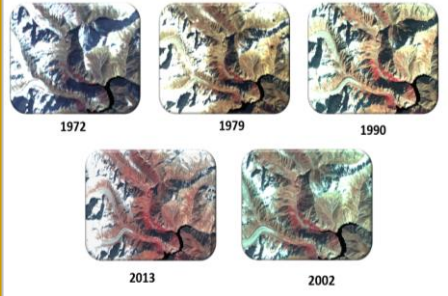
GEOAI KNOWLEDGE & INFORMATION INFRA FOR WESTERN HIMALAYAS



unraveling Intuitive Intelligence

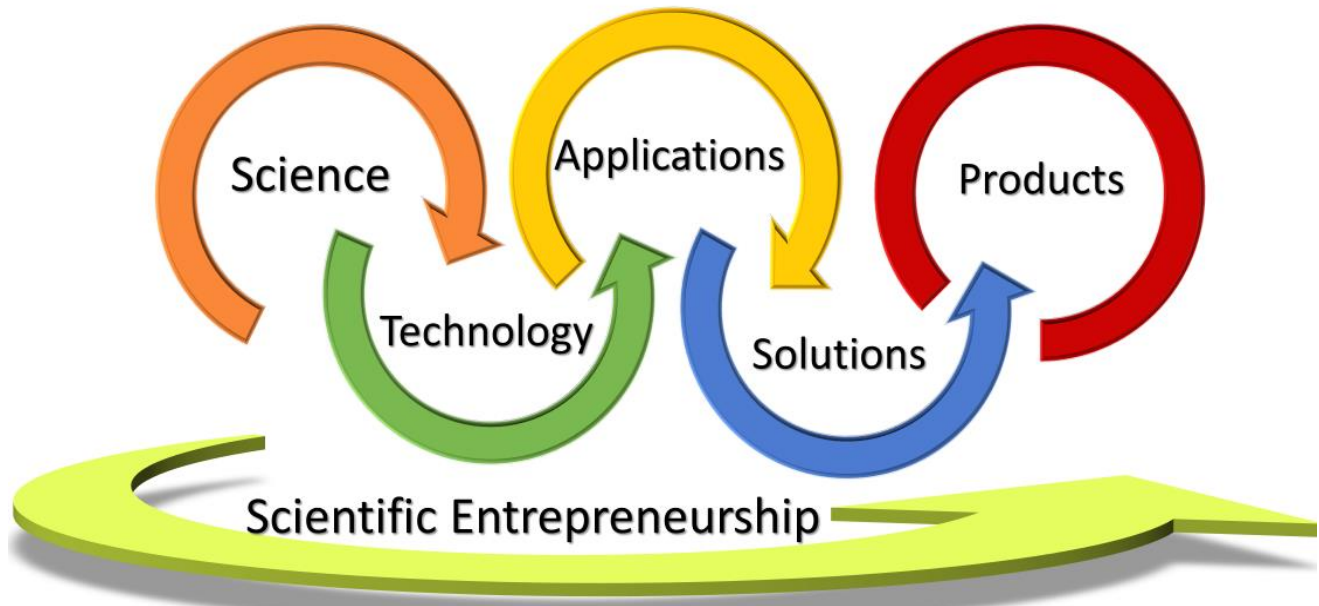


GEOAI KNOWLEDGE & INFORMATION INFRA FOR WESTERN HIMALAYAS

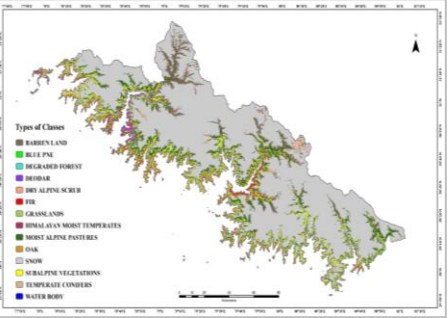


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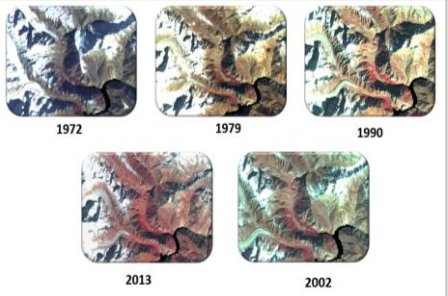
Science to Solutions



Process Flow from Science to Solutions and Products

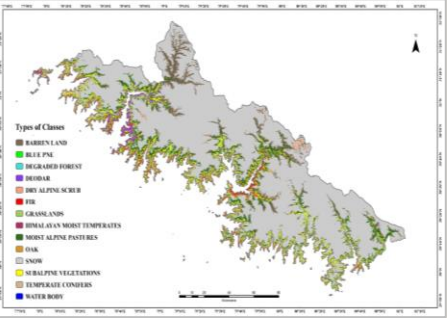


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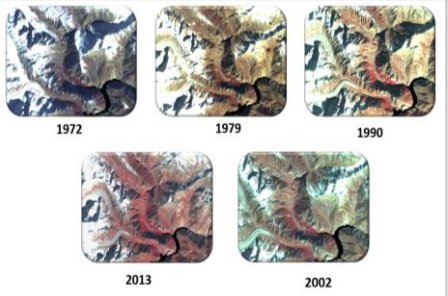


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Timelines



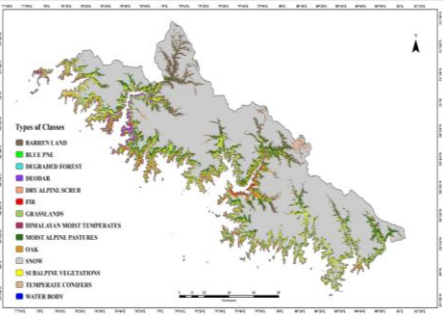
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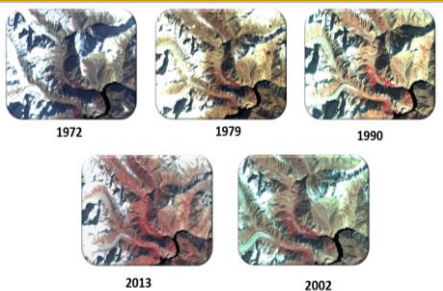
S.No.	Activities	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15		
1	Implementation of the pilot to develop smart DMS solutions that will be taken to market with industry collaboration	█																
2	Smart DMS Solutions and D4P framework transformed into products and with industry go for their marketing and sales on an ongoing basis with product/solutions improvements based on market demand						█											
3	Scale up the portfolio of products/solutions from high altitude Western Region to include entire Western Himalayan region and forge partnership with national and international institution working in the entire region						█											
4	Scale up the portfolio of products/solutions from high altitude Himalayan Region to include all the altitude regions of Himalayan region and forge partnership with national and international institution working in the entire region										█							
5	Product/Solutions improvement and ongoing development of new products/solutions along with their marketing and sales						█											

Work in Progress

- Multi-scale and multitemporal data processing of EO data from 2002 till date
 - Landsat 2002 –till date: To capture the inter and intra-annual dynamics of land cover changes especially snow cover
 - Sentinel 2013 – till date – To capture the inter and intra-annual dynamics of vegetation changes
 - LISS-IV datasets for 2013, 2017 and 2021 – To capture the changes in biodiversity, impact on ecosystems
- Multi-scale and multitemporal data collation
 - Historical Geological and other data being collated from Wadia Institute and IIRS
 - Existing Data from completed projects being collated



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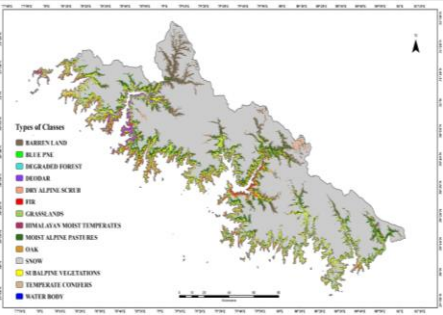


Collaborating Scientific and Academic Institutions

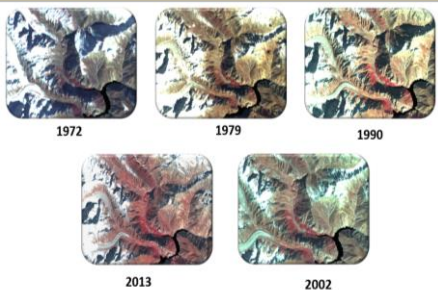
- Wadia Institute of Himalayan Geology
- Indian Institute of Remote Sensing
- Sido Kanu Murmu University
- K. J. Somaya College of Engineering
- Uttarakhand Open University

Supporting Institutions

- GISE Hub, IIT Mumbai



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Thank

You

