

A vibrant landscape photograph featuring a dense forest of tall, thin trees in various shades of green. In the foreground, a calm body of water reflects the sky and the surrounding greenery. The overall scene is bright and clear, suggesting a healthy, natural environment.


Biodiversity and conservation in China: Challenge and Opportunity

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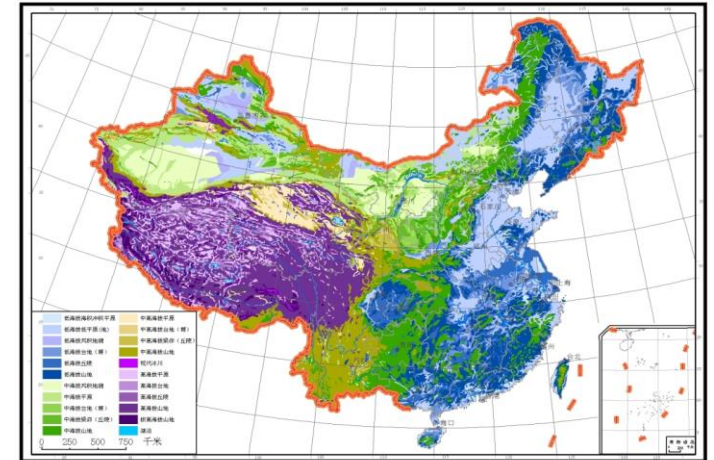
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- ◆ A brief view of biodiversity in China
 - ◆ Hotspots for biodiversity conservation
 - ◆ Protected areas and biodiversity conservation
 - ◆ Linking biodiversity and ecosystem services to policy making



A brief view of biodiversity in China

China is one of the mega-country in biodiversity

- ✧ China is a vast country with extremely various of climate and geographic combinations.
 - ✓ From southern China to northern China: tropical zone to cold zone
 - ✓ From eastern China to western China: humidity region to arid region
- ✧ There developed and preserved almost all kinds of ecosystems on the earth in China.
 - ✓ Forests, grasslands, wetland, alpine ecosystems, marine, cropland, urban,
 - ✓ Providing various habitat for wildlife
- ✧ China is one of the mega-country in biodiversity in the world.



Plants

- ✧ The number of spermatophytes is only after Brazil and Columbia
- ✧ Woody plant species: 8,000, about 40% of total tree species of world.

	No. Species	Percentage of the world (%)	No. Families	Percentage of the world (%)
Tundra	2200	9.1	106	70
Ferns	2200~2600	22	52	80
Gymnosperms	250	29.4	10	66
Angiosperms	> 30000	10	328	75

Animals

	No. of Species	Percentage of the world (%)	Endemic Species	Percentage of total species of China(%)
Vertebrates	>7500	14.03	667	~10
Birds	1339	13.26	69	5
Fish	>3900	13.74	440	11
Mammals	>670	15.1	73	12
Reptiles	>400	6.5	26	6
Amphibian	>300	7	30	10

Ecosystems

In China, there are developed and preserved almost all kinds of ecosystems on the earth.

Forest ecosystems	343
Grassland and meadow ecosystems	122
Desert ecosystems	49
Wetland ecosystems	145
Alpine tundra ecosystems	15
Total	674



Hotspots for biodiversity conservation

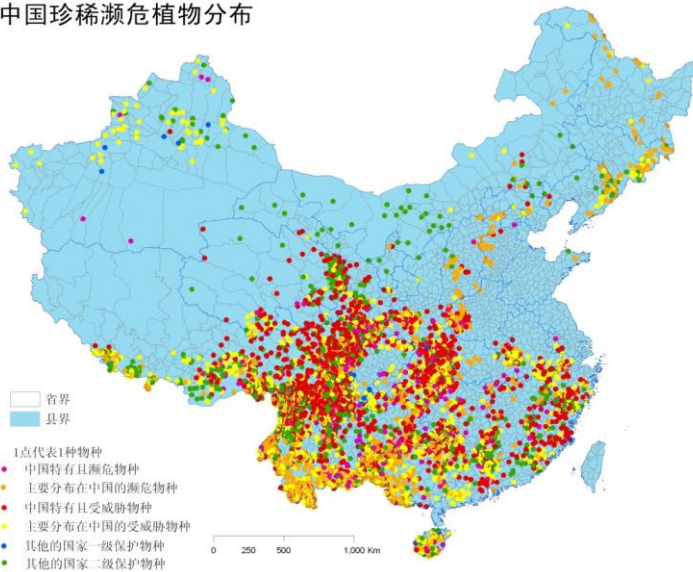


Distribution of all selected plant species

中国特有且濒危的植物分布



中国珍稀濒危植物分布



主要分布在中国的濒危植物分布



主要分布在中国的濒危植物分布



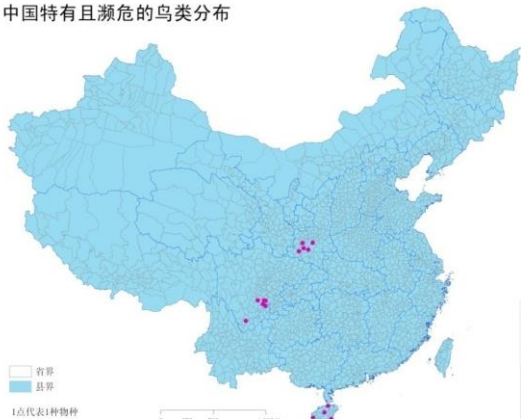
其他的国家二级保护植物分布





Distribution of all selected bird species

中国特有且濒危的鸟类分布



主要分布在中国的濒危鸟类分布



中国珍稀濒危鸟类分布



中国特有且受威胁的鸟类分布



其他的国家二级保护鸟类分布





Distribution of all selected mammal species

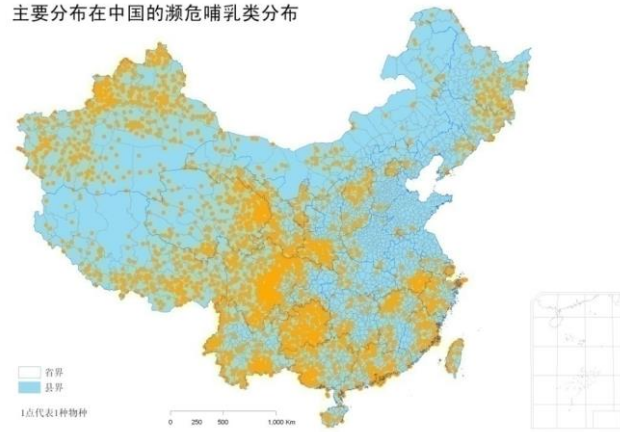
中国特有且濒危的哺乳类分布



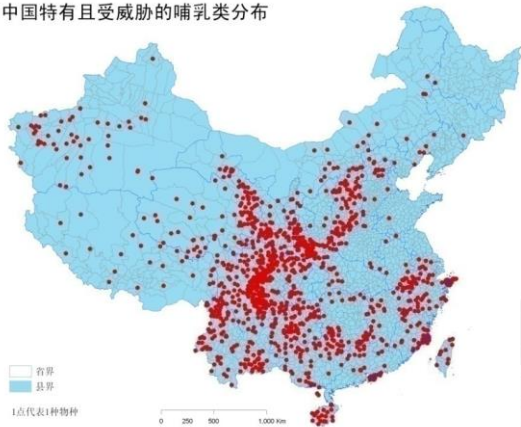
中国珍稀濒危哺乳类分布



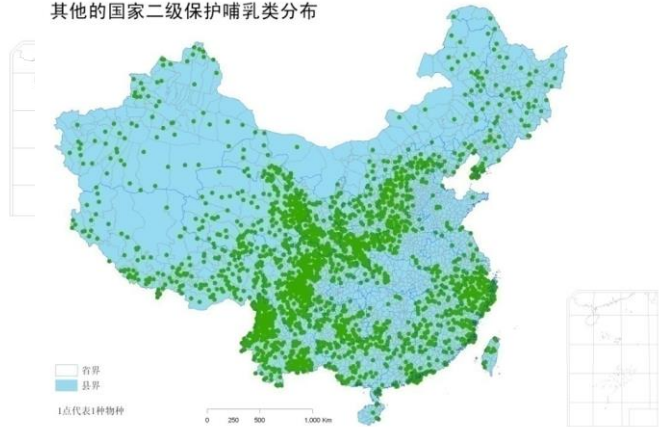
主要分布在中国的濒危哺乳类分布



中国特有且受威胁的哺乳类分布



其他的国家二级保护哺乳类分布



- 省界
- 县界
- 1点代表3种物种
- 中国特有且濒危物种
- 主要分布在中国的濒危物种
- 中国特有且受威胁物种
- 主要分布在中国的受威胁物种
- 其他的国家一级保护物种
- 其他的国家二级保护物种



Distribution of all selected amphibian species

中国特有且濒危的两栖类分布



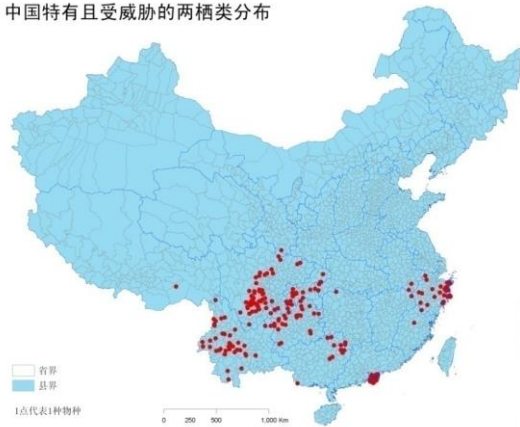
中国珍稀濒危两栖类分布



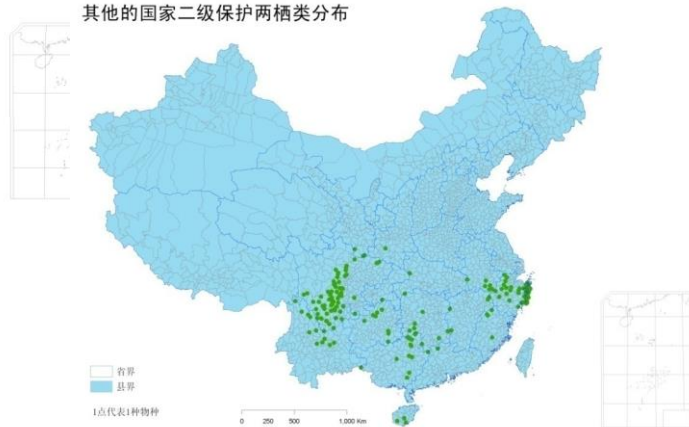
主要分布在中国的濒危两栖类分布



中国特有且受威胁的两栖类分布



其他的国家二级保护两栖类分布





Distribution of all selected reptile species

中国特有且濒危的爬行类分布



主要分布在中国的濒危爬行类分布



中国珍稀濒危爬行类分布



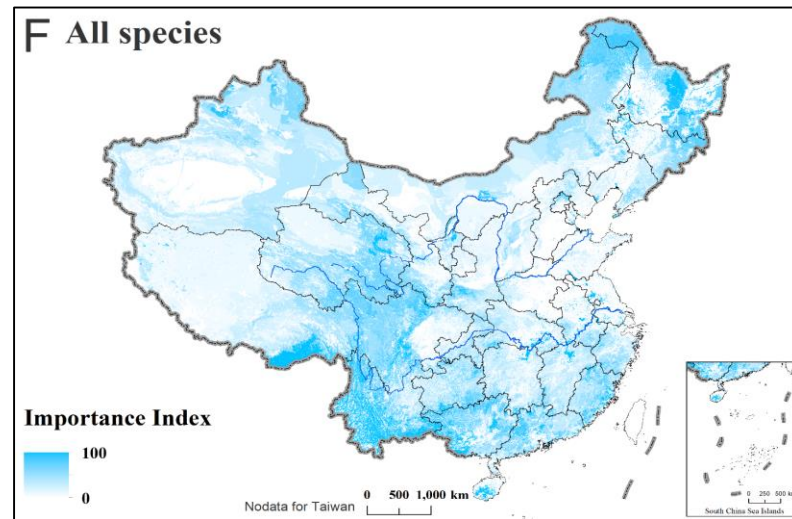
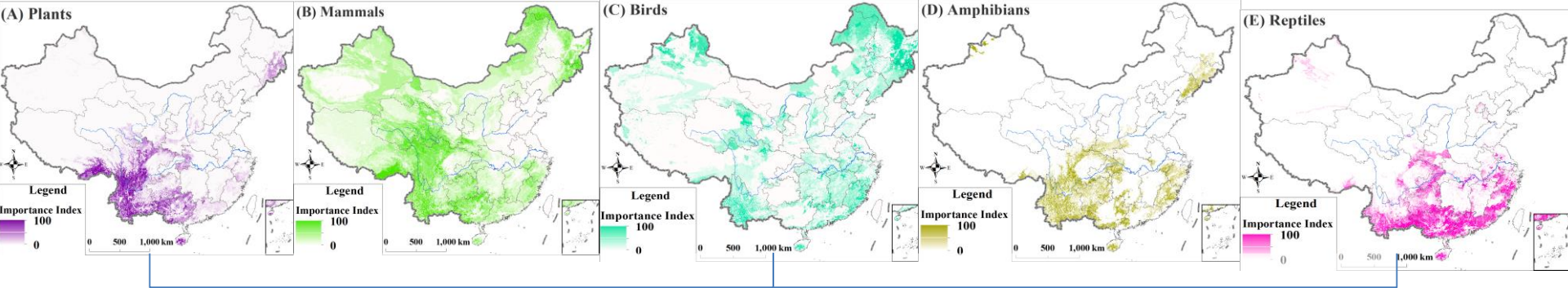
其他的国家二级保护爬行类分布



中国特有且受威胁的爬行类分布



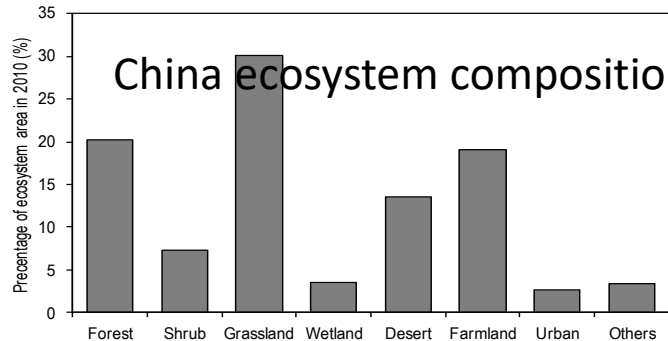
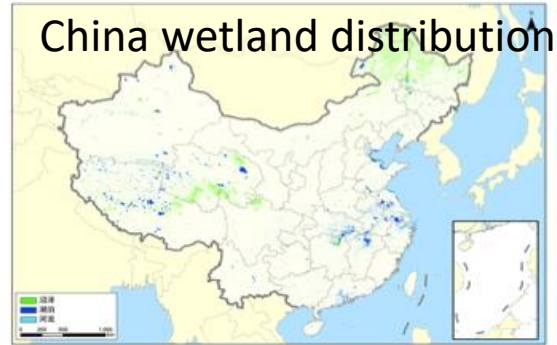
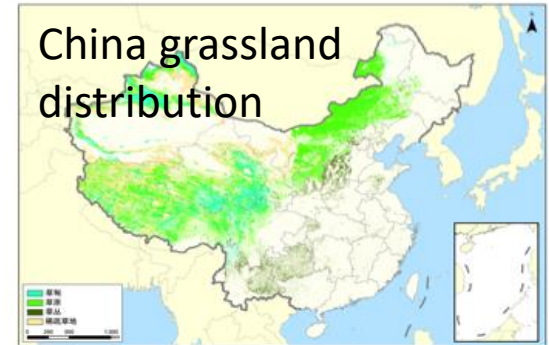
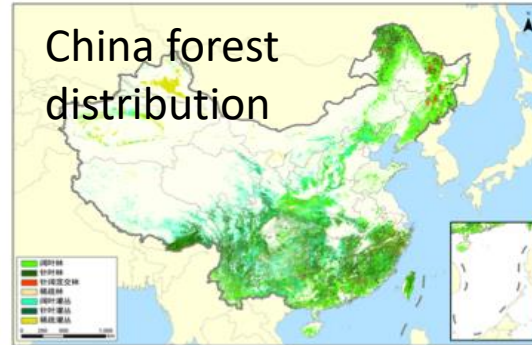
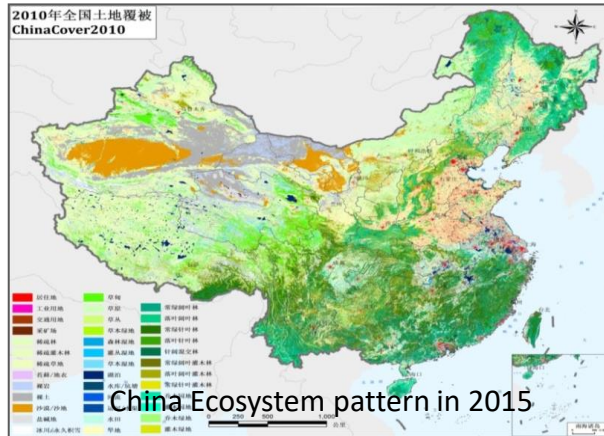
Habitat importance index of all selected species





Ecosystem status and services

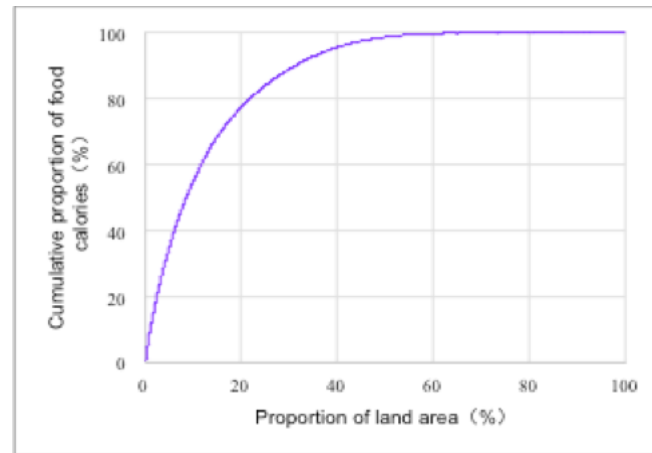
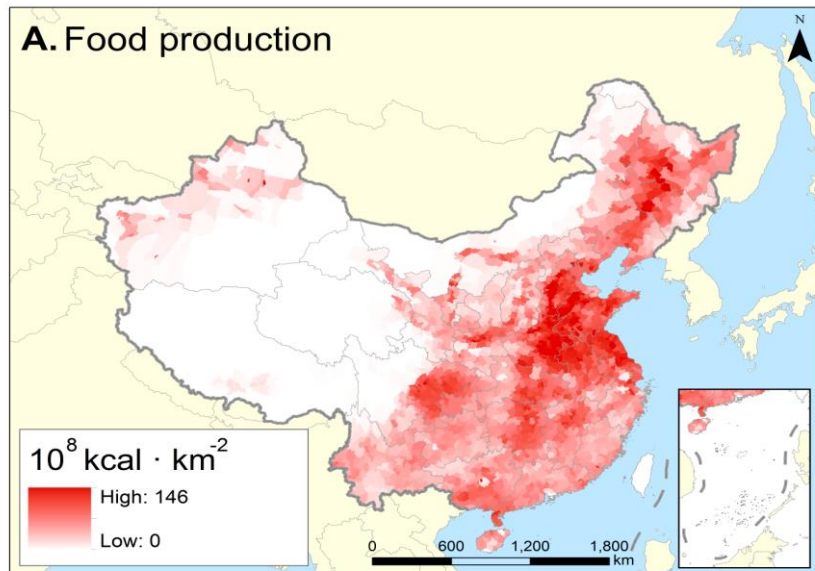
China ecosystem composition and patterns



Grassland, forest, cropland and desert were made of 82.8% of total area of China

Ecosystem services

Food production

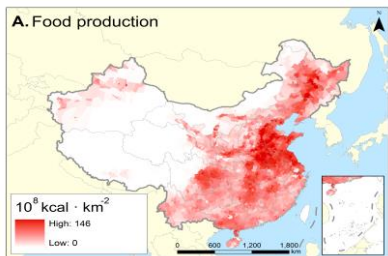


The curve showed that 18.5% land provided 75% food of China

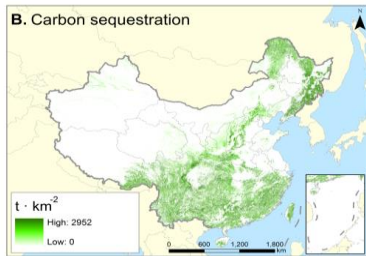
Importance of food production	Area □ 10^4 km^2 □	Area proportion □ % □
Very high	80.86	8.54
High	94.71	10.01
Medium	121.74	12.86
Normal	649.25	68.59

Ecosystem services

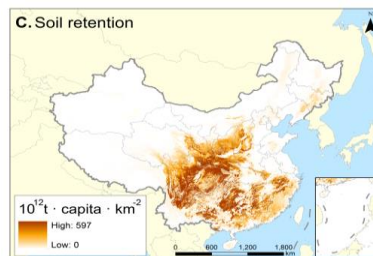
Identify crucial areas of ecosystem services in China



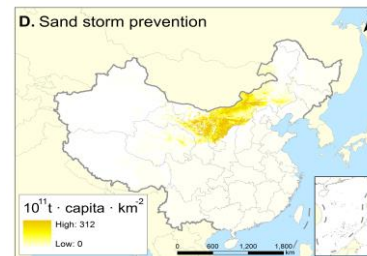
Food production



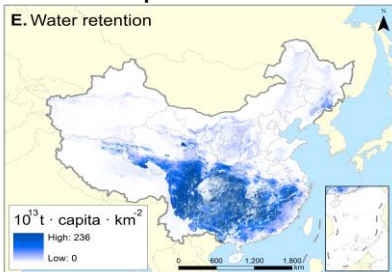
Carbon sequestration



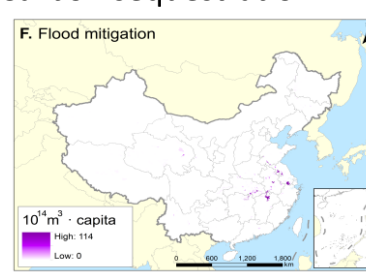
Soil retention



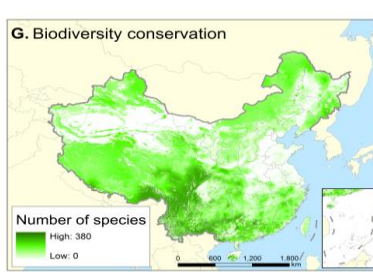
Sand storm prevention



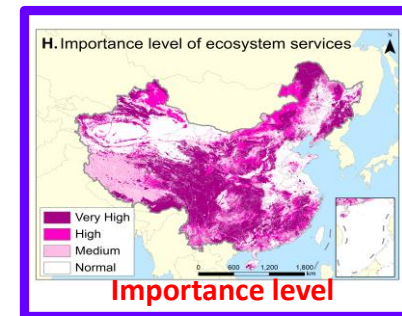
Water retention



Flood mitigation



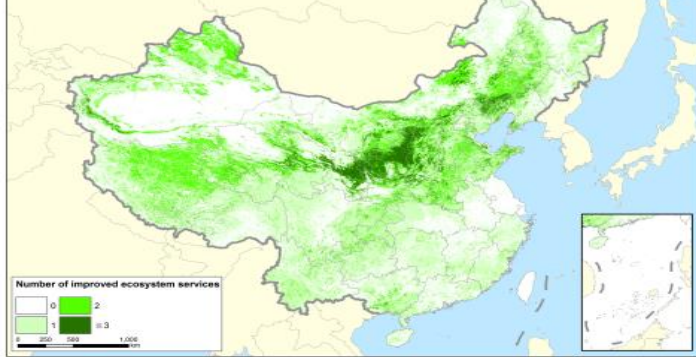
Biodiversity conservation



We translated biophysical supply of ecosystem services into importance of service provision by weighting supply by the number of people affected.

Changes of ecosystem service pattern

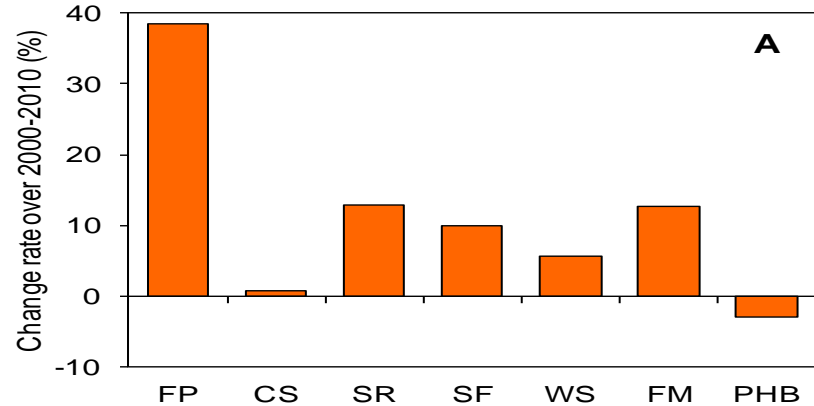
A. Spatial pattern of ecosystem service improved ▲



B. Spatial pattern of ecosystem service decreased ▲



All ecosystem services evaluated increased since 2000, with the sole exception of habitat provision for biodiversity.



FP: Food production, CS: Carbon sequestration, SR: Soil retention, SF: Sand fixation, WS: Water supply, FM: Flood mitigation, PHB: provision of habitat for biodiversity.



Protected areas and biodiversity conservation

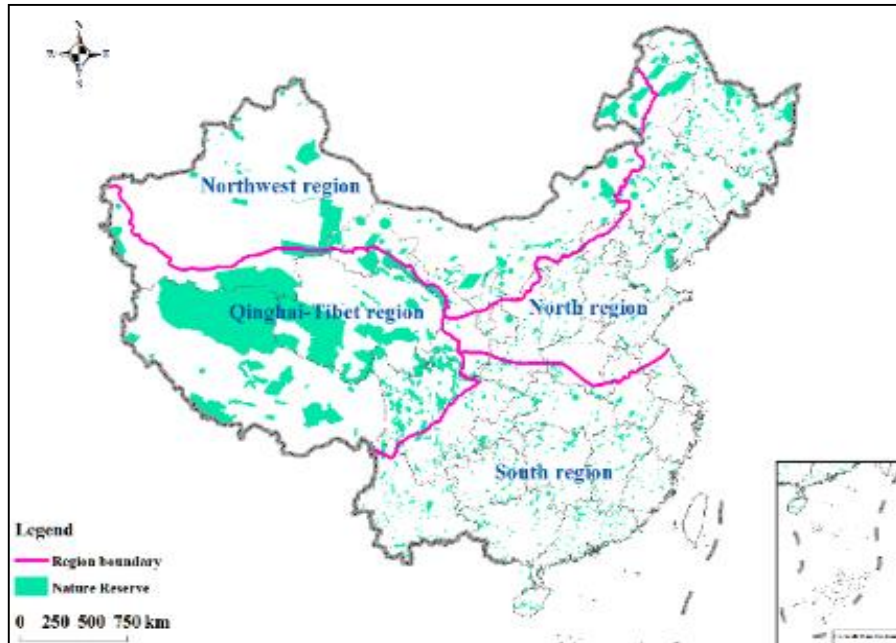


Protected areas in China

Types of PAs	Total number	National	Local
Natural reserves	2729	428	2306
Forest parks	2747	791	2000
Wetland parks	569	569	—
Scenic spot	962	225	737
Geological parks	319	240	101
National water parks	658	520	119
Aquatic spam resource reserves	464	464	
Others (water, cultural forests)			
	8448	3238	5263

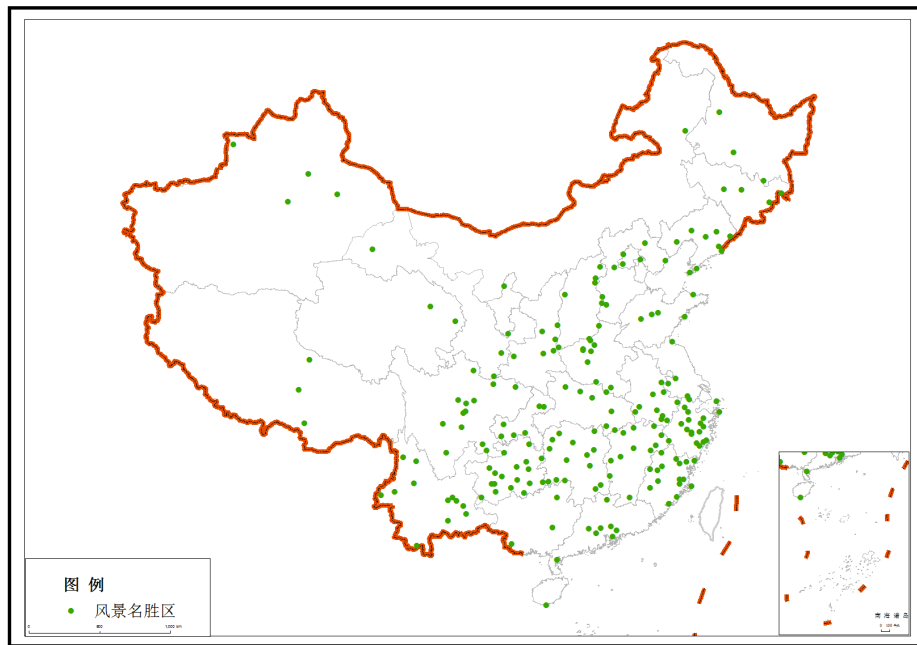
自然保护区/Natural reserves

- Total number: 2729, Area: 1.498 million km²



风景名胜区/Scenic spot

- Total number: 963, Area: 0.197 million km²



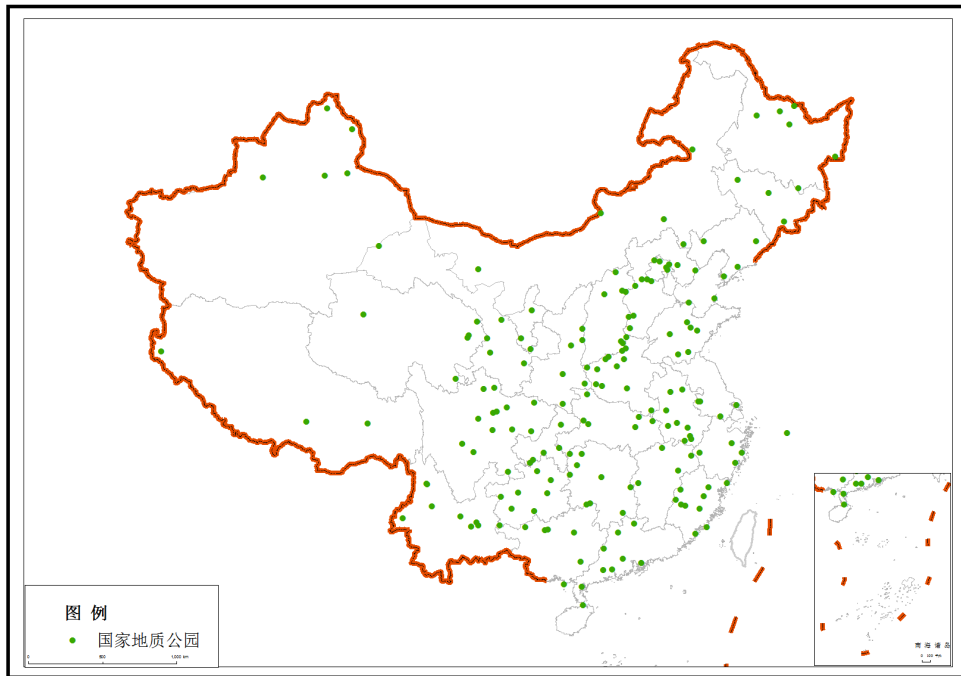
森林公园/Forest parks

- Total number: 2747, Area: 0.17 million km²

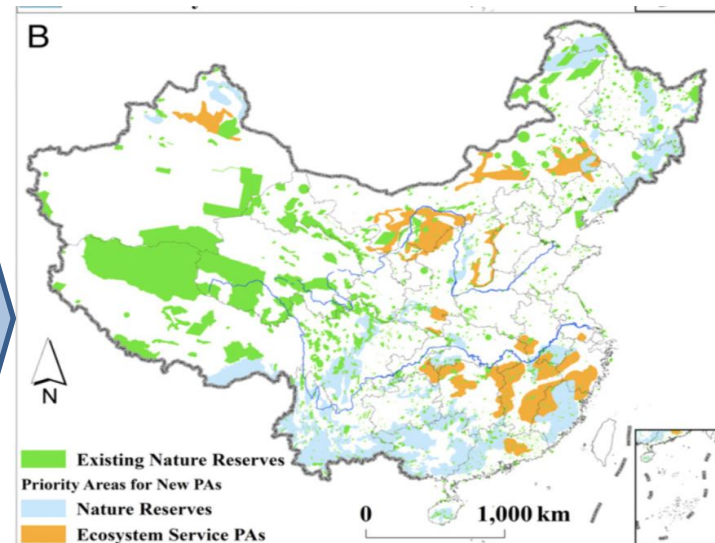
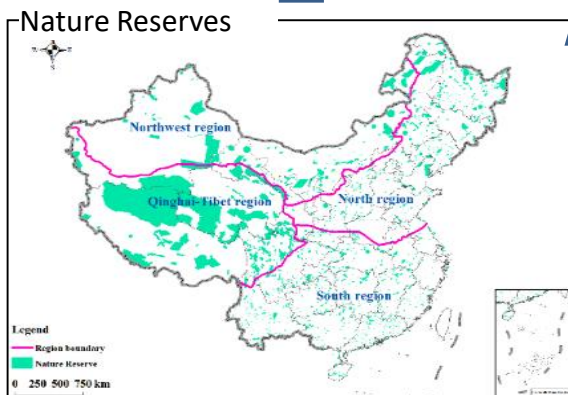
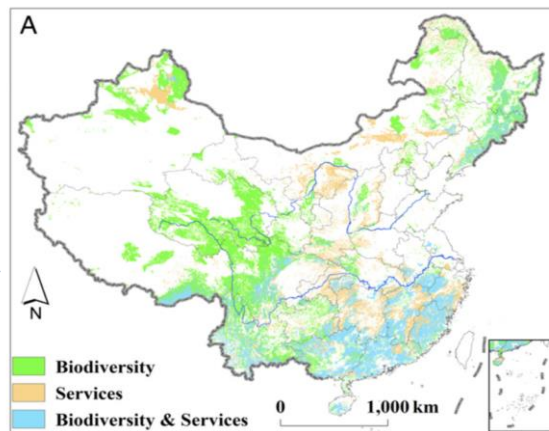
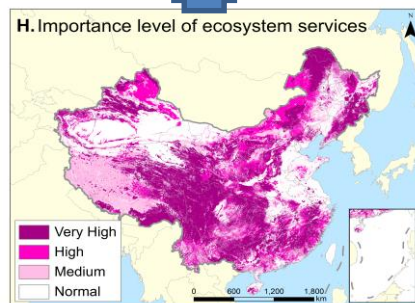
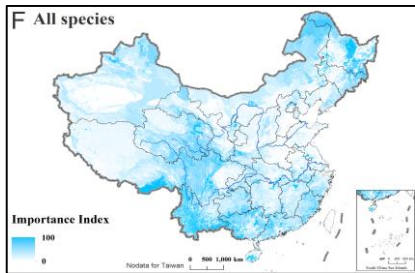


地质公园 / Geological parks

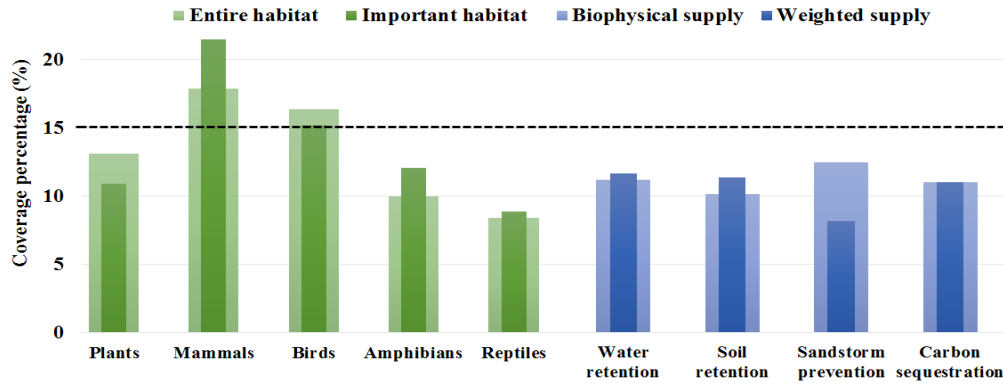
- Total number: 218, Area: 0.086 million km²



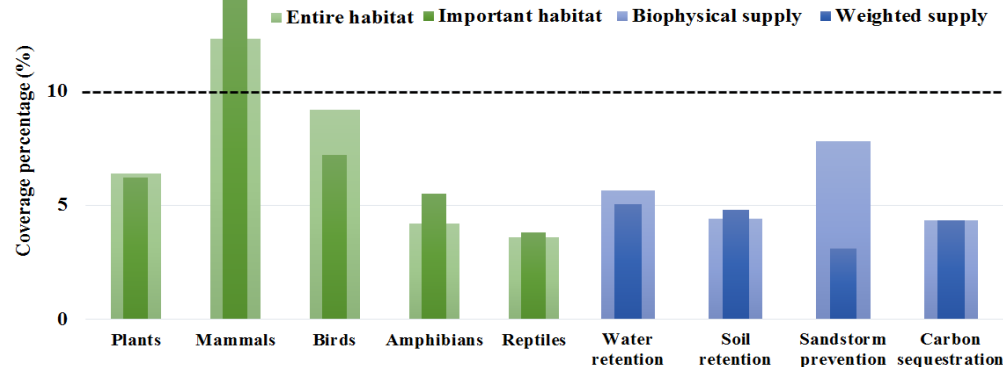
Protection of biodiversity and Ecosystem services



All natural reserves



National natural reserves



China's nature reserve network currently represents the habitat for :

- Plants, 13.1%,
- Mammals, 17.9%,
- Birds, 16.4%,
- Amphibians 10.0%, and
- Reptiles, 8.4%

China's nature reserve network contributes only

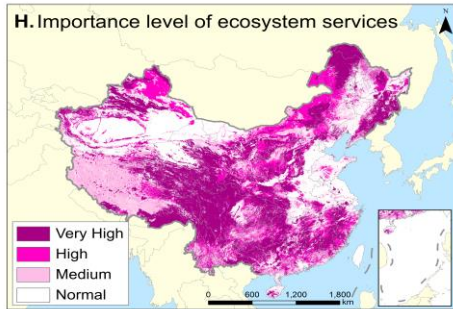
- 11.2% of water retention,
- 10.2% of soil retention,
- 12.5% of sandstorm prevention
- 11.0% of carbon sequestration.



Linking biodiversity and ecosystem services to policy making

Linking biodiversity and ES to policy making

Identify crucial areas of ecosystem services in China

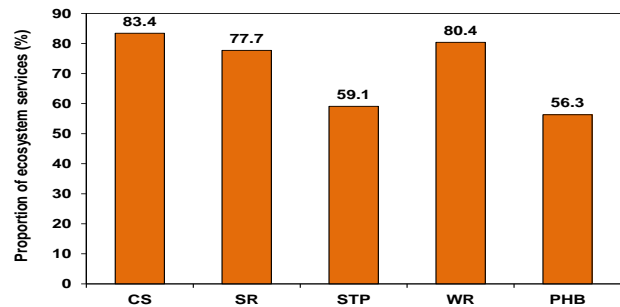
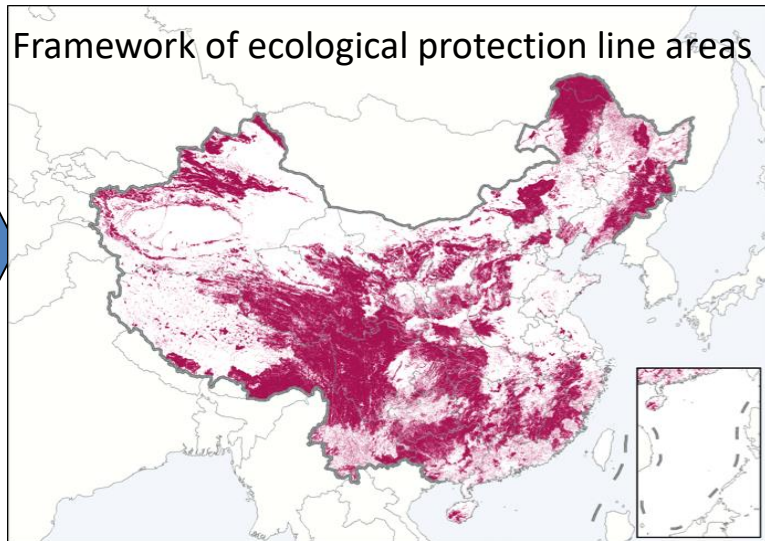
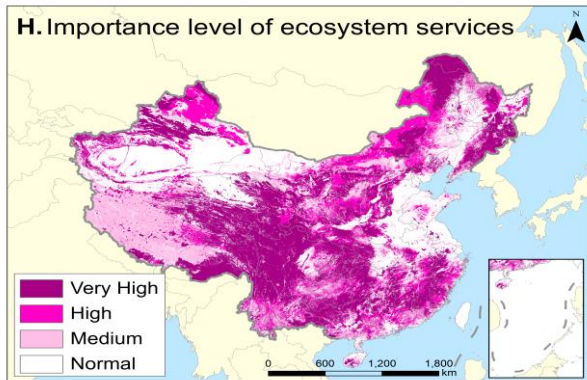


Importance	Land area		Soil retention	Water retention	Sand storm prevention	Biodiversity conservation
	10 ⁴ km ²	%	%	%	%	%
Very high	343.6	35.8	66.3	60.8	37.3	51.8
High	204.6	21.3	22.0	21.8	27.0	24.1
Medium	161.2	16.8	9.1	11.9	19.2	19.2
Normal	246.8	25.7	2.5	5.4	16.5	4.9

✧ The table showed that about 35% land with high level of ecological importance provide about 60% of ecosystem regulating services.

Linking biodiversity and ES to policy making

Ecological Protection Redline



Provision of ecosystem services in
EPR Areas (35 %)

- ✦ The very high important areas are planned as Ecological Protection Redline (EPR) to protected strictly for providing ecosystem services and wildlife habitat
- ✦ EPR: 35 % of China

环境保护部办公厅
国家发展和改革委员会办公厅 文件

环生态[2017]48号

关于印发《生态保护红线划定指南》的通知

各省、自治区、直辖市环境保护厅(局)、发展改革委,新疆生产建设兵团环境保护局、发展改革委:

根据中共中央办公厅、国务院办公厅《关于划定并严守生态保护红线的若干意见》的安排部署,环境保护部、发展改革委共同组织编制了《生态保护红线划定指南》(见附件),现印发给你们。请按照本指南要求,加快推进本地区生态保护红线划定工作。

环境保护部联系人:张哲、张文国

电话:(010)66103047、66556309

传真:(010)66103049

国家发展改革委联系人:徐卫华

电话:(010)68501597

传真:(010)68501657

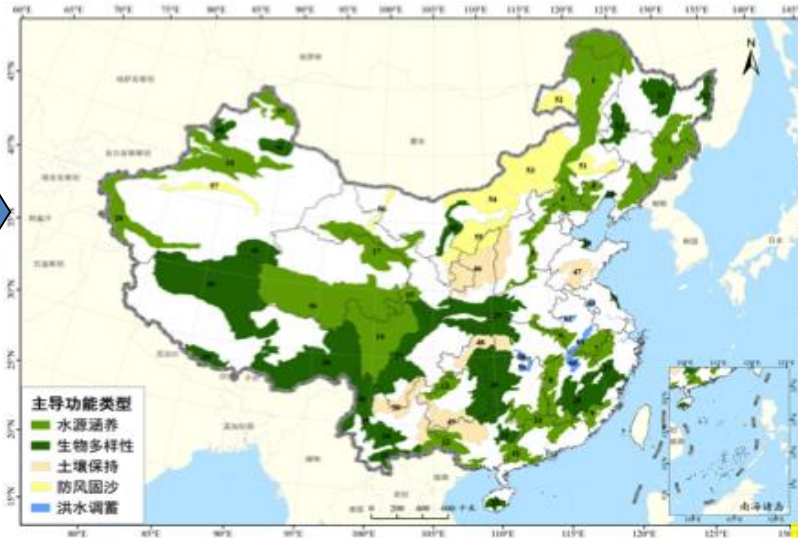
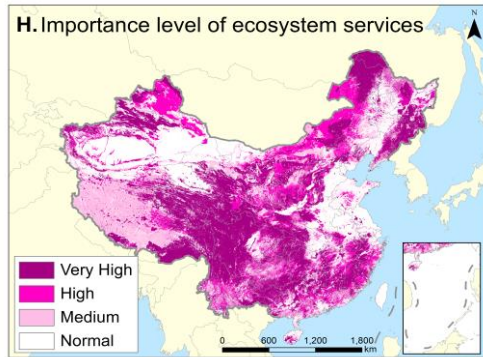
附件:生态保护红线划定指南



Guideline for
ecological redlining
by MEP and NDRC

Linking biodiversity and ES to policy making

Ecosystem function conservation areas



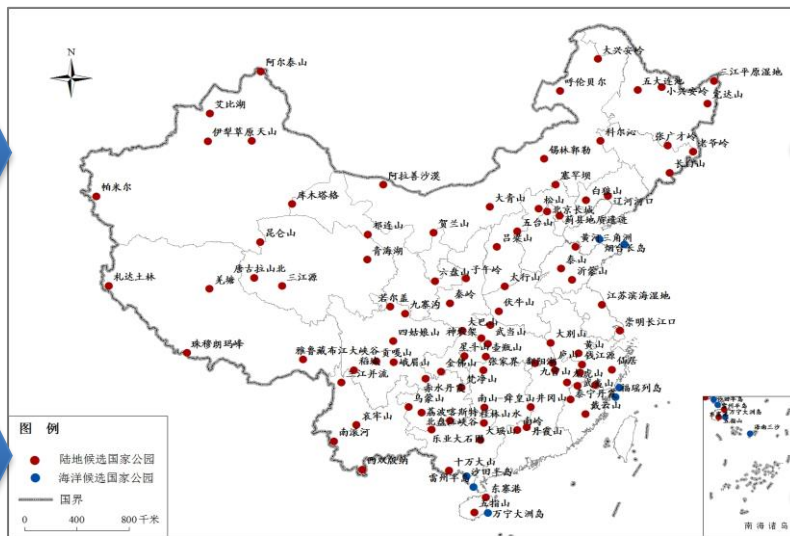
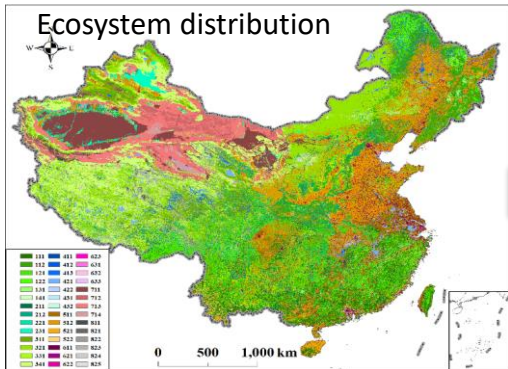
- ✦ 63 areas with critical ecosystem services were identified as **Ecosystem function conservation areas (EFCAs)** released in **2015** by MEP and CAS.
- ✦ Total 63 EFCAs, 49% of China.

- Water retention
- Biodiversity conservation
- Soil retention
- Sand fixation
- Flood mitigation

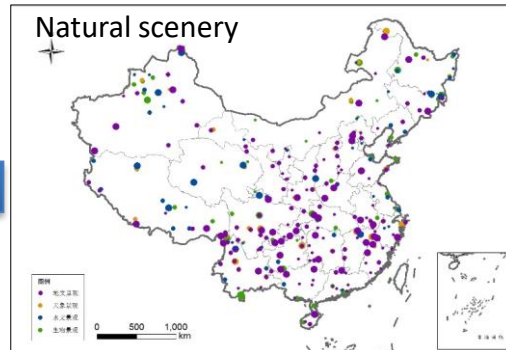
Linking biodiversity and ES to policy making

National park system planning

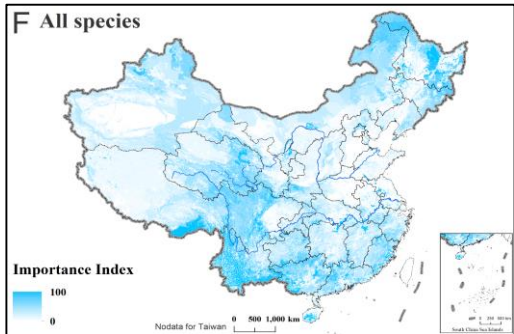
Ecosystem distribution



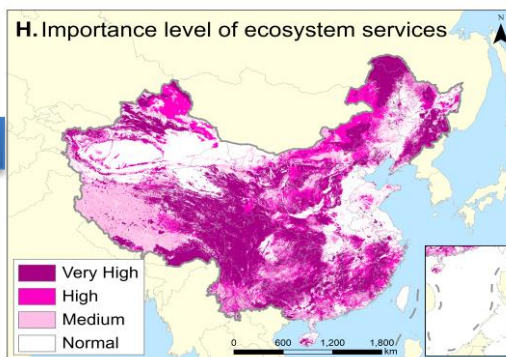
Natural scenery



F All species



H. Importance level of ecosystem services



✦ The national parks were located based on distribution of represented ecosystems, natural landscape, wildlife and ecosystem services.



Challenges

- ◆ China is one of the mega-countries in biodiversity in the world
- ◆ The protected areas, particularly, the natural reserves are not well matched with biodiversity pattern and ecosystem service pattern in China
 - ◆ 80% area of nature reserve distributed in western China, while most hotspots of biodiversity and ecosystem services in eastern and central China
- ◆ The area of individual nature reserve was small
 - ◆ 30% PAs' areas less than 1000 ha
 - ◆ 80% PAs' less than 10,000 ha
- ◆ Most NRs are the isolated “Bio-Islands”, without enough areas for wildlife and ecosystem processes conservation effectively
- ◆ Climate changes and its impacts on biodiversity are not considered in current PAs system

- ◆ Ecological civilization construction: more forests, wetland, grassland for wildlife.
- ◆ New PAs system under planning, including national park, natural reserves, natural parks(wetland parks, forest parks, geological parks, marine parks)
- ◆ Natural forest protection policy
- ◆ Ecological protection redline system: integration of ecosystem services and biodiversity protection.

An aerial photograph of a landscape during autumn. The background is a dense forest with trees showing vibrant orange, red, and yellow foliage. In the foreground, there is a large, open grassy field with some scattered trees, including a prominent cluster of white-barked trees. The lighting suggests a low sun, creating long shadows and a warm, golden glow over the scene.

Chinese Academy of Sciences (CAS)
Ministry of Environmental Protection of China
National Development and Reform Council of China
Ministry of Science and Technology of China
State Forestry and Grassland Administration
Natural Capital Project

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