

ECOSYSTEM VALUES ASSESSMENT & ACCOUNTING (EVA) PILOTING EXPERIMENTAL ECOSYSTEM (EEA) IN SAN MARTIN, PERU

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New York





EVA: A RESEARCH PROJECT

To design and field test a framework for incorporating nature's values into decision-making

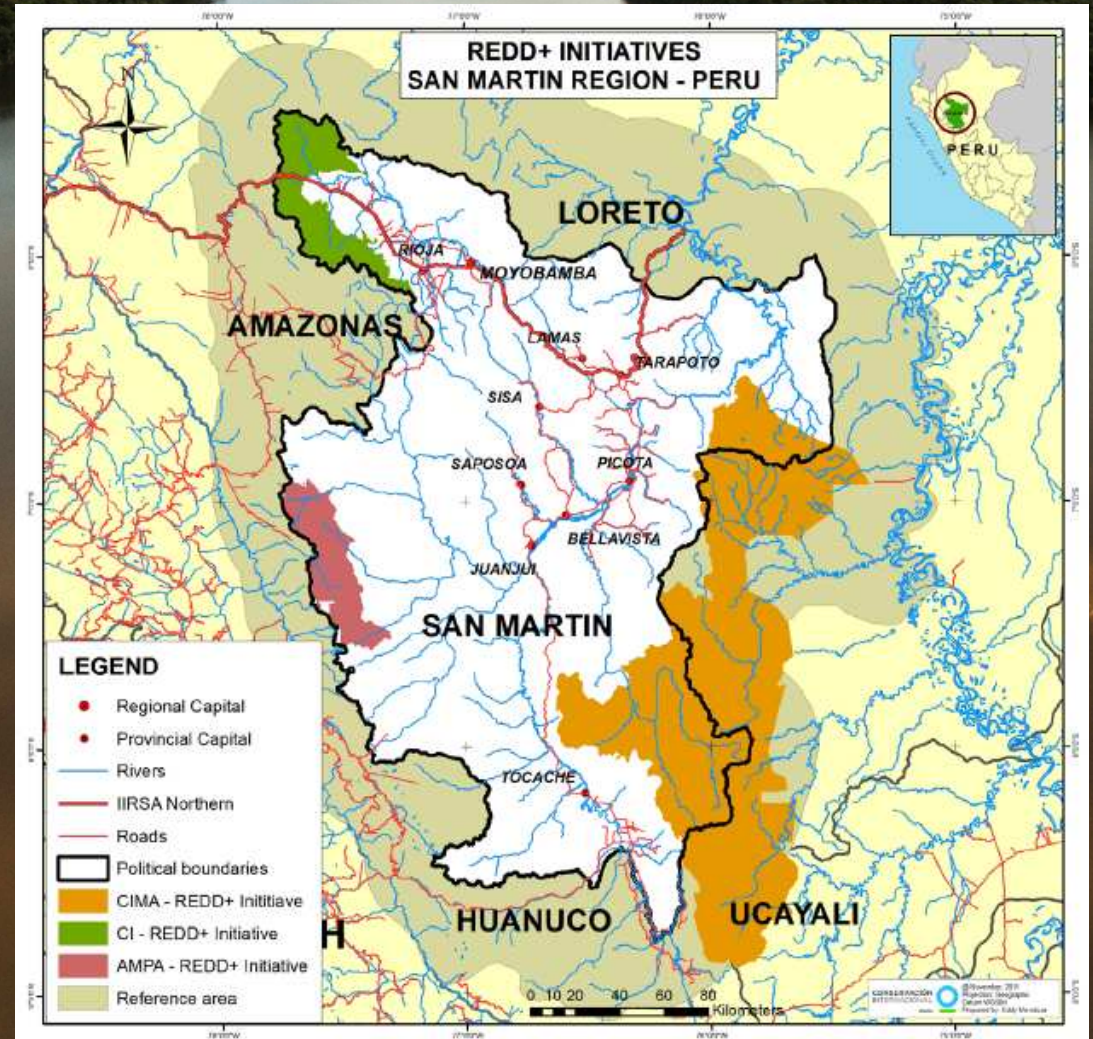
Focus: Piloting Experimental Ecosystems Accounting in San Martin, Peru

Funded by the Moore Foundation

Implemented by CI MCSO, CI Peru with support from National Gov. of Peru and Gov of San Martin, World Bank, Wageningen University, ESA.

SAN MARTIN REGION

- Located at the foothills of the Andes in the Upper Amazon River basin with high biodiversity and ecosystem services provision but also highly threatened.
- Area: 5.12 million ha
- Mostly tropical forests and wetlands.
- High deforestation rates, caused mainly by immigrants and development efforts (1.6 million ha lost).
- Ecosystem Accounting chosen as primary focus of EVA



EVA: POLICIES UNDER CONSIDERATION

Strategic goal	National	Regional	EVA's Potential Contribution
<i>Sustainable economic development</i>	<i>Foster sustainable activities in ecosystems with little or no intervention (Amazon) and in transformed ecosystems</i>	<i>Foster sustainable forestry, agriculture, tourism, aquaculture</i>	<i>Estimate productive capacity, sector efficiency use of natural resources, ID attractive and suitable areas for activities SLP: Sustainable Landscape Partnerships</i>
<i>Ecosystem-based management approaches</i>	<i>Promote the integrated management of watersheds Improve water availability (priority use by agricultural sector)</i>	<i>Protect ecosystems (headwaters of various water bodies that supply economic production).</i>	<i>Identify critical areas for supply of water regulation (quantity and quality)..</i>
<i>Environmental regulation and management</i>	<i>Improve management of territory (reduce deforestation and promote conservation and sustainable use of forest)' Valuation of ecosystem services Provide evidence and incorporate the value of the services in environmental national economy</i>	<i>Promote biodiversity conservation and protection of key ecosystems (goal: protection of 65% of territory)' Promote adequate environmental management planning (EIA, economic valuation, PES, etc) and implementation (restoration, mitigation, protection)</i>	<i>Identify tradeoffs and impacts of land use change on selected economic sectors, potential for compensation mechanisms Guidelines for environmental compensation, EIA, fines, elimination of perverse incentives, implementation of compensation schemes, etc</i>

CONCEPTUAL FRAMEWORK

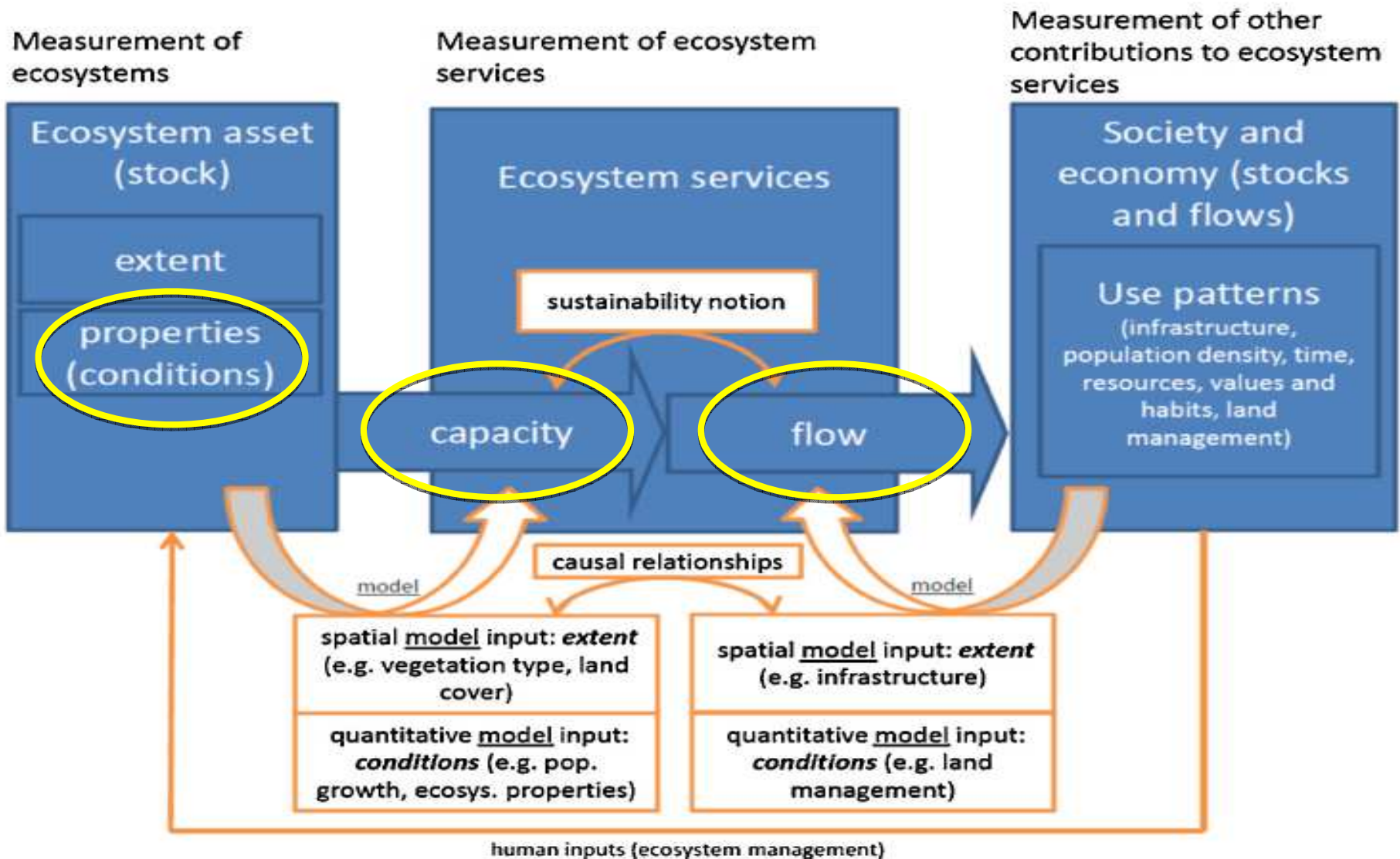


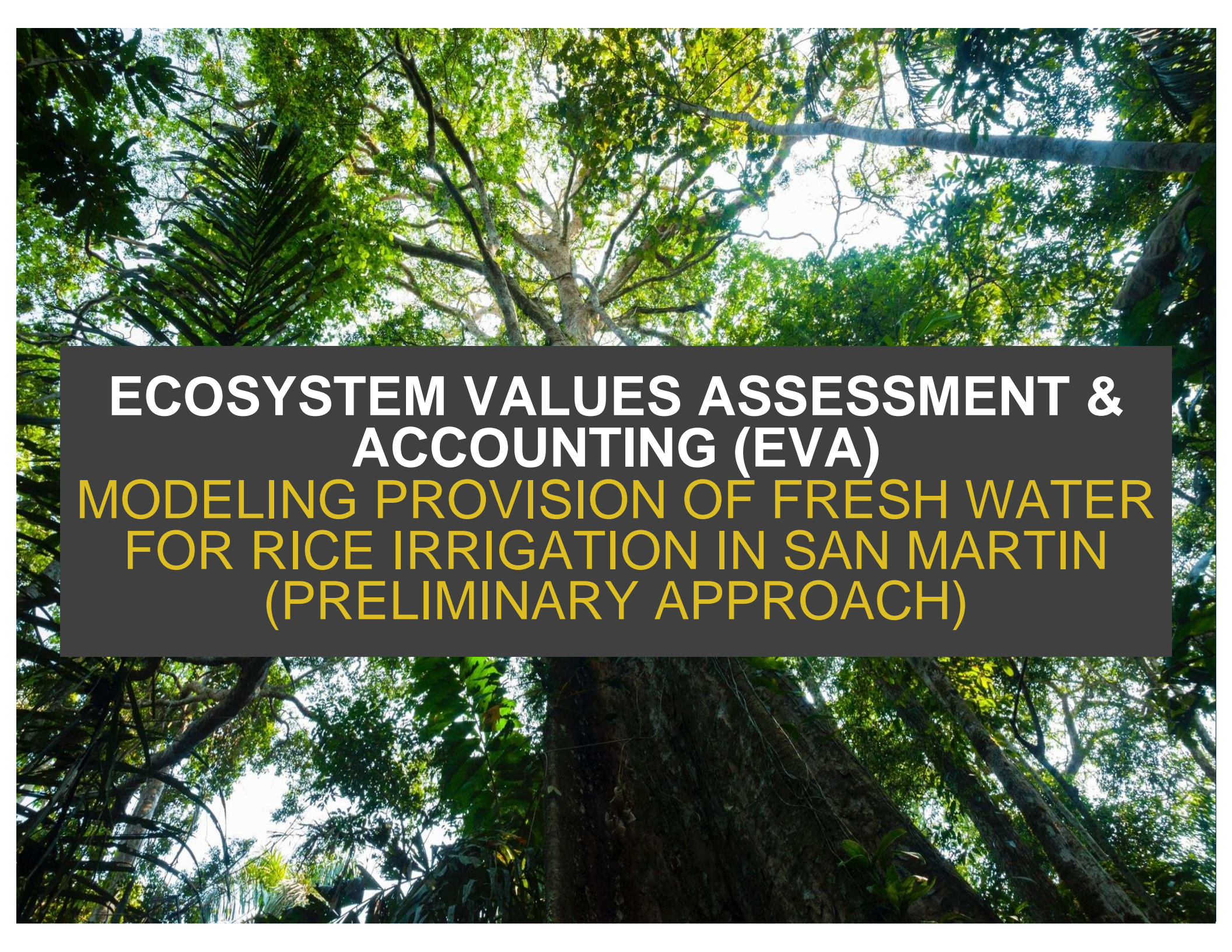
Fig. 1. Integration of ES capacity and flow models in ecosystem accounting.

Ecosystem Accounting

Ecosystem	Bio-physical	Monetary
I. Condition	X	
II. Capacity	X	X
III. Flow	X	X



Stakeholders / Beneficiaries / Sectors



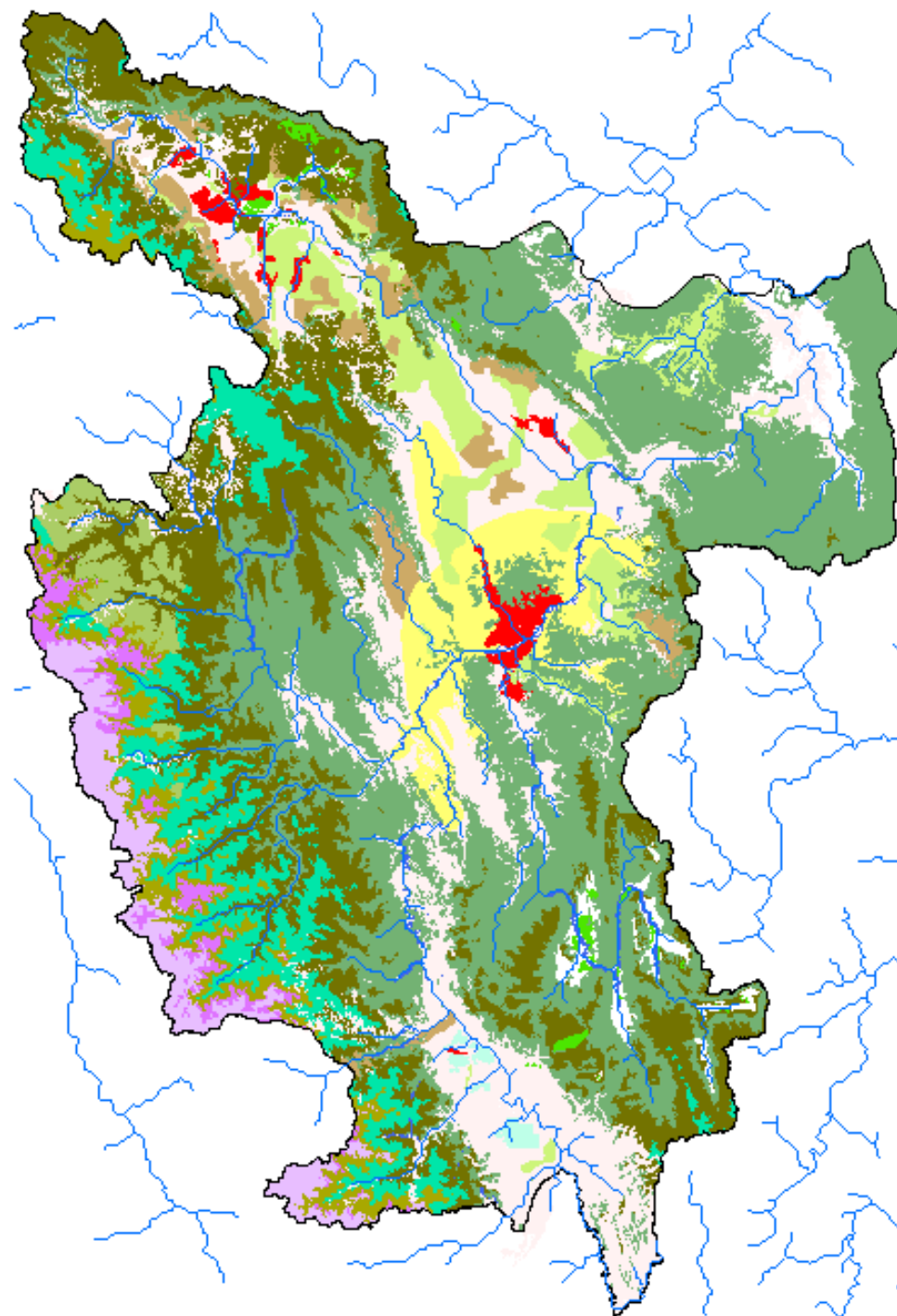
**ECOSYSTEM VALUES ASSESSMENT &
ACCOUNTING (EVA)**
MODELING PROVISION OF FRESH WATER
FOR RICE IRRIGATION IN SAN MARTIN
(PRELIMINARY APPROACH)

Ecosystems/land use/ES

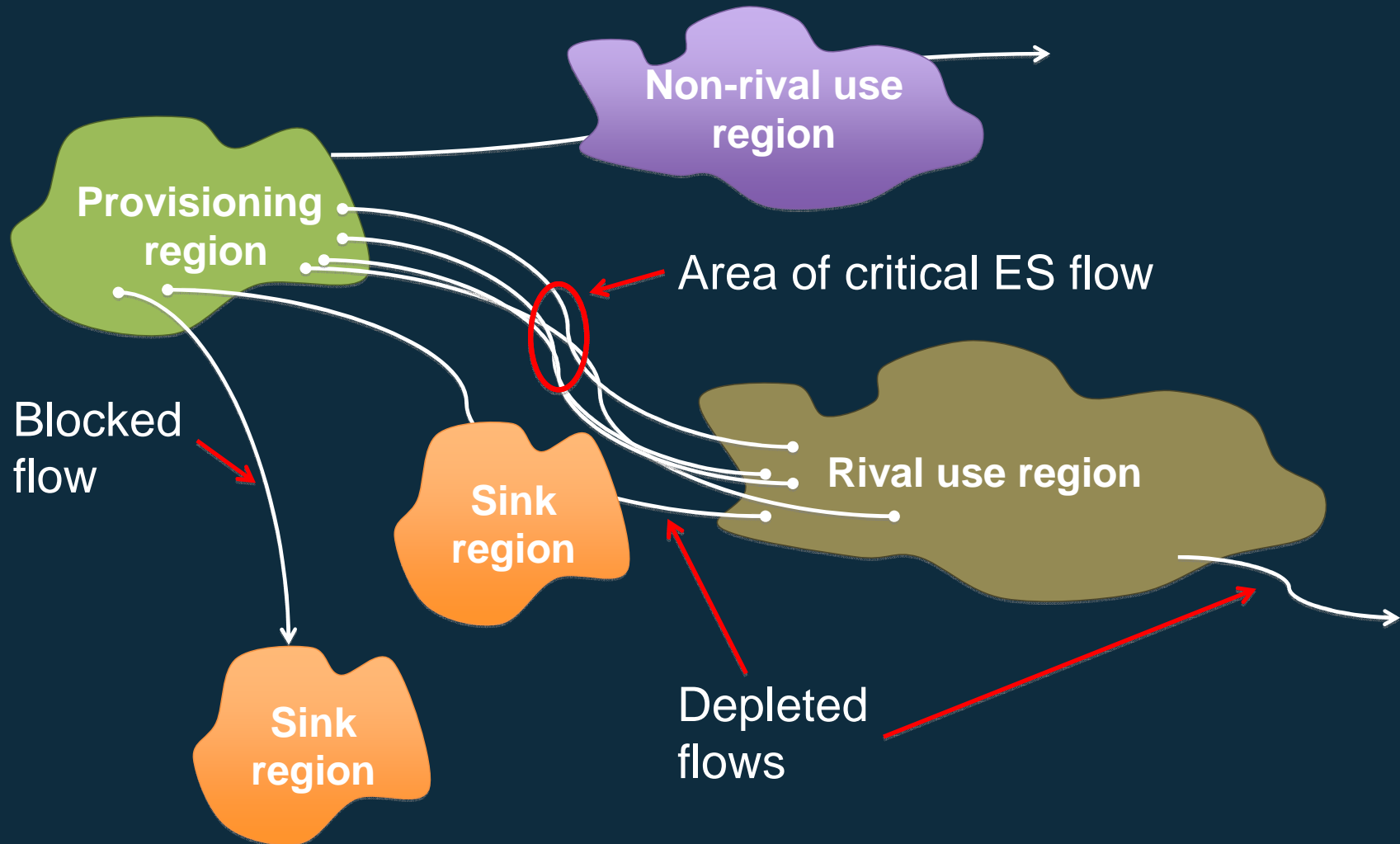


Ecosystems/land use (Comunidad Andina/ GORESAM)

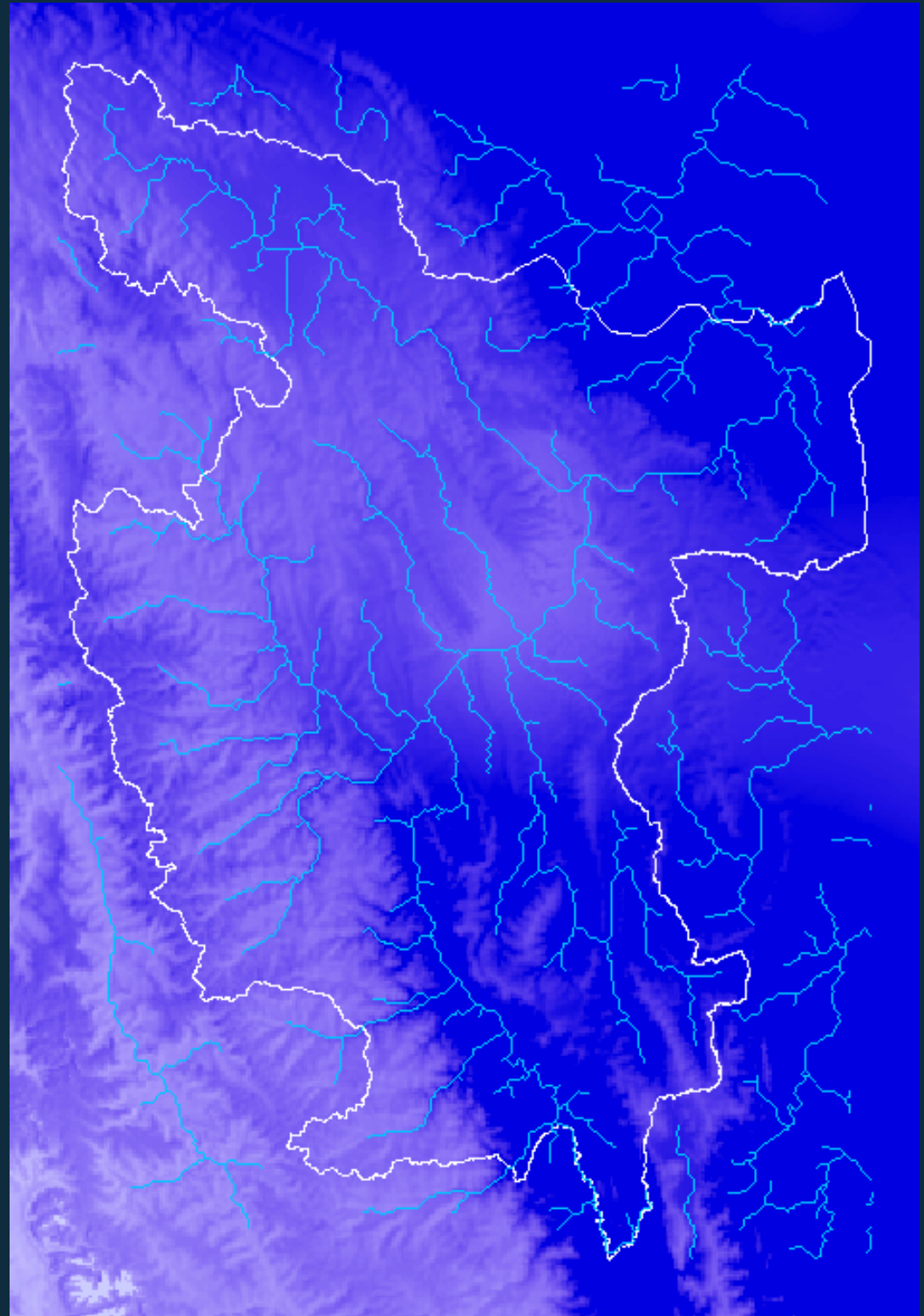
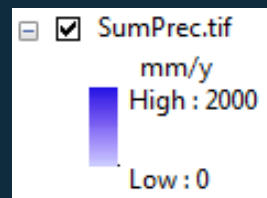
- SM_Usos_Actual_utm18s
DES_USOS
 - Frente productivo de predominio arrocero
 - Frente productivo de predominio cafetalero
 - Frente productivo de predominio de agricultura diversificada
 - Frente productivo de predominio de palma aceitera
 - Frente productivo de predominio ganadero
 - Frente productivo de predominio maicero
- Sistemas_andinos_DD_afiche_C
MACROGRUPO
 - AMAZONIA
 - Arbustal montano xerofitico de Yungas
 - Areas intervenidas
 - Bosque altimontano y altoandino humedo de Yungas
 - Bosque humedo de las Cordilleras Subandinas Orientales
 - Bosque montano humedo de Yungas
 - Bosque montano xerofitico de Yungas
 - Bosque subandino humedo de Yungas
 - Cuerpo de agua
 - Nival
 - Pajonal arbustivo altimontano y altoandino estacional de Yungas
 - Pajonal arbustivo altimontano y altoandino humedo de Yungas



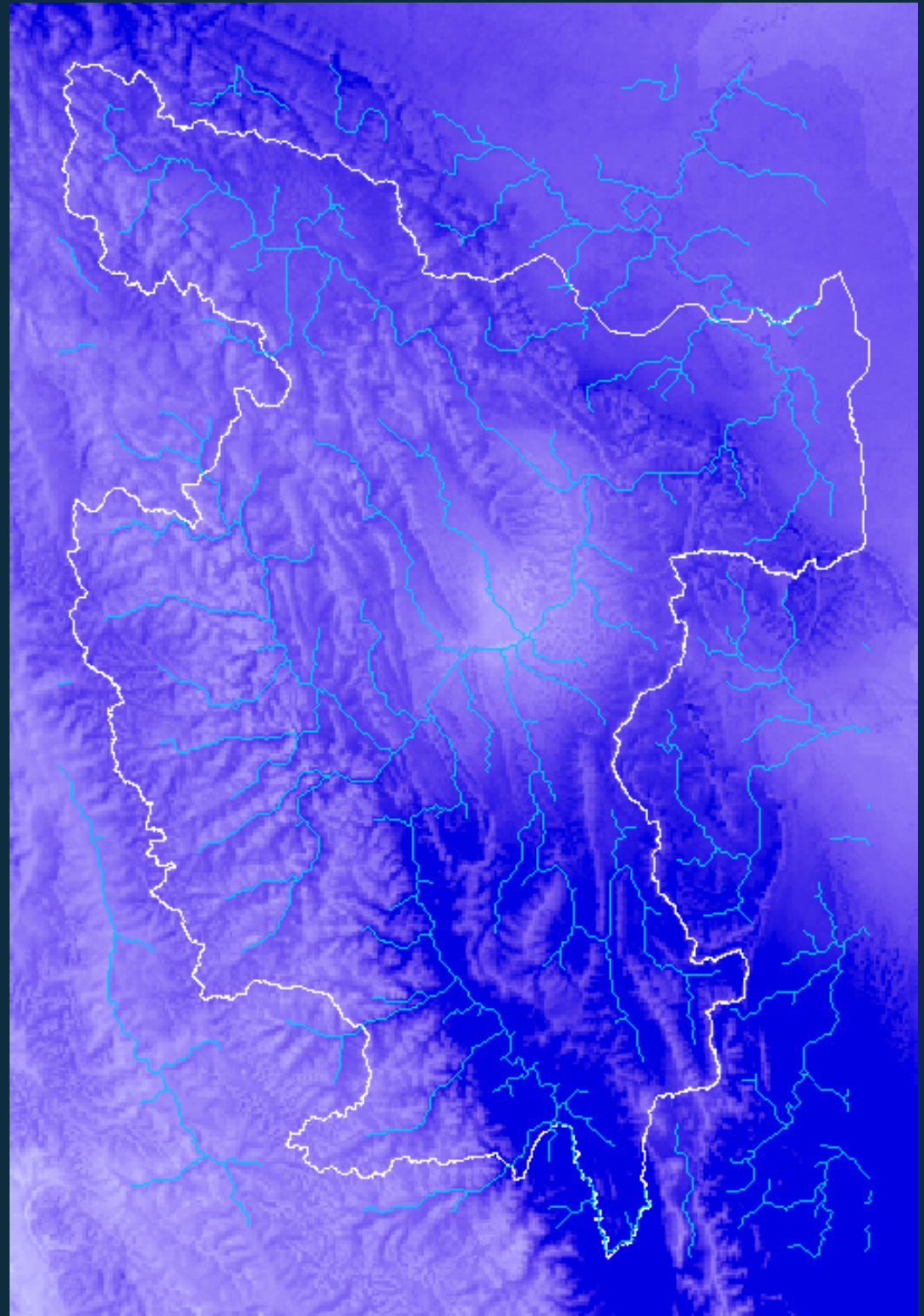
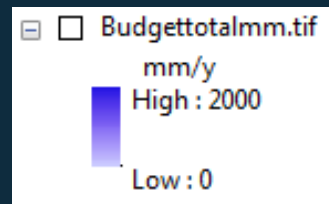
Modeling Service Flows using ARIES – WaterWorld



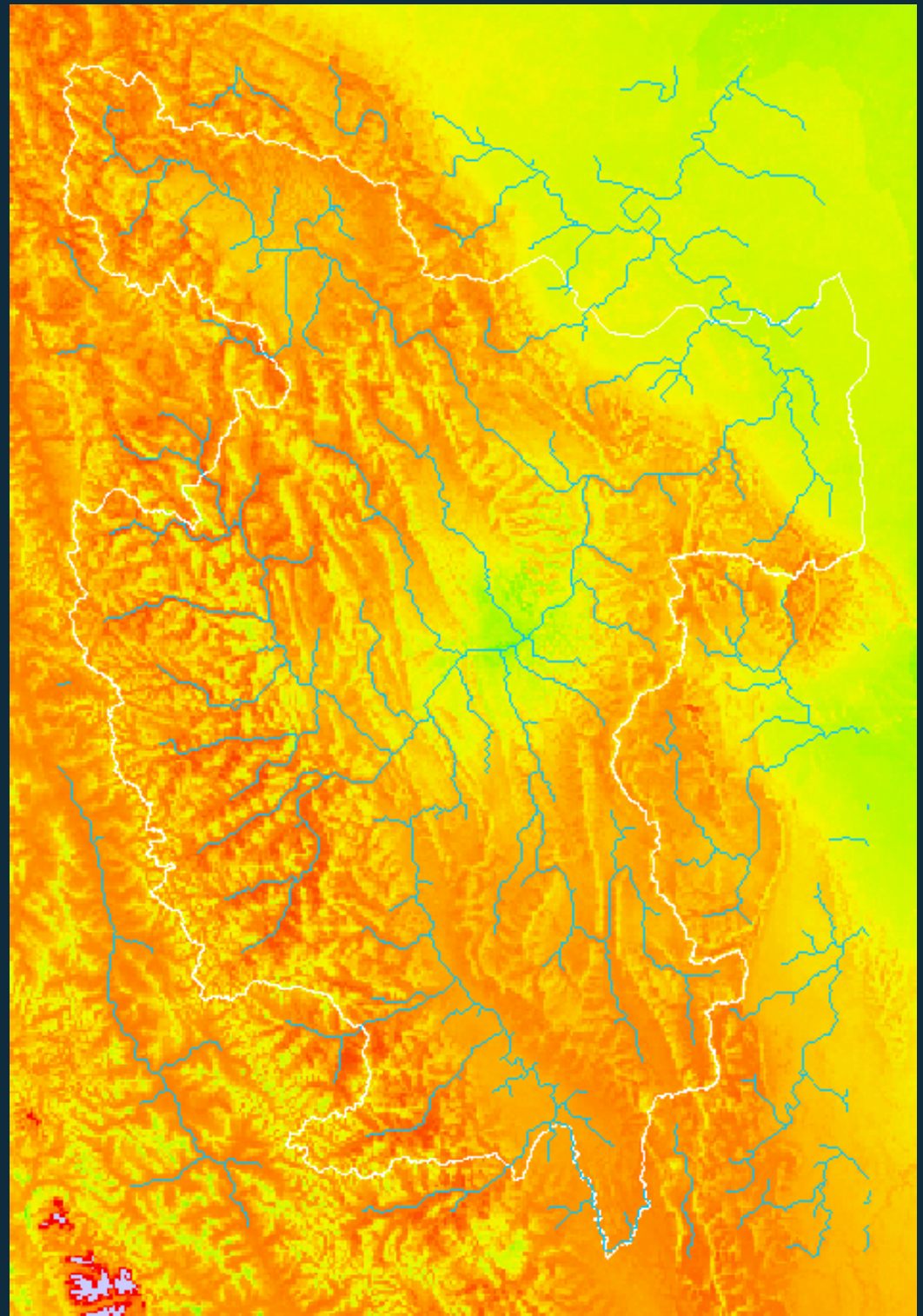
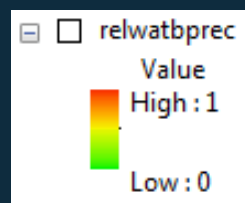
Precipitation (WaterWorld)



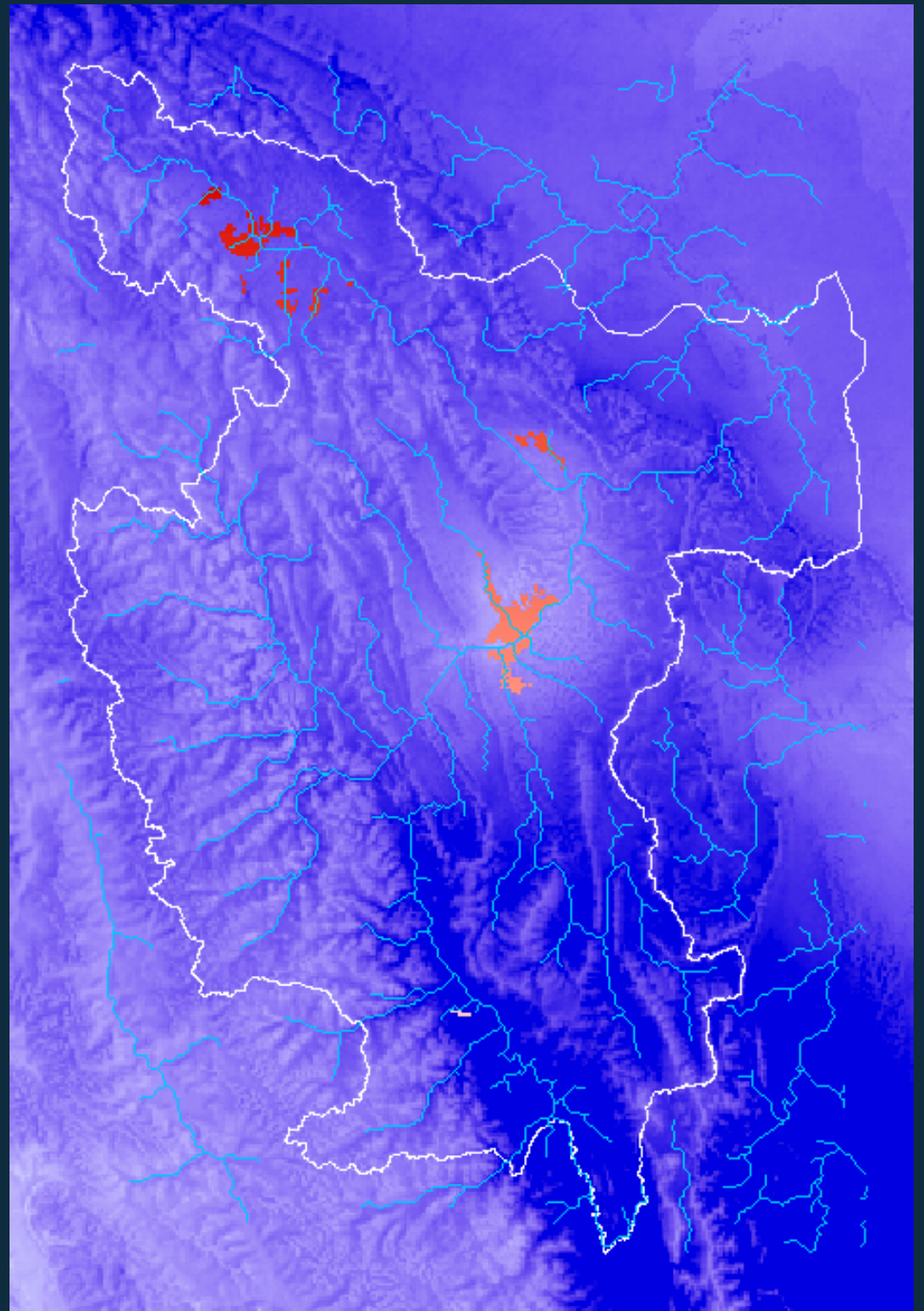
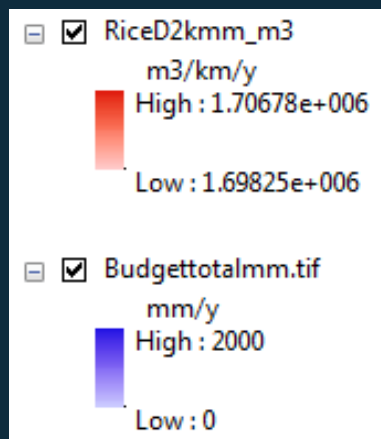
Capacity: Water balance (WaterWorld)



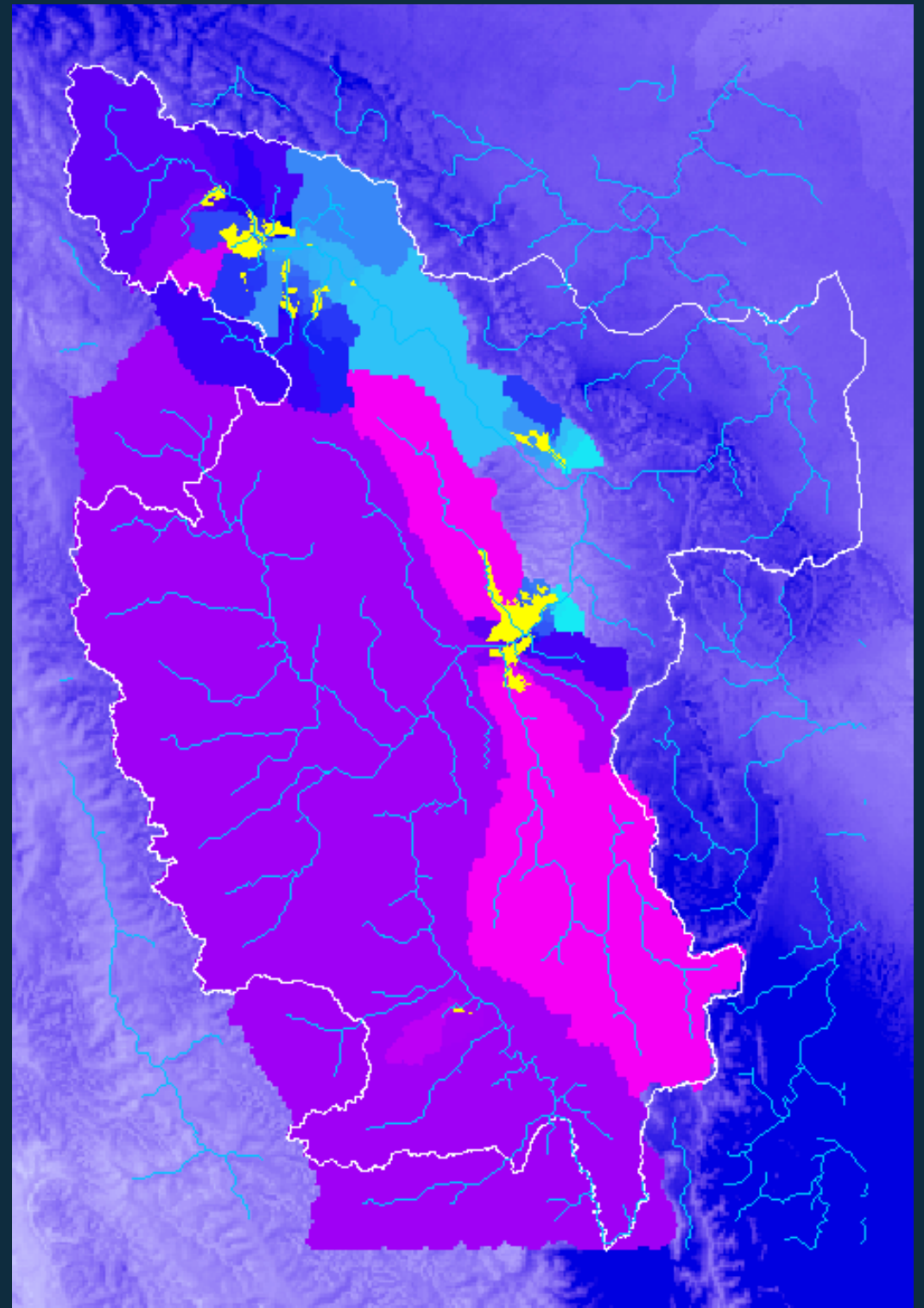
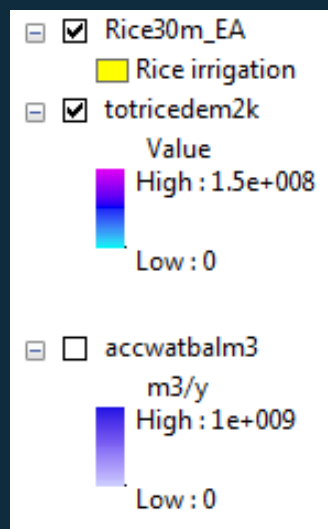
Condition: Rate of water yield



Beneficiaries: Areas of rice production

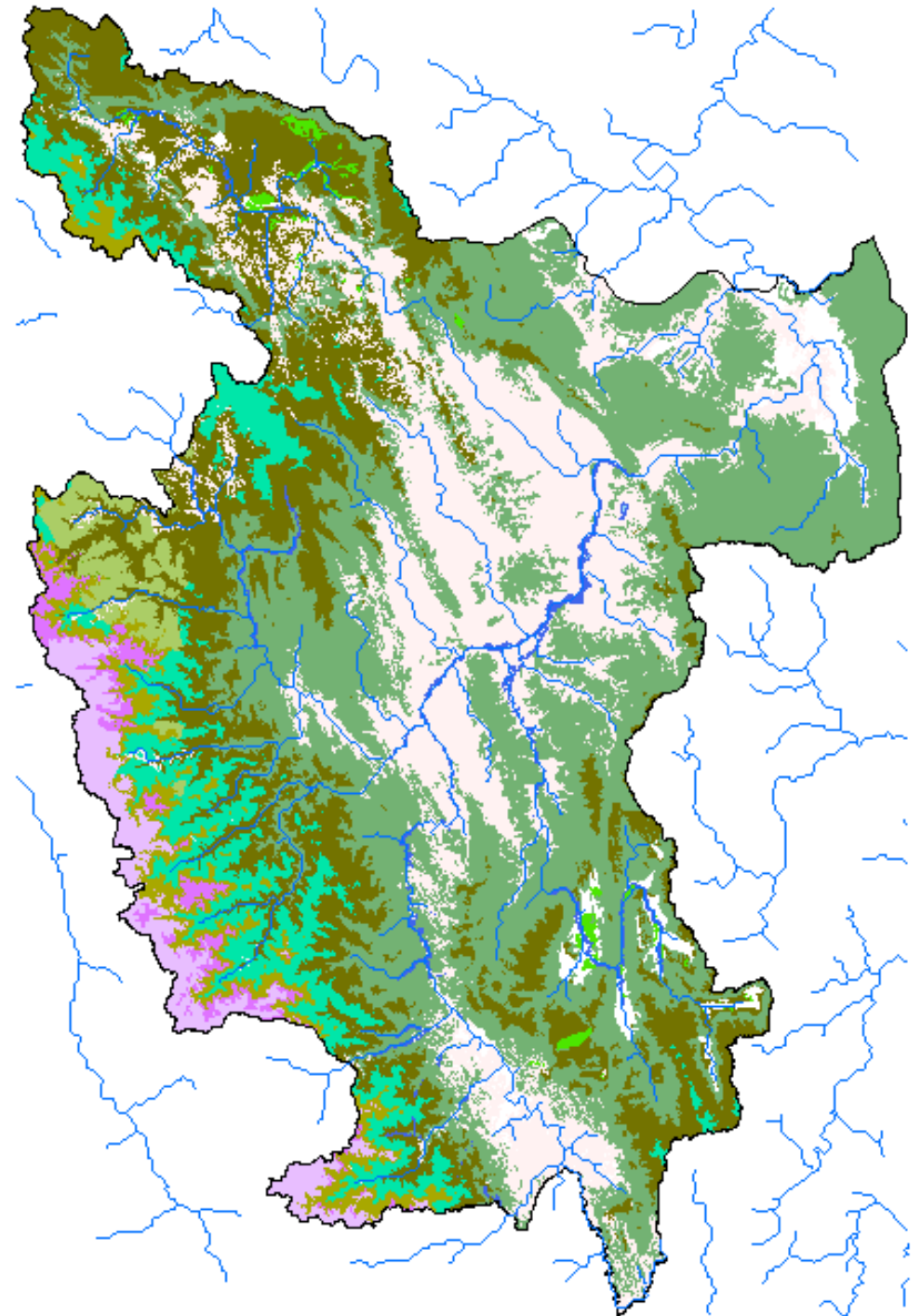


Service flow: Water demand by irrigated rice



Natural ecosystems in San Martín (Comunidad Andina)

- Sistemas_andinos_DD_afiche_C
- MACROGRUPO
- AMAZONIA
 - Arbustal montano xerofítico de Yungas
 - Áreas intervenidas
 - Bosque altimontano y altoandino húmedo de Yungas
 - Bosque húmedo de las Cordilleras Subandinas Orientales
 - Bosque montano húmedo de Yungas
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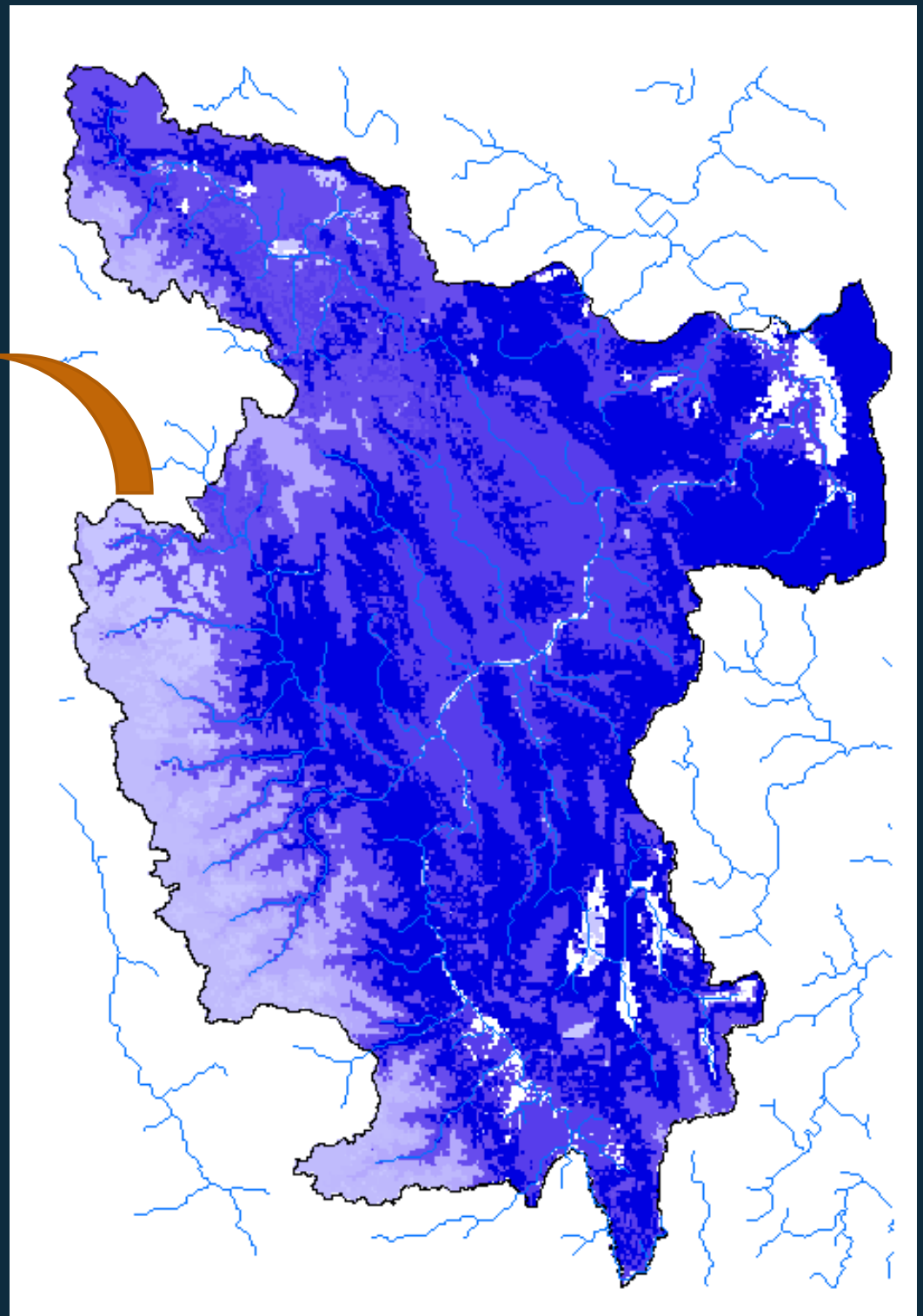
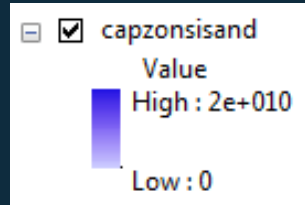


Capacity:
Sum of available
water per ecosystem



Table 2.2 Physical flows of ecosystem services for an EAU

Type of ecosystem services (by CICES)	Type of LCEU									
	Ag	Urban	Forest	Wetlands	...					
Provisioning services										
Regulating services										
Cultural services										

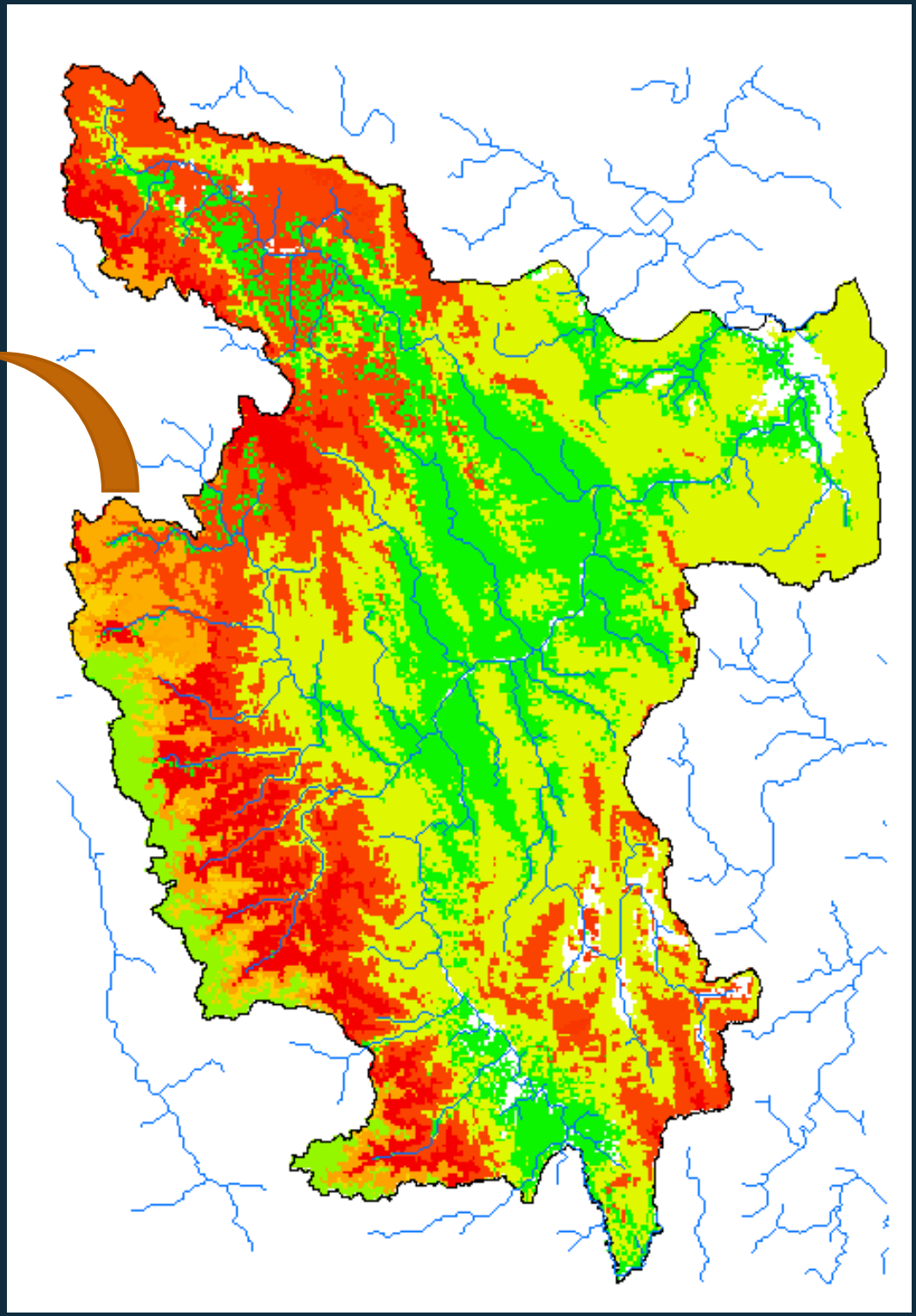
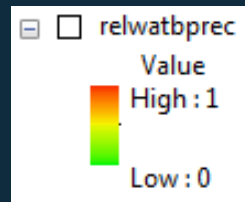


Condition: Mean water yield rate per ecosystem



Table 2.3 Measures of ecosystem condition and extent for an EAU at end of accounting period

Ecosystem extent	Characteristics of ecosystem condition					
	Vegetation	Biodiversity	Soil	Water	Carbon	
Area (proportion of EAU)	Indicators (e.g. Leaf area index, biomass index)	Indicators (e.g. species richness, relative abundance)	Indicators (e.g. soil fertility, soil carbon, soil moisture)	Indicators (e.g. river flow, water quality, fish species)	Indicators (e.g. net carbon balance, primary productivity)	
Type of LCEU						
Forests						
Agricultural land						
Urban areas						
Inland water bodies						



Flow: Mean of total demand per ecosystem

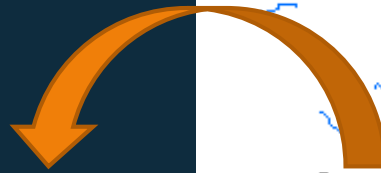


Table 2.4 Expected ecosystem service flows at end of accounting period

Type of ecosystem services (by CICES)	Expected ecosystem service flows per year			
	Forests	Agricultural land	Inland water bodies	...
Provisioning services				
Regulating services				
Cultural services				

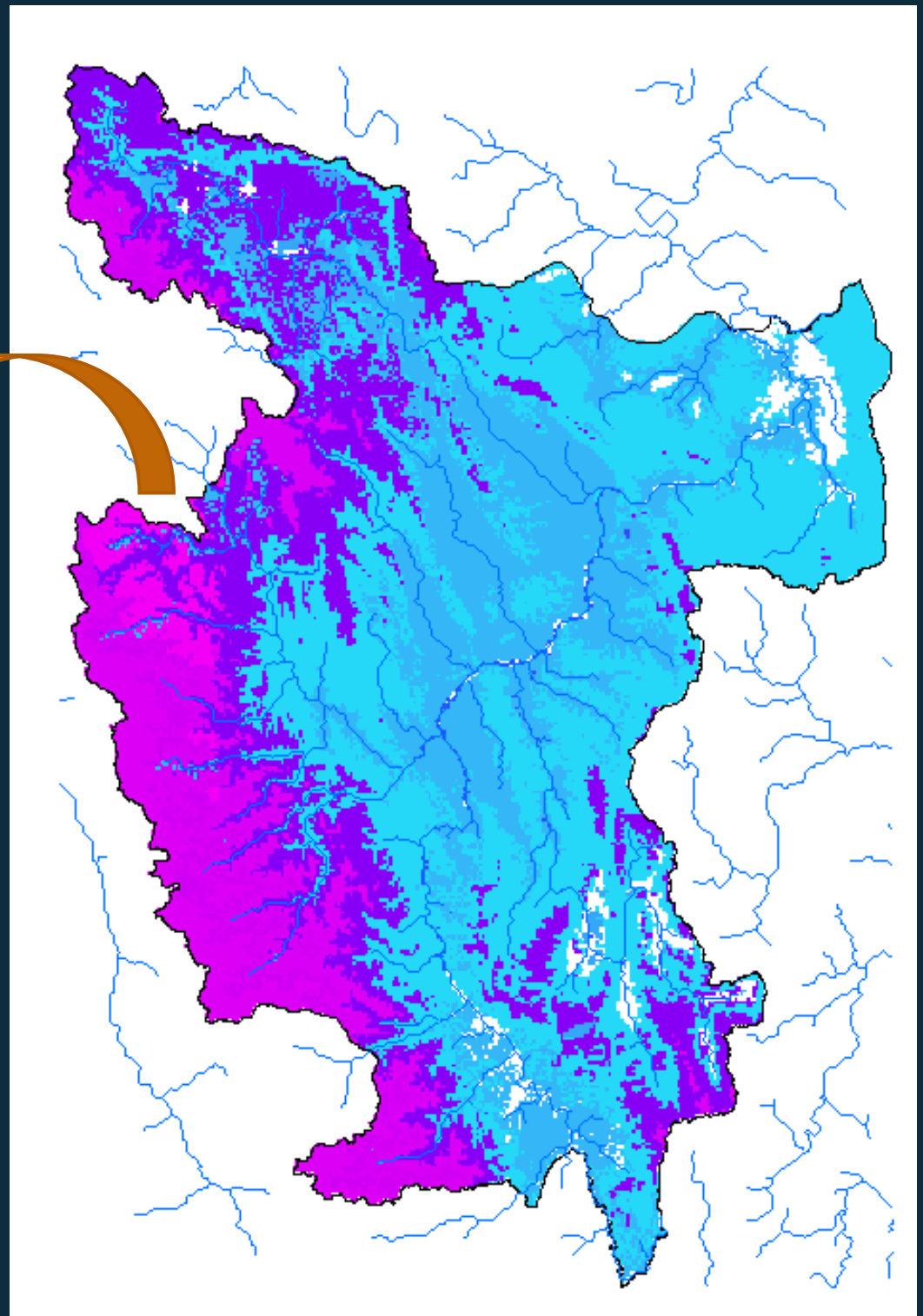
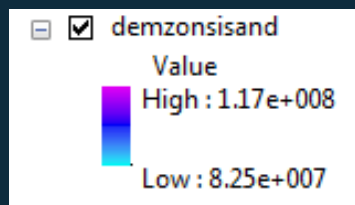
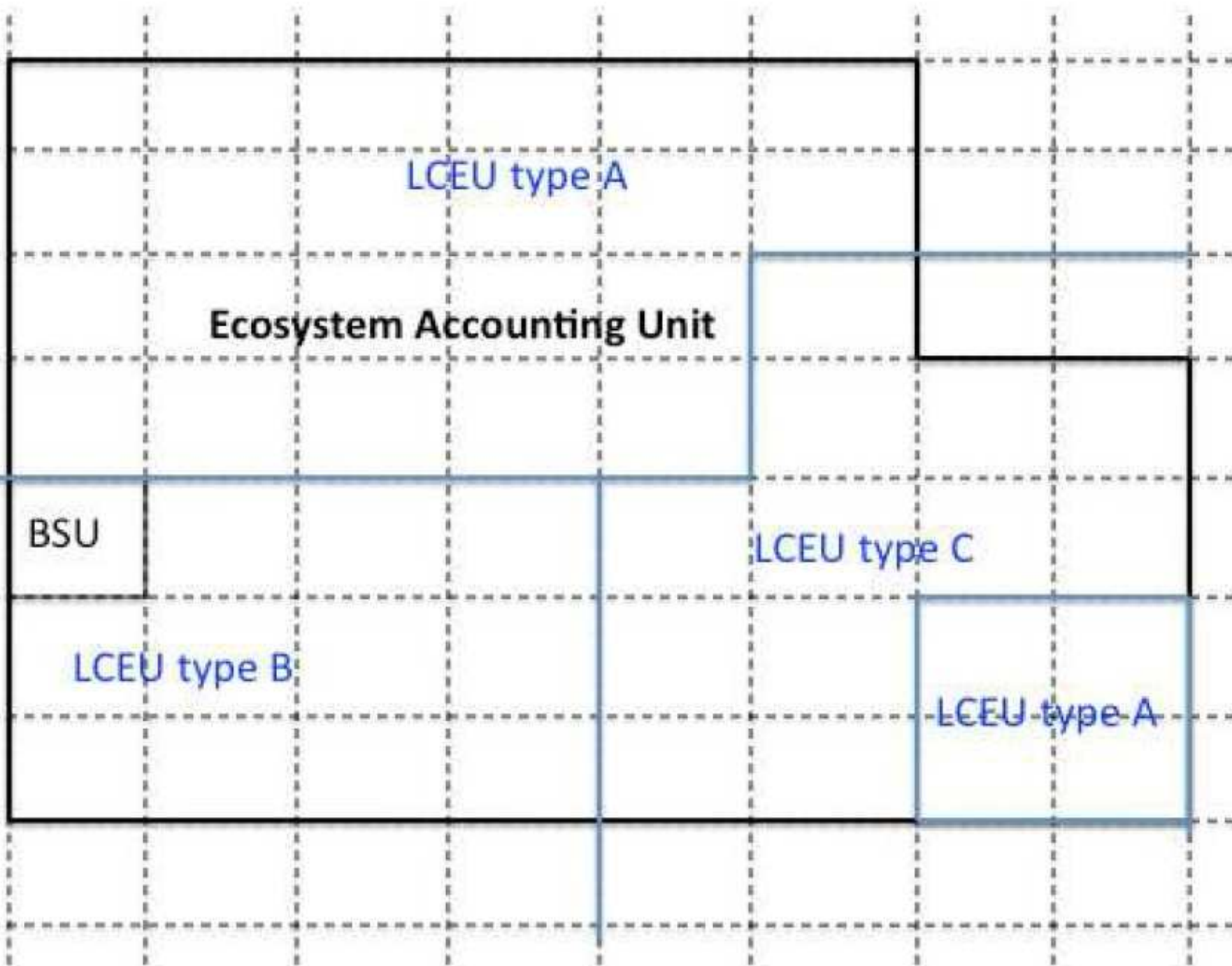


Figure 2.4 Stylised depiction of relationships between EAU, BSU and LCEU



EAU: Hydrological units (ANA)

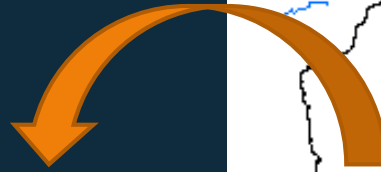
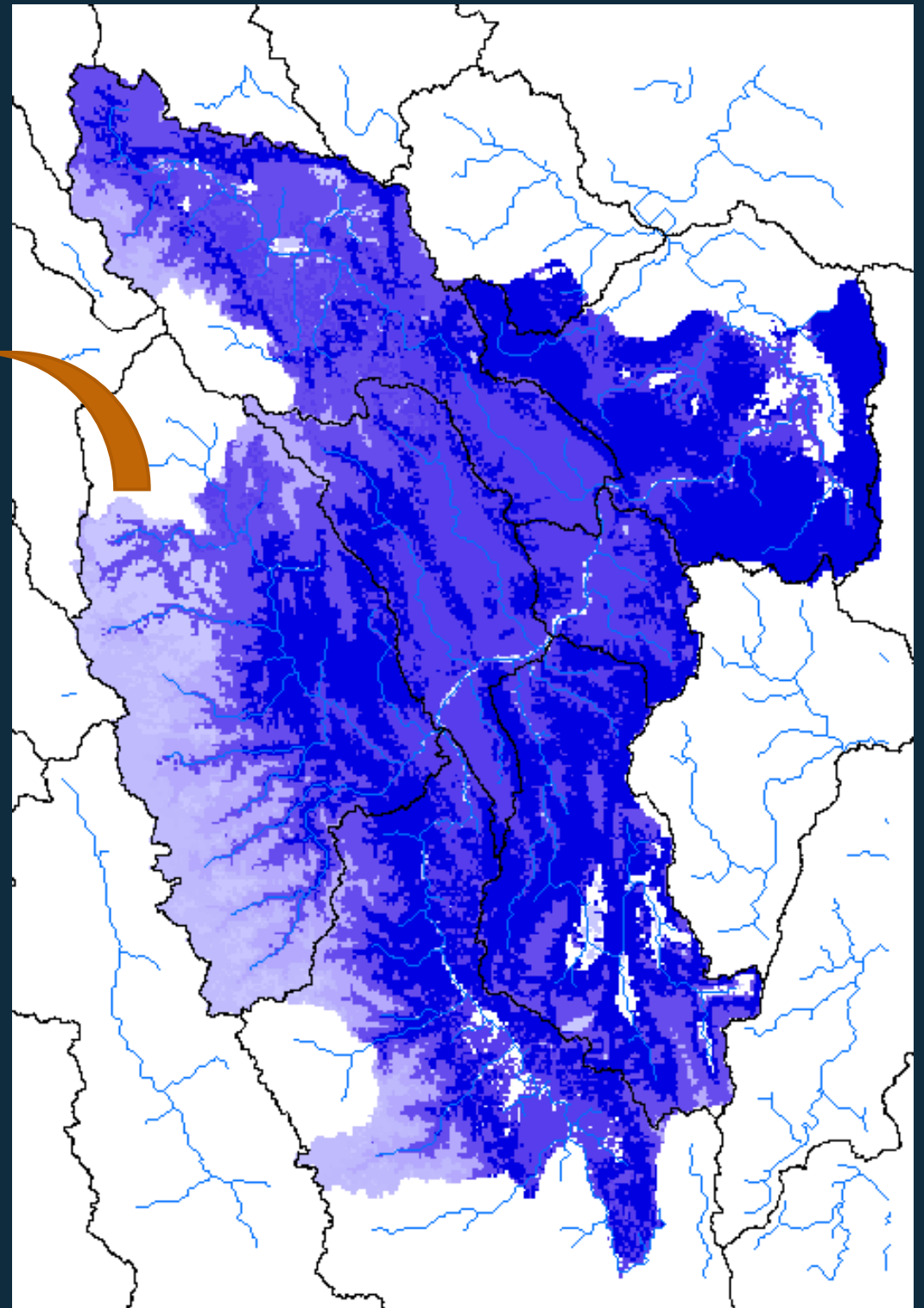
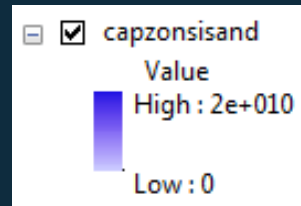


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Provisioning services										
Regulating services										
Cultural services										



EAU: District boundaries (Gov. of San Martin)

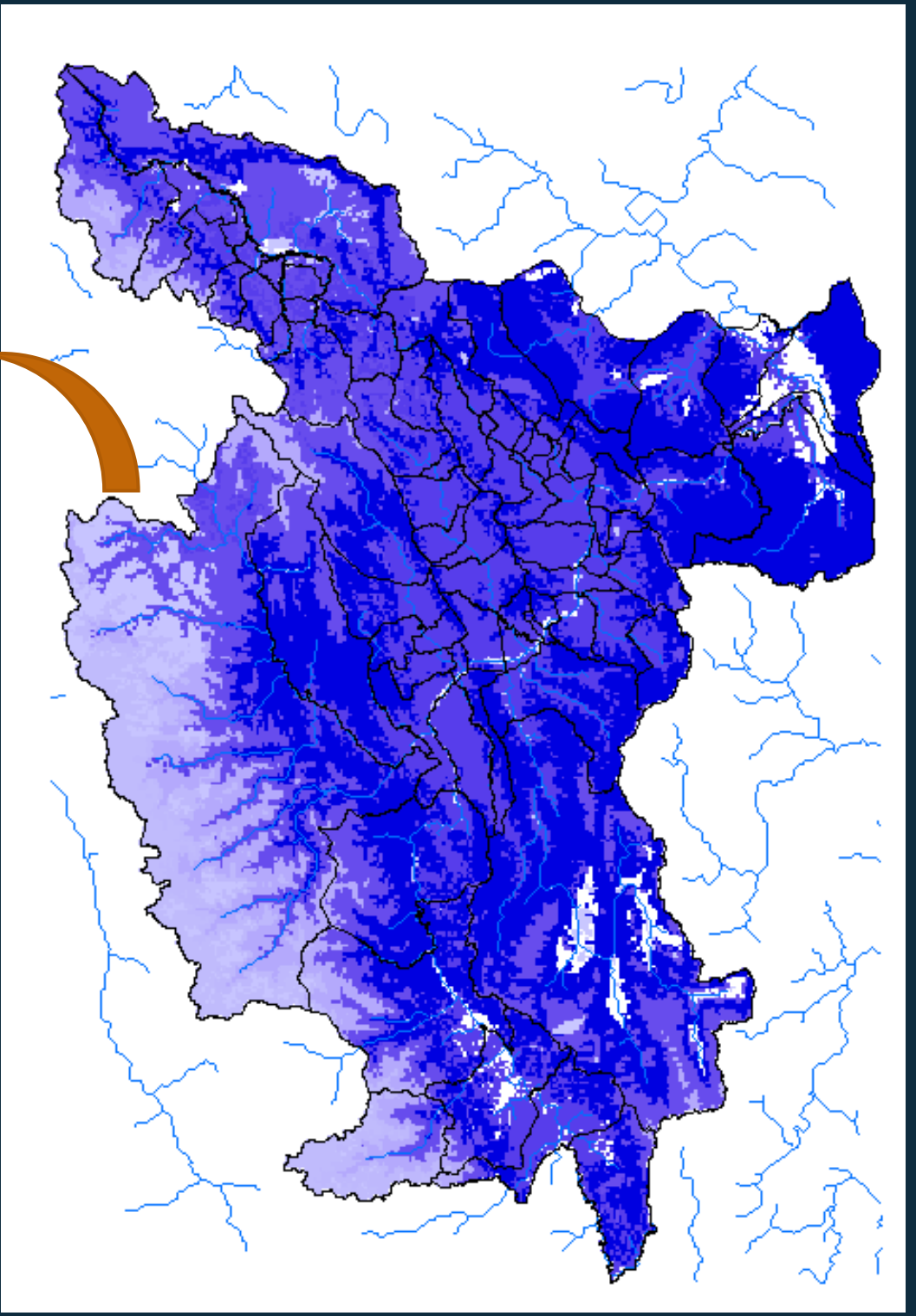


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Type of ecosystem services (by CICES)	Type of LCEU											
	Ag	Urban	Forest	Wetlands	...							
Provisioning services												
Regulating services												
Cultural services												

capzonsisand
 Value
 High : 2e+010
 Low : 0



**ECOSYSTEM VALUES
ASSESSMENT &
ACCOUNTING (EVA)**

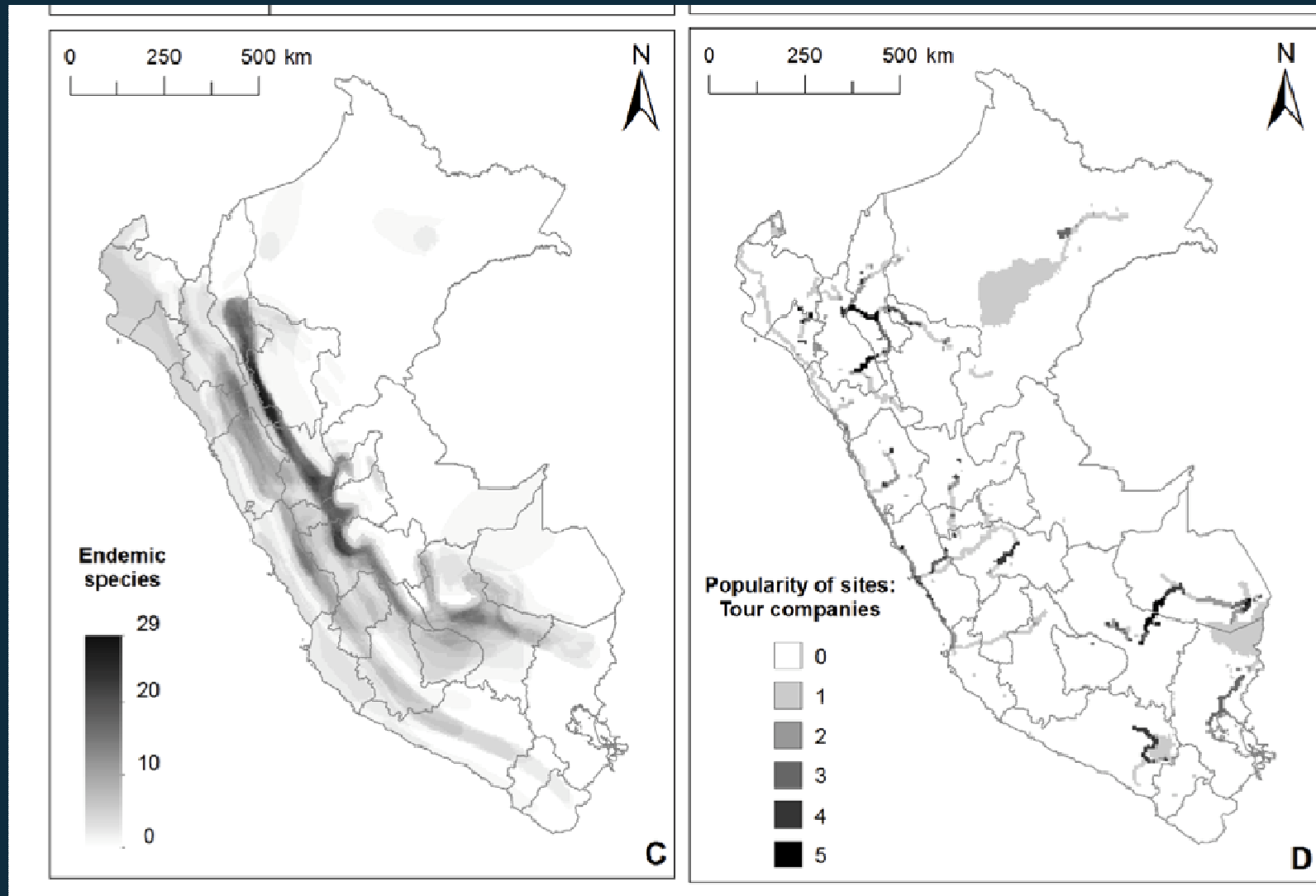
**ACCOUNTING FOR
BIODIVERSITY
(PRELIMINARY APPROACH)**

ACCOUNTING FOR BIODIVERSITY

There are broadly at least 5 ways biodiversity can be considered in accounts:

1. An environmental asset
2. Environmental Protection Expenditure Accounts
3. An indicator of ecosystem condition
4. An ecosystem service
5. An input into economic production

Biodiversity as an ecosystem service



Source: Puhakka, L., Salo, M., Sääksjärvi, I.E. (2011) Bird Diversity, Birdwatching, Tourism And Conservation in Peru. A Geographic Analysis. PLoS One 6(11) e26786

Thanks!

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INTERNATIONAL



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<http://conservation.org>