University of Zurich[UZH]

URPP Global Change and Biodiversity

Predicting the State of the Environment. Integrating Interactions, Feedbacks, and Scale.

WHAT WE DO

Biodiversity is both a response variable affected by global change drivers and a factor modifying ecosystem processes and services that are essential to human well-being. Improved capability to predict the consequences of changes in drivers will aid improved prediction of the state of the environment.

Two different types of global change drivers affect biodiversity:

WORLD DRIVERS
social, economic, and political change (e.g. land use changes, pollution, exploitation)

EARTH DRIVERS
biophysical, chemical and structural change (e.g. climate change, species invasions)

These two types of drivers co-exist, overlap and influence each other. Their influence takes place on different temporal and spatial scales. Central to the approach is the integration of the physical representation of the Earth System with stakeholder and ethical views of our World.

AIM: To predict the consequences of global change and their different drivers for biodiversity, ecosystem services and ultimately human well-being.

CONCEPTUAL CLUSTER

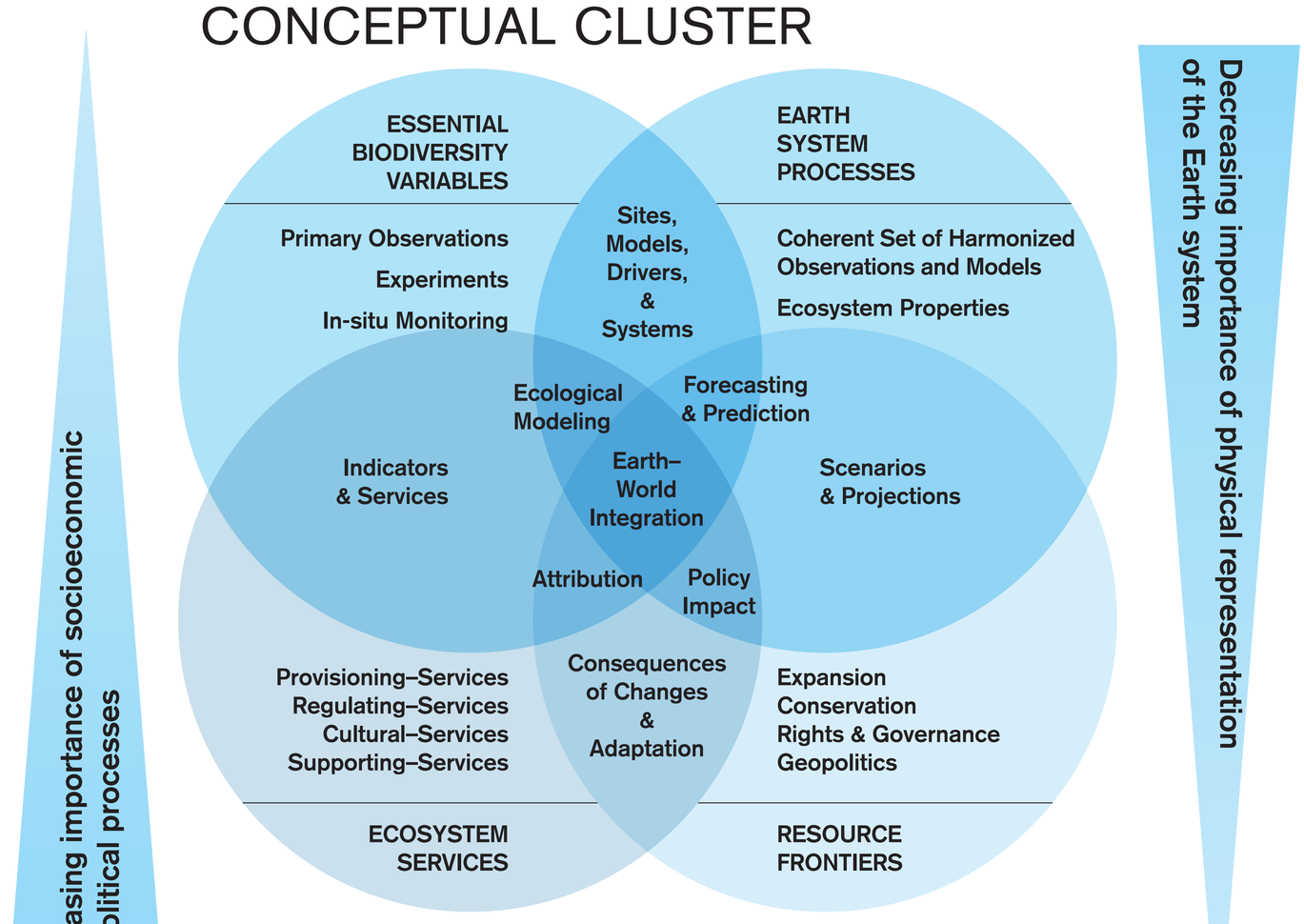


Figure 1: The conceptual structure of Phase II, 2017 – 2020 is a clustered approach to the science challenges in the URPP 'Global Change and Biodiversity'. As a functional application of the cluster approach the projects are placed into working groups: Networks, Humans, Landscapes and Traits. The working groups, integrating the clusters, will foster a coherent research approach in Phase II.

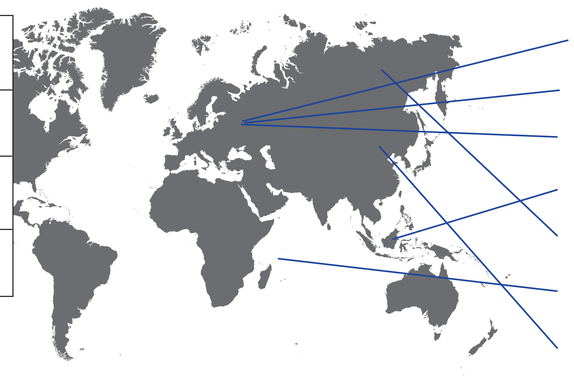
RESEARCH WORKING GROUPS

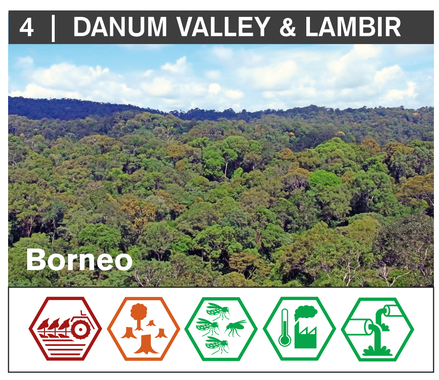
NETWORKS	N-SystEMiC	System Efficiency of Microbial Consortia
	N-Aldabra	Integrating changing habitats in future climate scenarios on Aldabra and understanding impacts on biodiversity
	N-EnviroGenomics	Community-wide ecological genomics to monitor environmental responses: drought, phenology and biodiversity effects
	N-Ecoforecast	Advancing forecasting of ecological dynamics in changing environments
	N-bioDISCOVERY	Development of policy engagement, international collaborations and sustainable research
HUMANS	H-Images	The imagination of the resource frontier
	H-ESEthics	Integrating the concept of "Ecosystem Services" into an ethical framework that considers human responsibilities towards nature
	H-RFTibet	Expansion of the resource frontier in the Tibetan Plateau
	H-Innovation	From environmental conflict to congruence: developing a relational values approach to align environmental values in conservation policy
LANDSCAPES	L-DataAssim	Detection and space-time modeling of biome transition zones
	L-DivProd	Biodiversity-ecosystem functioning relationships at the landscape scale
	L-eDNA	Assessing biodiversity and carbon fluxes across the Land-Water interface by integrating environmental DNA and remote sensing
TRAITS	T-UpScaleFunc Traits	Large-scale distribution of functional diversity using trait-based approaches and remote sensing observations
	T-RSGenTraits	Linking remotely sensed trait information to phylogenies and genetic structure to infer partial taxonomies of regional communities
	T-BioAtmos	Feedbacks between biodiversity and climate through plant traits and light interaction
	T- BioSpec	Biogeochemical ground truthing of remotely sensed plant traits
	T-ARES	Airborne Research Facility for the Earth System

DRIVERS OF GLOBAL CHANGE

CLIMATE CHANGE | HABITAT CHANGE | POLLUTION | OVEREXPLOITATION | INVASIVE SPECIES

VERY HIGH
HIGH
MODERATE
LOW





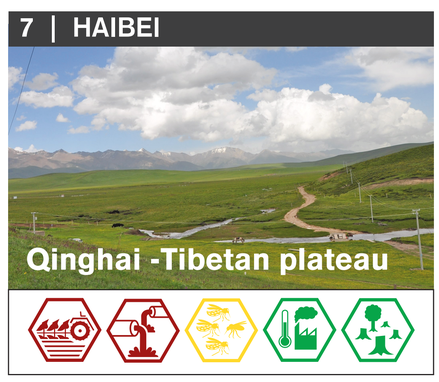


Figure 2: Seven experimental systems cover a latitudinal gradient in biodiversity with a multitude of drivers affecting each site's condition.

Who we are

FIVE INSTITUTES:

Department of Evolutionary Biology and Environmental Studies

Department of Geography

Department of Mathematics

Department of Plant and Microbial Biology

Zurich University Centre for Ethics

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Please contact us to learn more about the programme, and find out about opportunities to collaborate.