Ready for AI: China's Eco-environmental Zoning-based Regulation System

Liwen Zhan

EIA Engineer & ESG Analyst

Center for Environmental Management Research, CRAES, China

zhanliwen12@gmail.com or zhan.liwen@craes.org.cn

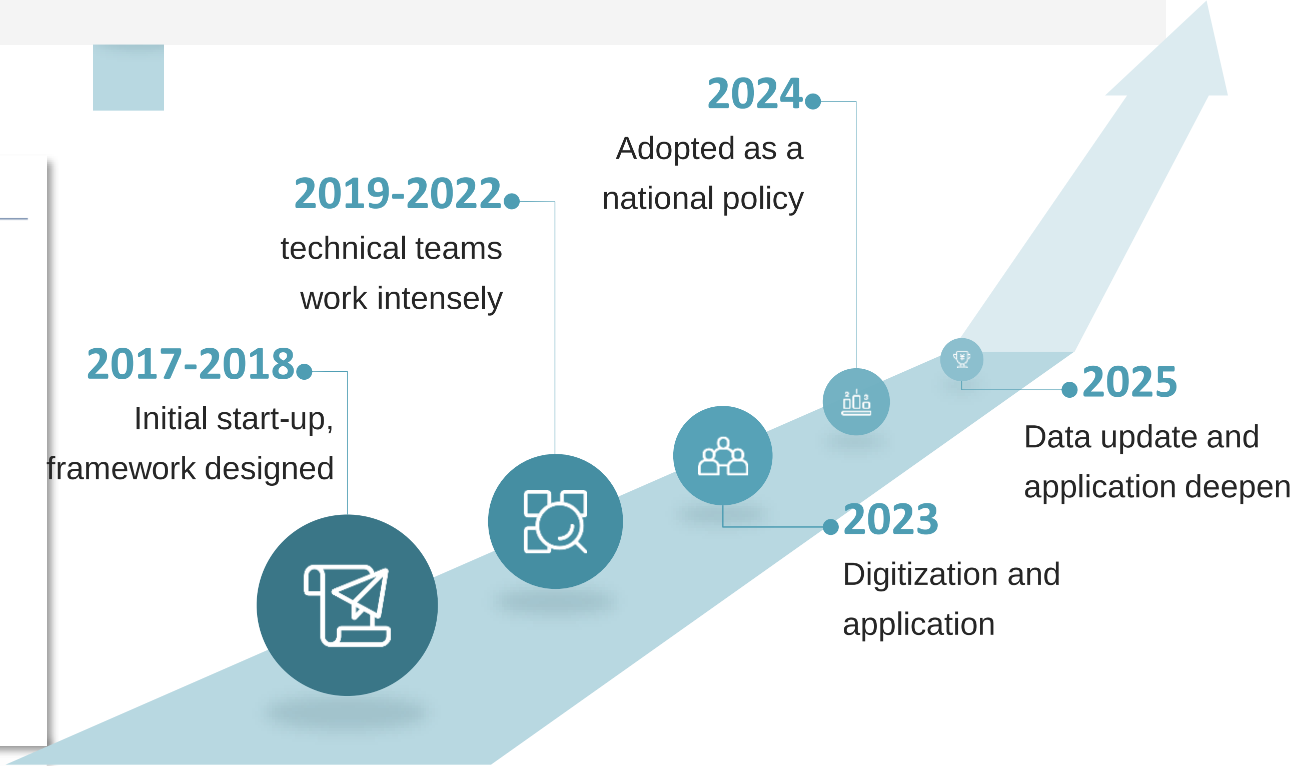
www.craes.cn

Concept and Timeline of EZR System

中國環境科學研究院
Chinese Research Academy of Environmental Sciences

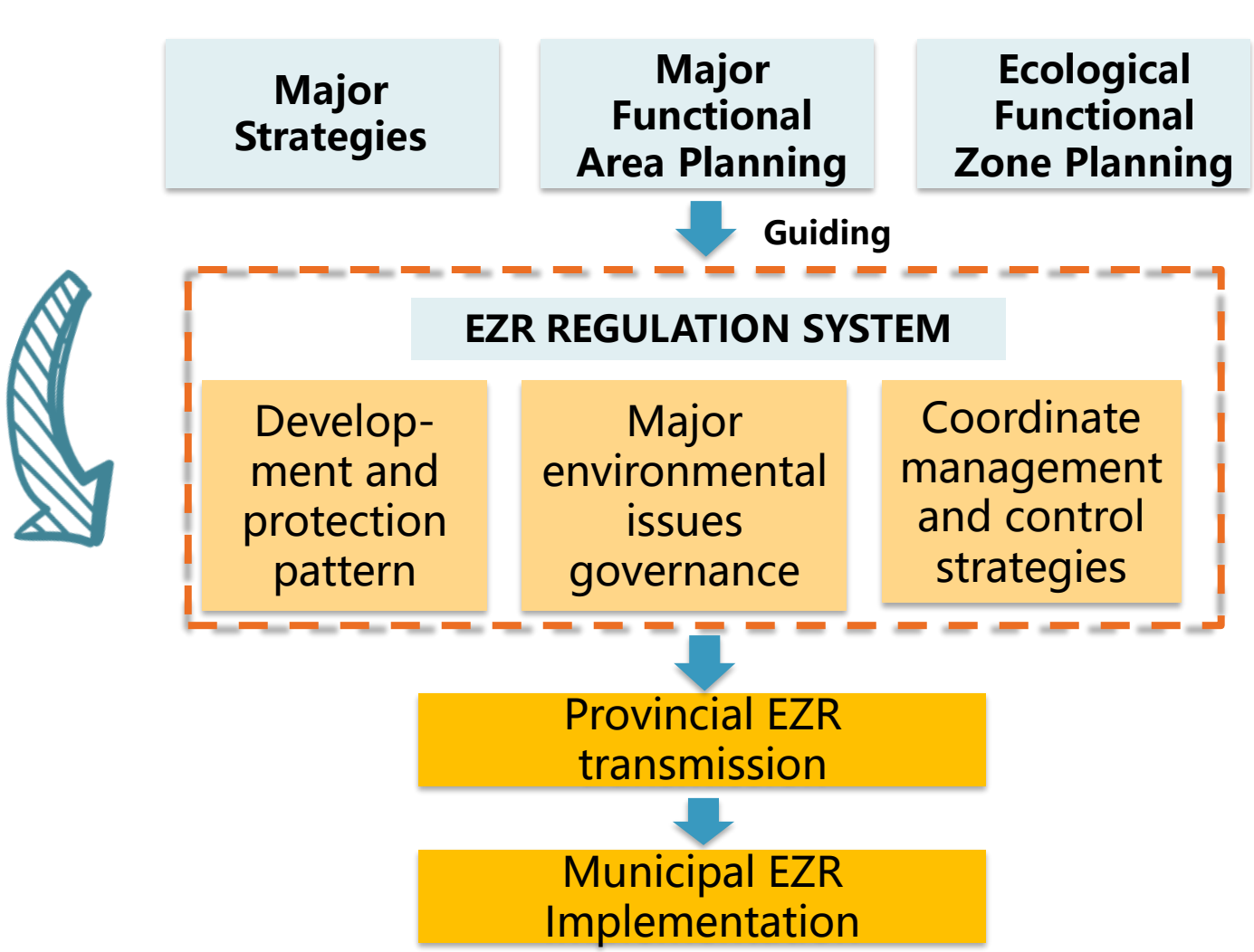
Core concept: Eco-environmental Zoning-based Regulation System is a regional, differentiated, and precise environmental management system that aims to maintain ecological functions and improve environmental quality. It is an important measure to improve the level of modernization of ecological environmental governance.

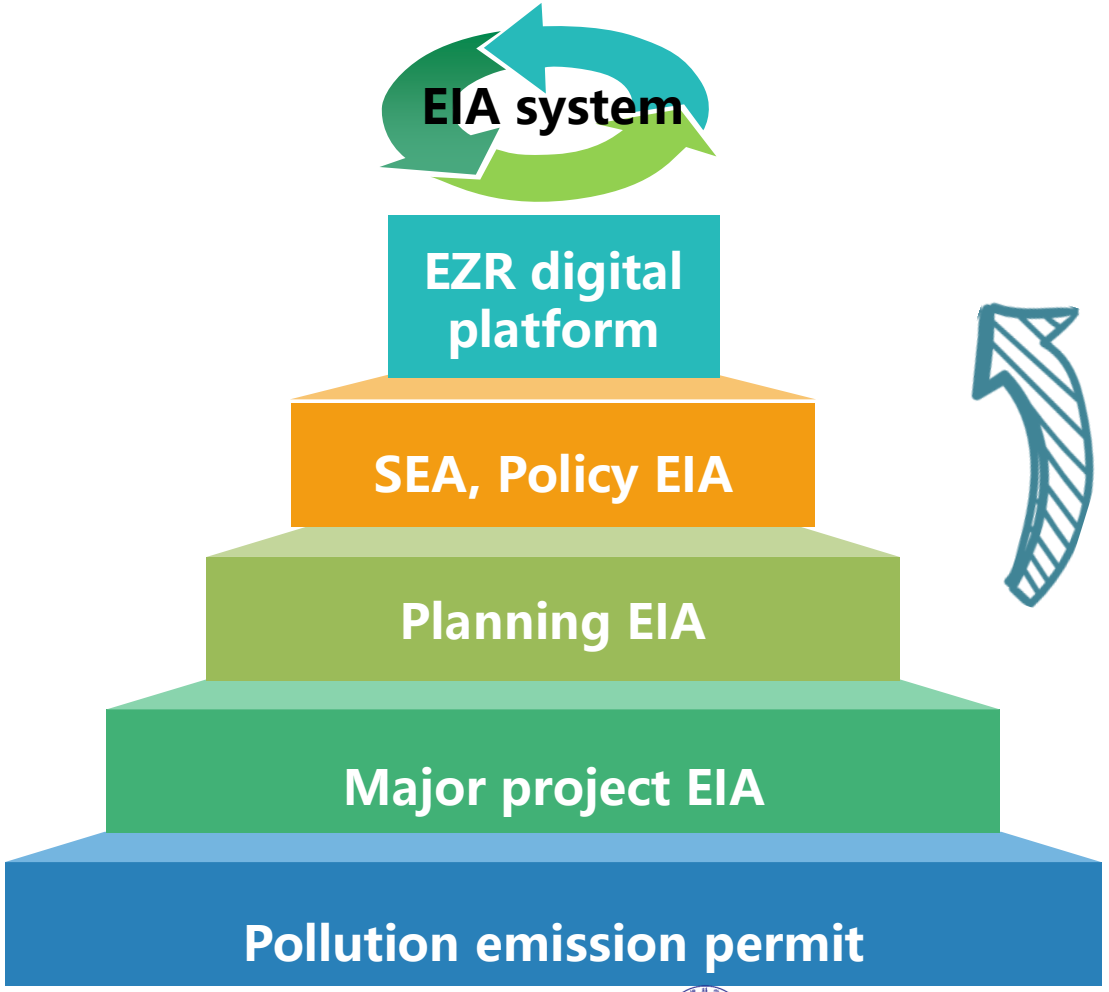

生态环境部办公厅文件
环办环评〔2018〕23号
关于印发《区域空间生态环境评价工作实施方案》的通知
中华人民共和国中央人民政府
中共中央 国务院
关于全面推进美丽中国建设的意见
（2023年12月27日）
中华人民共和国中央人民政府
中共中央办公厅 国务院办公厅关于加强生态环境分区管控的意见



Supporting the Management of Complex National Environment

- **Top-down strategic transmission:** serving the country's major strategies and implementing the national main functional area planning





EZR Platform Results

中國環境科学研究院
Chinese Research Academy of Environmental Sciences

One unified national zoning map

01 Powerful national-level data foundation:

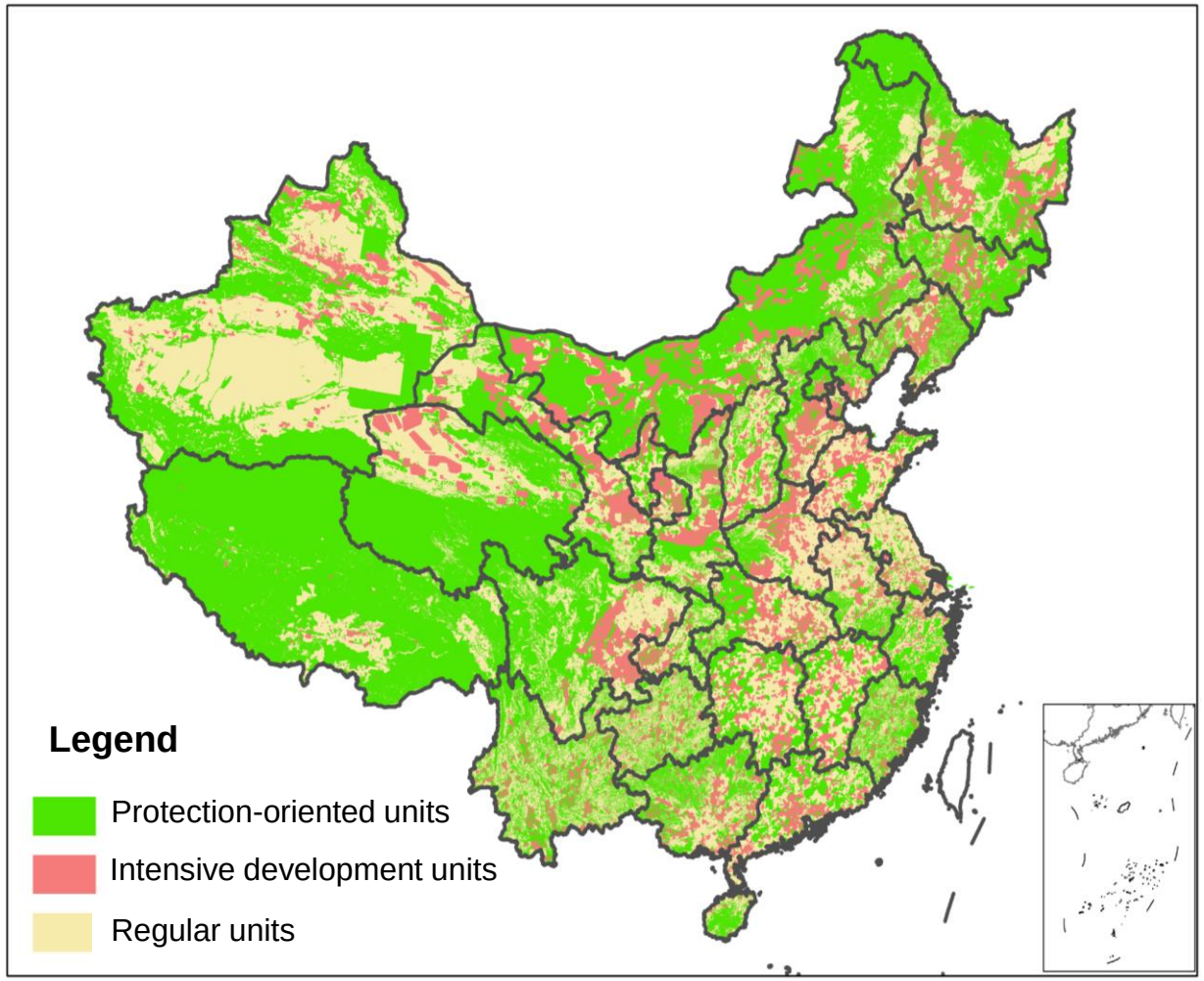
Establish three functional modules for results submission, results review and spatial analysis.

02 Submission status of provinces:

800+ spatial layers, 40,000+ land and sea environmental units, 180,000+ various element divisions, and 580,000+ control list requirements. A visual information system covering the entire national space has been formed.

03 Explore various types of environmental management application services:

spatial conflict analysis, project spatial access analysis, industrial park management, investment promotion pre-examination and other fields.

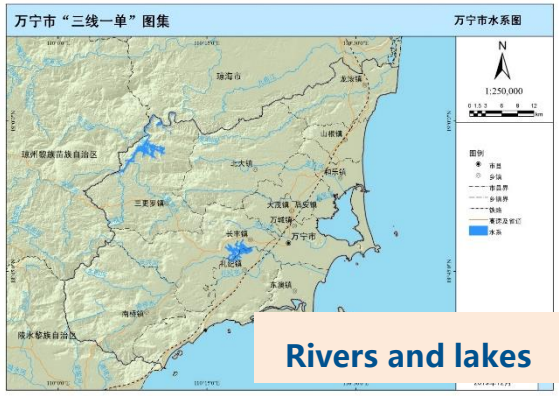


40,000+ integrated regulatory zones in China

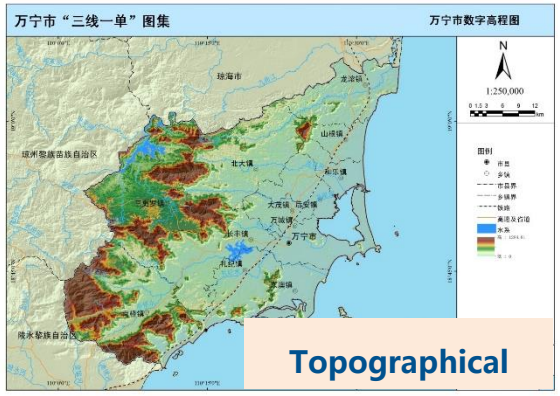
EZR System's Environment "Source Code"

中國環境科学研究院
Chinese Research Academy of Environmental Sciences

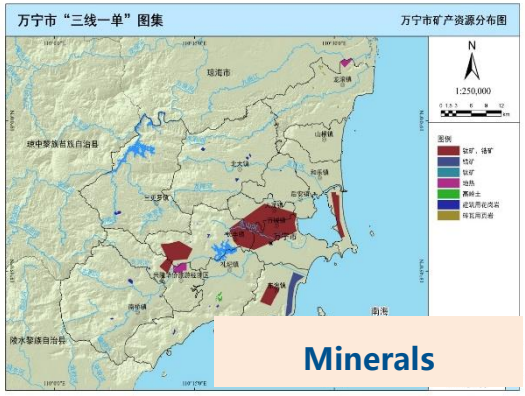
Administrative divisions



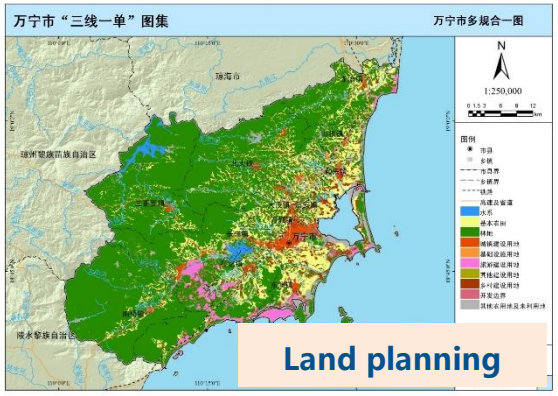
Rivers and lakes



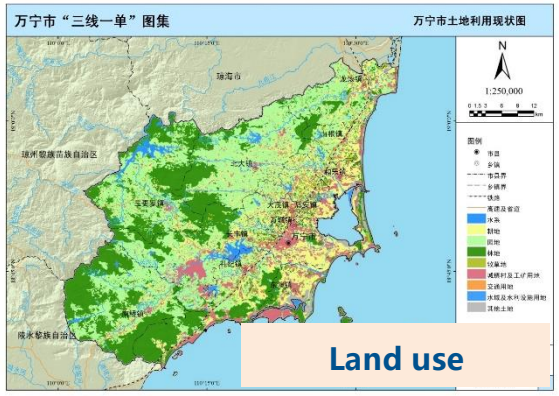
Topographical



Minerals

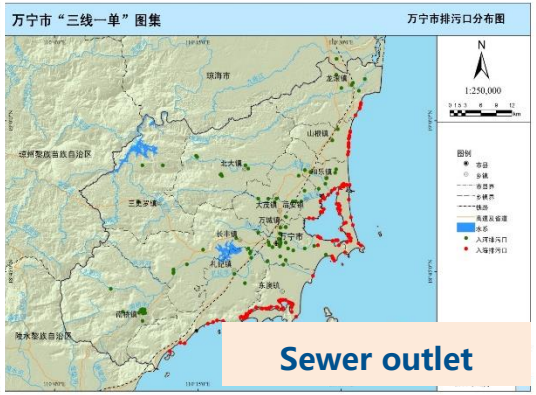


Land planning



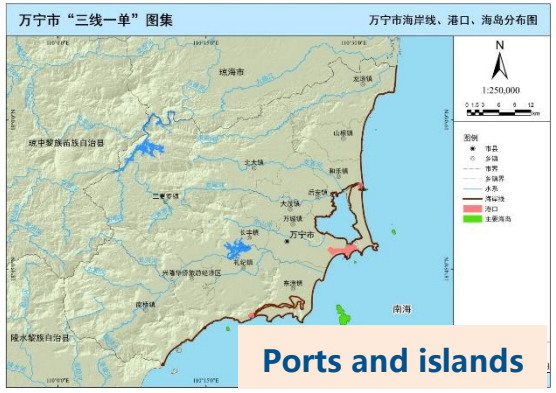
Land use

Industrial parks

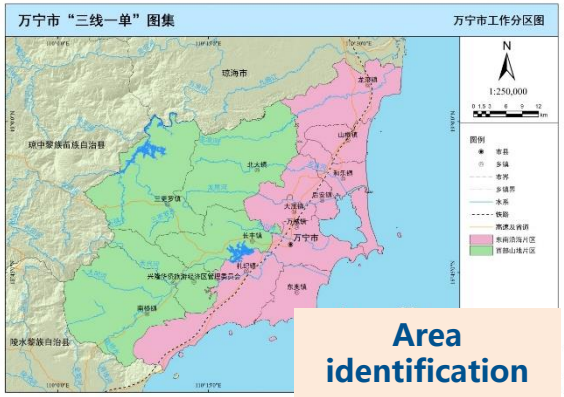


Sewer outlet

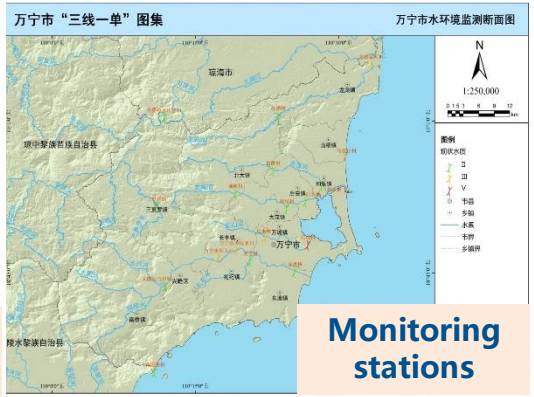
Offshore outfall



Ports and islands



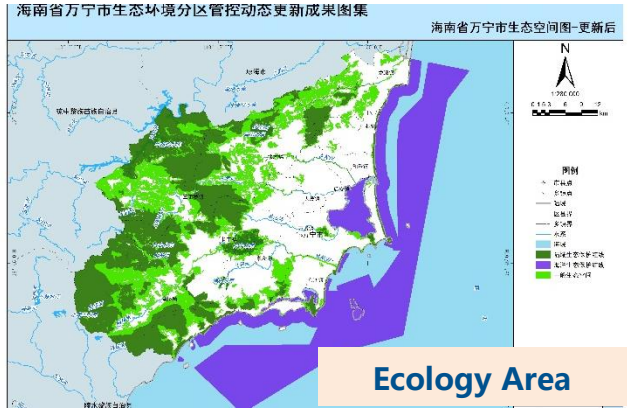
Area identification



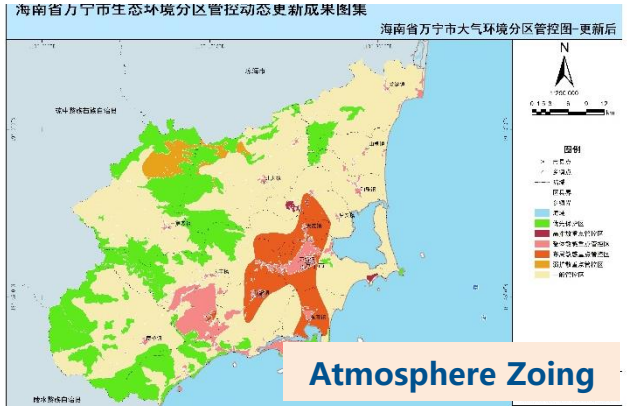
Monitoring stations

EZR System's Environment "Source Code"

中国环境科学研究院
Chinese Research Academy of Environmental Sciences



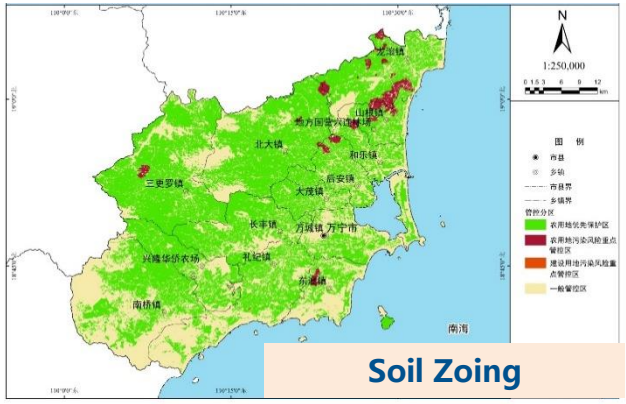
Ecology Area



Atmosphere Zoing

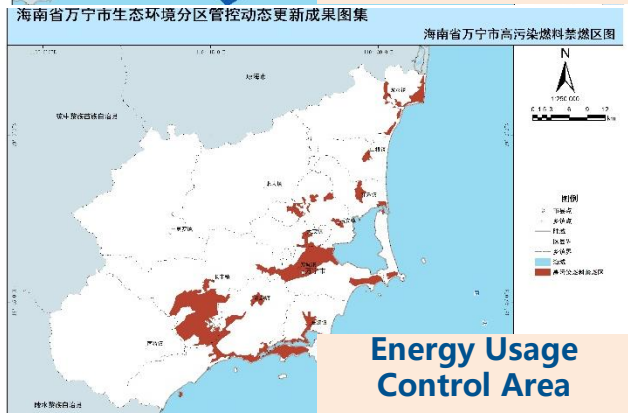
Surface Water Zoing

Offshore Zoing



Soil Zoing

Water Resource Zoing



Energy Usage Control Area

Land Resource Zoing

Shoreline Zoing

Regulations Followed by EZR digitalization

中國環境科学研究院
Chinese Research Academy of Environmental Sciences

Unified compilation standards	**GB/T 17278-2009** Basic requirements for digital topographic map products
	GB/T 19710.1-2023 Geographic information metadata Part 1: Basics
	GB/T 22239-2019 Basic requirements for network security level protection of information security technology
Unified database standards	**GB/T 33453-2016** Specification for the construction of basic geographic information databases
	GB/T 38674-2020 Information security technology application software security programming guide
Unified mapping standards	**GB/T 7408.1-2023** Date and time information exchange representation Part 1: Basic principles
	HJ/T 416-2007 Environmental information terminology
	HJ/T 419-2007 Environmental database design and operation management specification
Information security standards	**HJ 729-2014** Technical specification for environmental information system security
	Technical Guidelines for the Preparation of Eco-environmental Zoning-based Regulation System (Trial) **(No. 99, 2017)**
	Technical Requirements for the Preparation of Eco-environmental Zoning-based Regulation System (Trial) **(No. 14, 2018)**
Government information resource sharing	Data Specifications for Eco-environmental Zoning-based Regulation System Results (Trial) **(No. 18, 2018)**
	Mapping Specifications for Eco-environmental Zoning-based Regulation System (Trial) **(No. 4, 2019)**
	Interim Measures for the Management of Sharing of Government Information Resources **(No. 51, 2016)**

Key Function of EZR Platform

中國環境科学研究院
Chinese Research Academy of Environmental Sciences

Key Function： spatial access analyze

Whether a site selection is wise:

When you want to select a site for a new project, the platform provide the unit type and access requirements, and assist in the analysis conclusion.

Provide basic requirements for industry access:

such as "prohibition of specific types of industrial access", "prohibition of chemical raw materials and chemical products manufacturing industry", "prohibition of heavy metal emission enterprises", etc.

More details and suggestions for conflict:

Some provinces use local big data platforms or relevant data resources, such as environmental sensitive points, pollution cite, environmental monitoring, industrial parks and others.

Developing function:

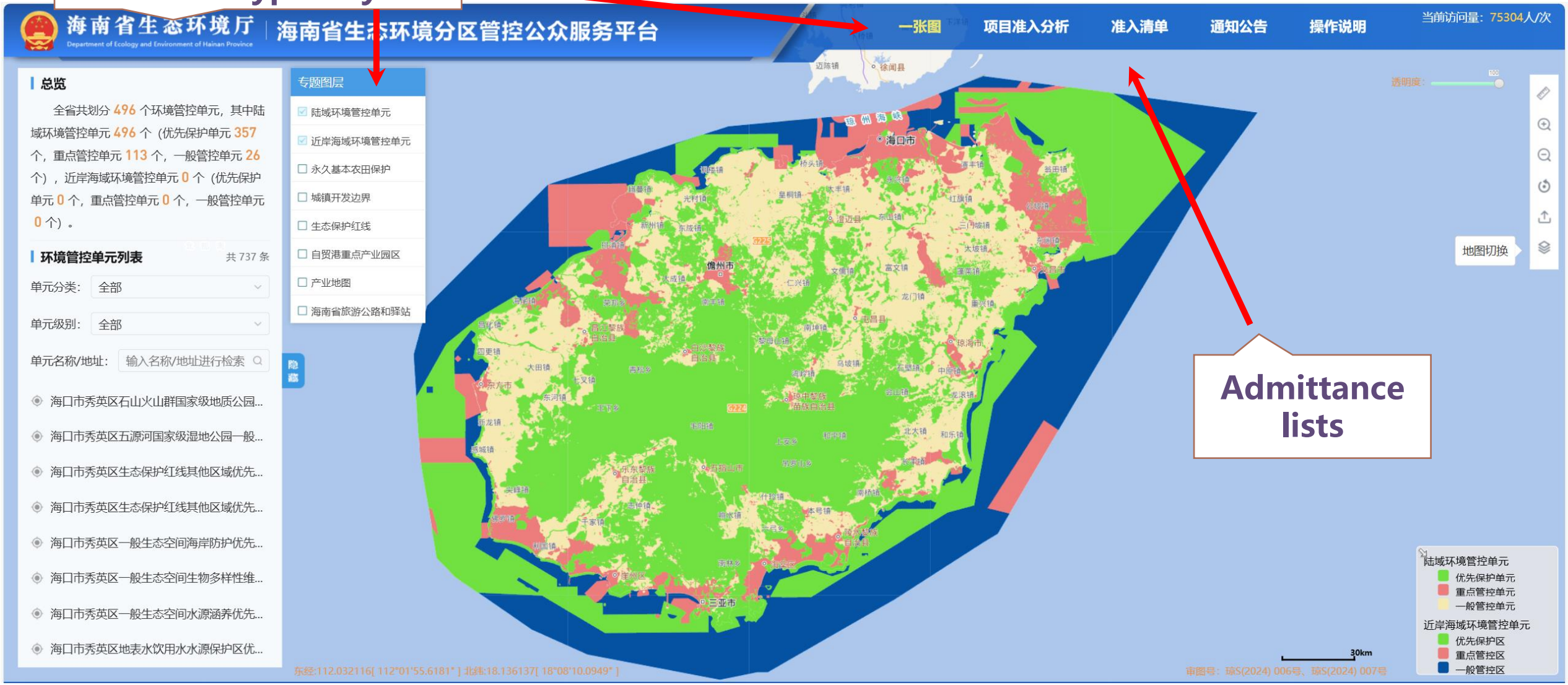
Recommend accessible industrial parks. 2) provide of NIMBY site information such as: livestock farms, waste incineration plant, airport, ports, train lines, hazardous waste treatment facility……

EZR System's Platform Website

中国环境科学研究院
Chinese Research Academy of Environmental Sciences

"One map" and different types layers

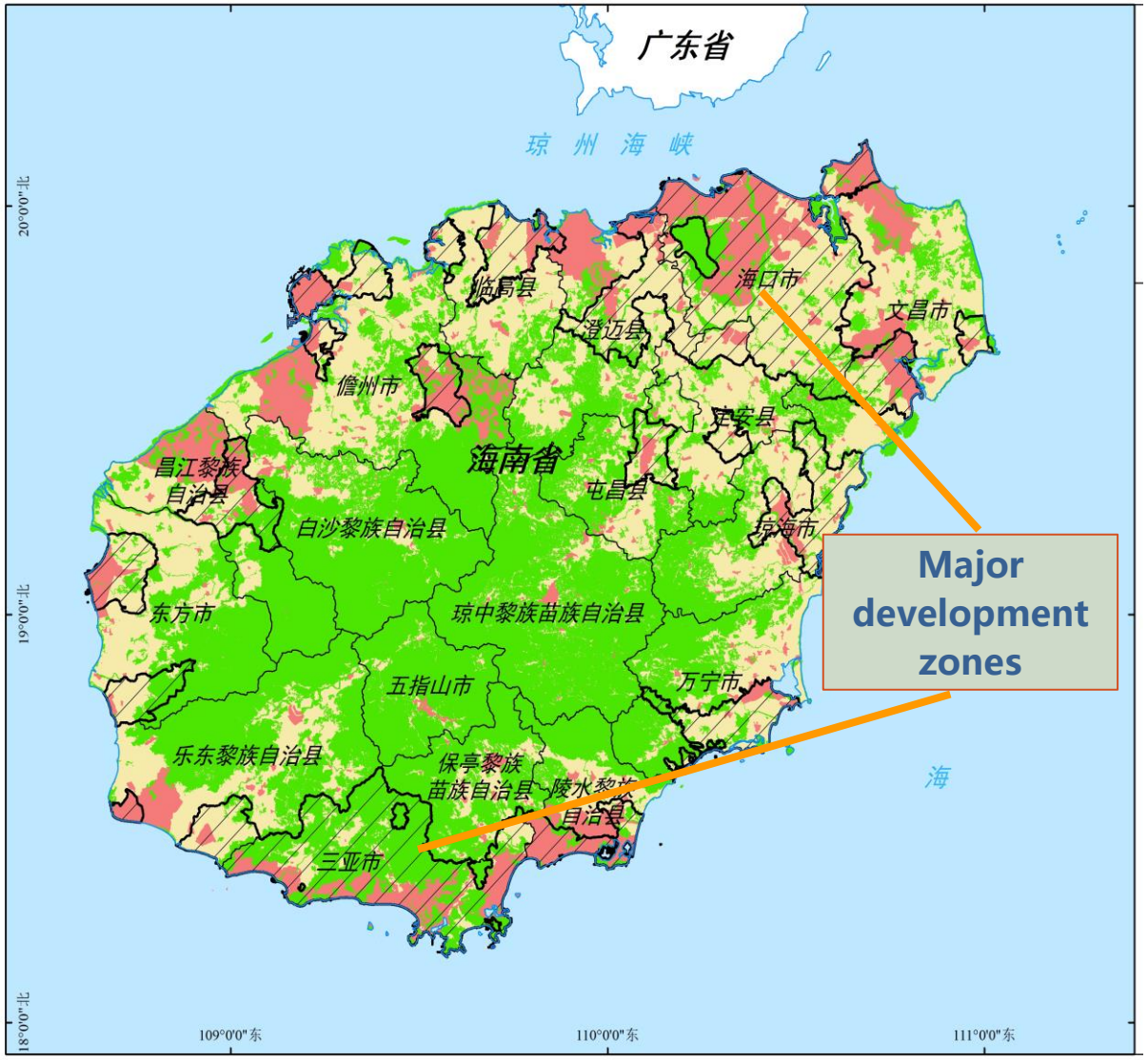
Hainan Province EZR Public Service Platform

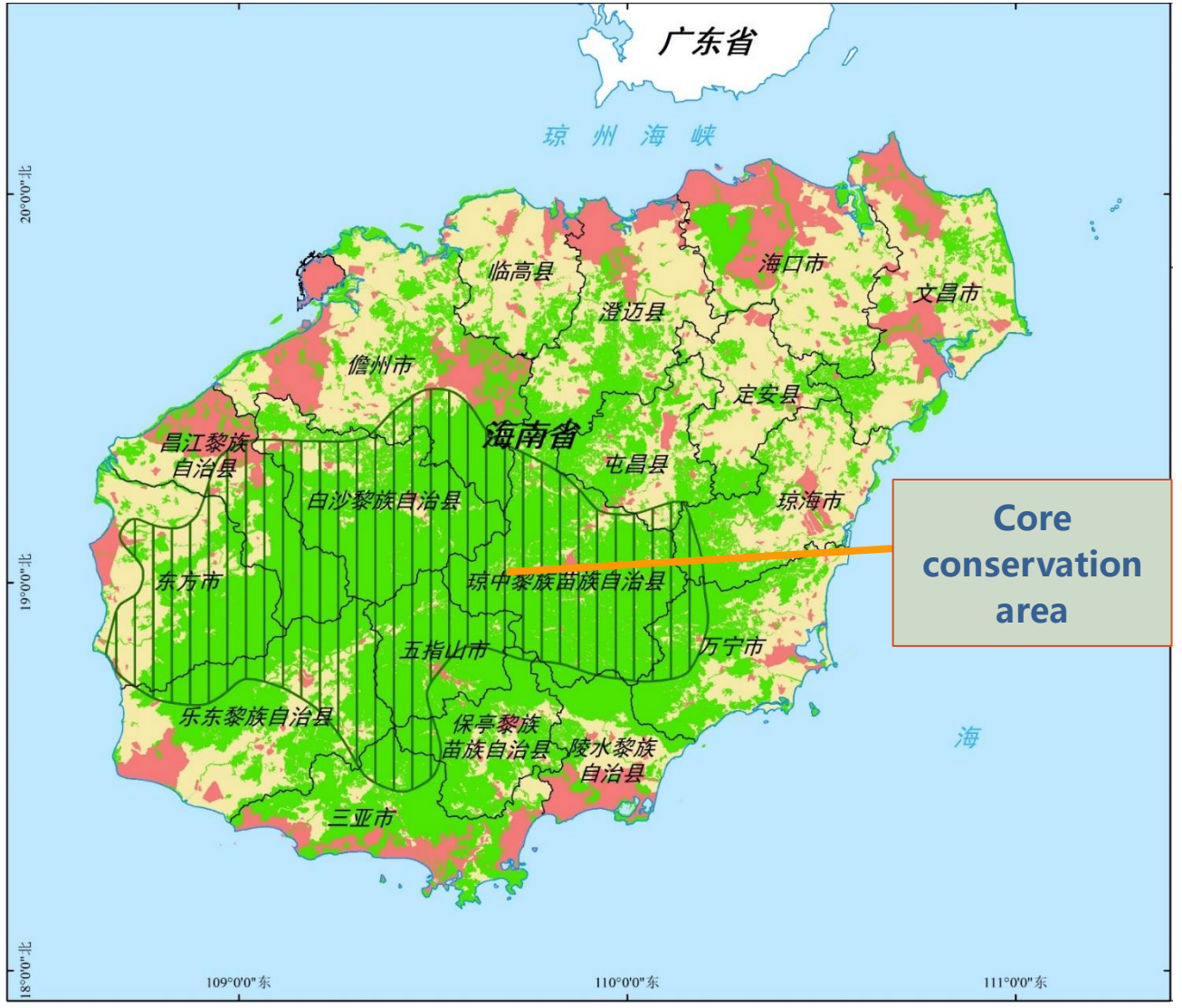


Admittance lists

EZR System's Provincial Case

中國環境科学研究院
Chinese Research Academy of Environmental Sciences



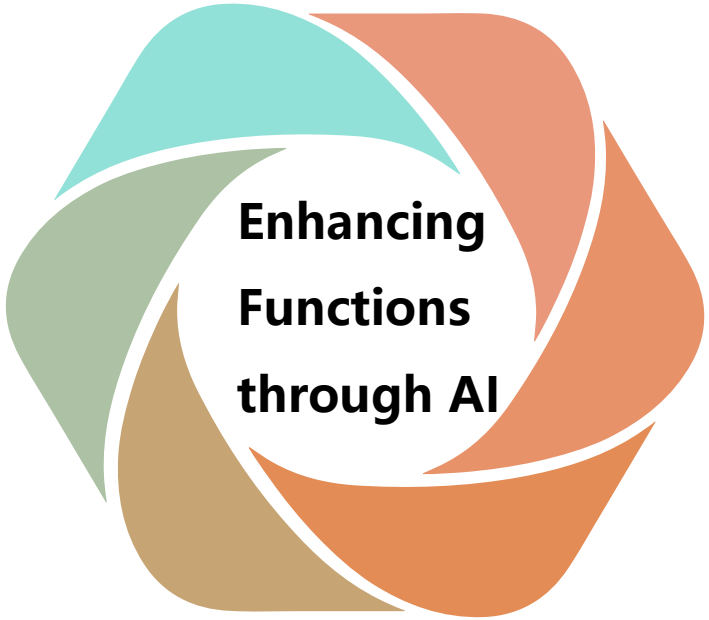


AI Application Paths

Standardization | Visualization | Accurate Vetor Data → Automation | Intelligence

Data Cleaning

Image Recognition



Complex Calculation

Customized Recommendations

Human-Machine Cooperative Decision Making

Unstructured Text Parsing

AI Application Vision

中國環境科学研究院
Chinese Research Academy of Environmental Sciences

Existing problems:	The application scenarios and fields of the system are limited, and its effectiveness is unclear.
Core needs:	Regulation and service of government decision-making and market entity construction behavior via the EZR system.

AI search

- Enhanced searches, environmental data searches, specialized field searches
- Improved source quality
- combine internal and external databases to enhance the experience

AI summary

- Summarize content input through different media types (e.g., text, links, video, audio)

AI translate

AI Enhance the reports

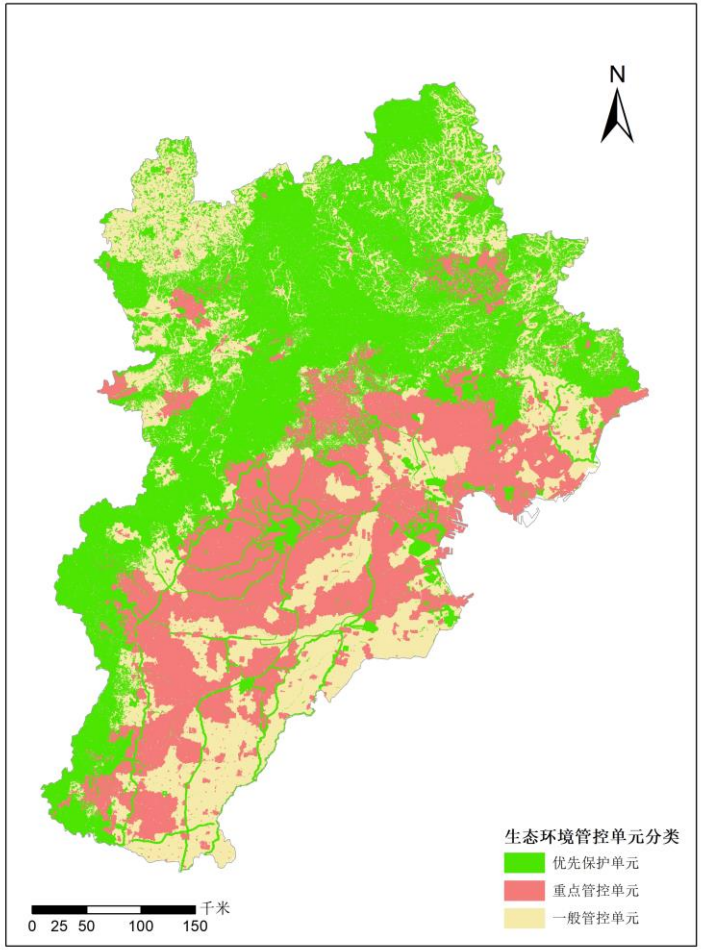
AI Document review

AI trend analysis

EZR System's Regional Cases

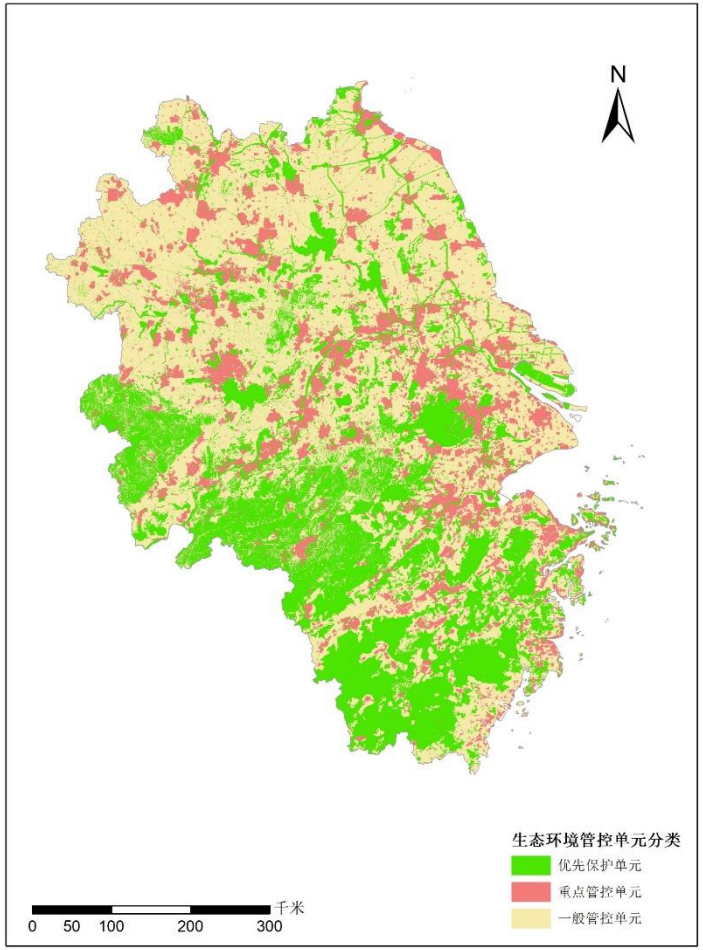
中國環境科学研究院
Chinese Research Academy of Environmental Sciences

京津冀生态环境分区管控图



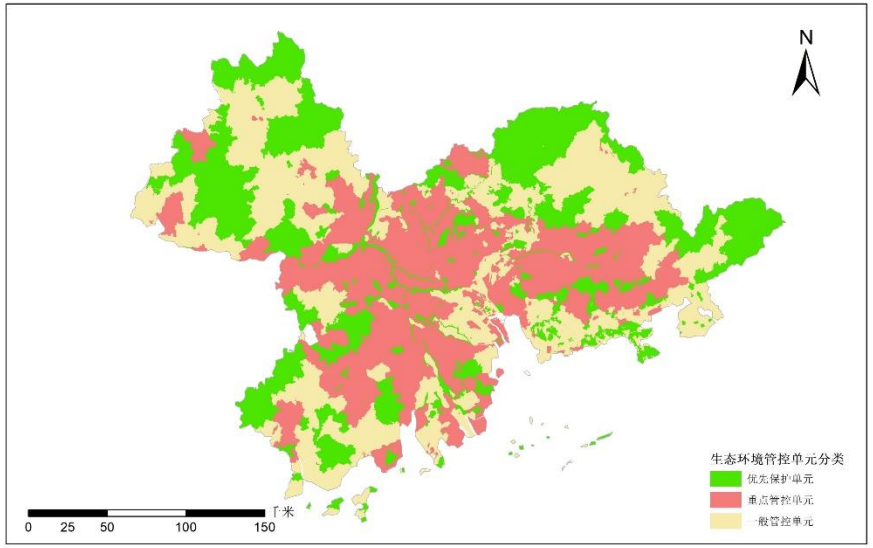
Beijing-Tianjin-Hebei

长三角生态环境分区管控图



Yangtze River Delta

珠三角生态环境分区管控图



Pearl River Delta

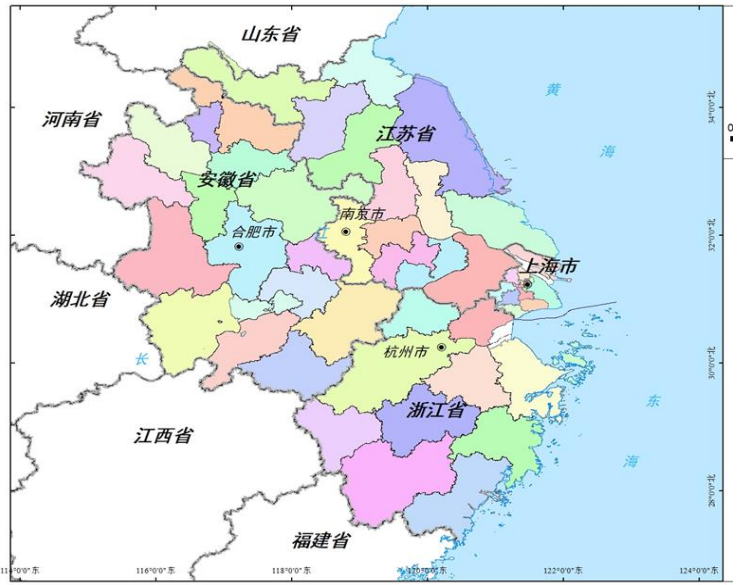
EZR System's Regional Cases

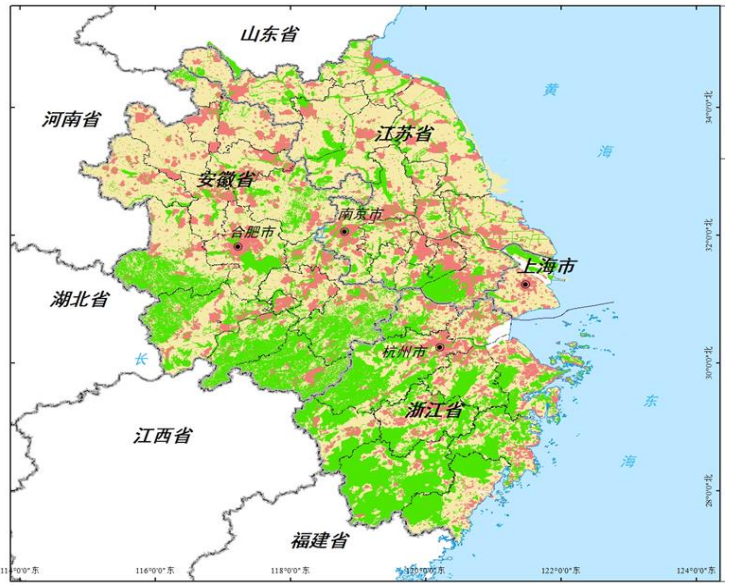
中國環境科学研究院
Chinese Research Academy of Environmental Sciences

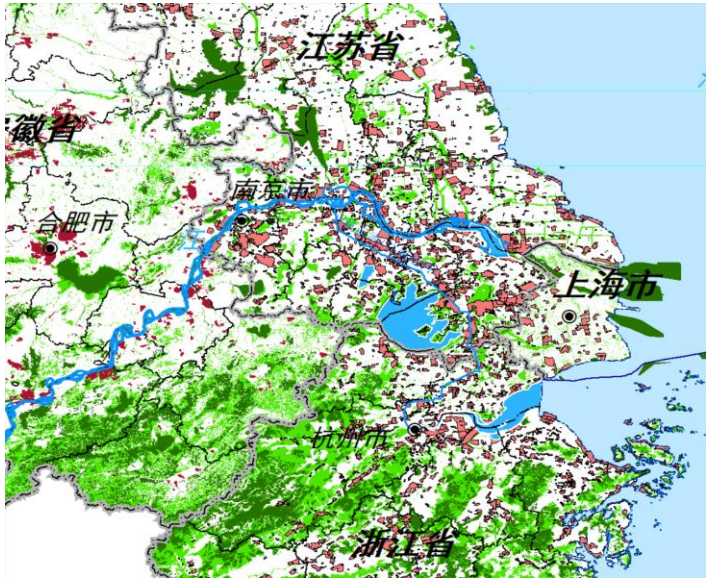
Integration Studies of Key Regions

☐ **Yangtze River Delta region:** Shanghai, Jiangsu, Zhejiang, and Anhui, located in the **East China region**

- Determine any protection areas adjacent to development areas (especially heavily polluted areas) at the interface between provinces, and take measures according to main ecological functions.
- Identify inconsistent air quality targets in the same region, or unreasonable water quality targets upstream and downstream of the same river







Policy trends: efficiency and possible risks

中國環境科学研究院
Chinese Research Academy of Environmental Sciences

- **AI could improve political efficiency and precision, but also raises challenges of lack of transparency, privacy invasion and opinion manipulation**

Intelligent Decision Making

Data Security

Social Governance

Information Dissemination

A data-driven approach helps governments and organizations improve efficiency and accuracy in their policy and strategy development processes. 01

Enhance social governance efficiency and optimize resource allocation through AI monitoring and resource management systems. 02

Utilize accurate content recommendations and opinion guidance mechanisms to maximize public participation and information sharing. 03

Possible negative effects such as invasion of privacy, increased social surveillance, false information and guided communication

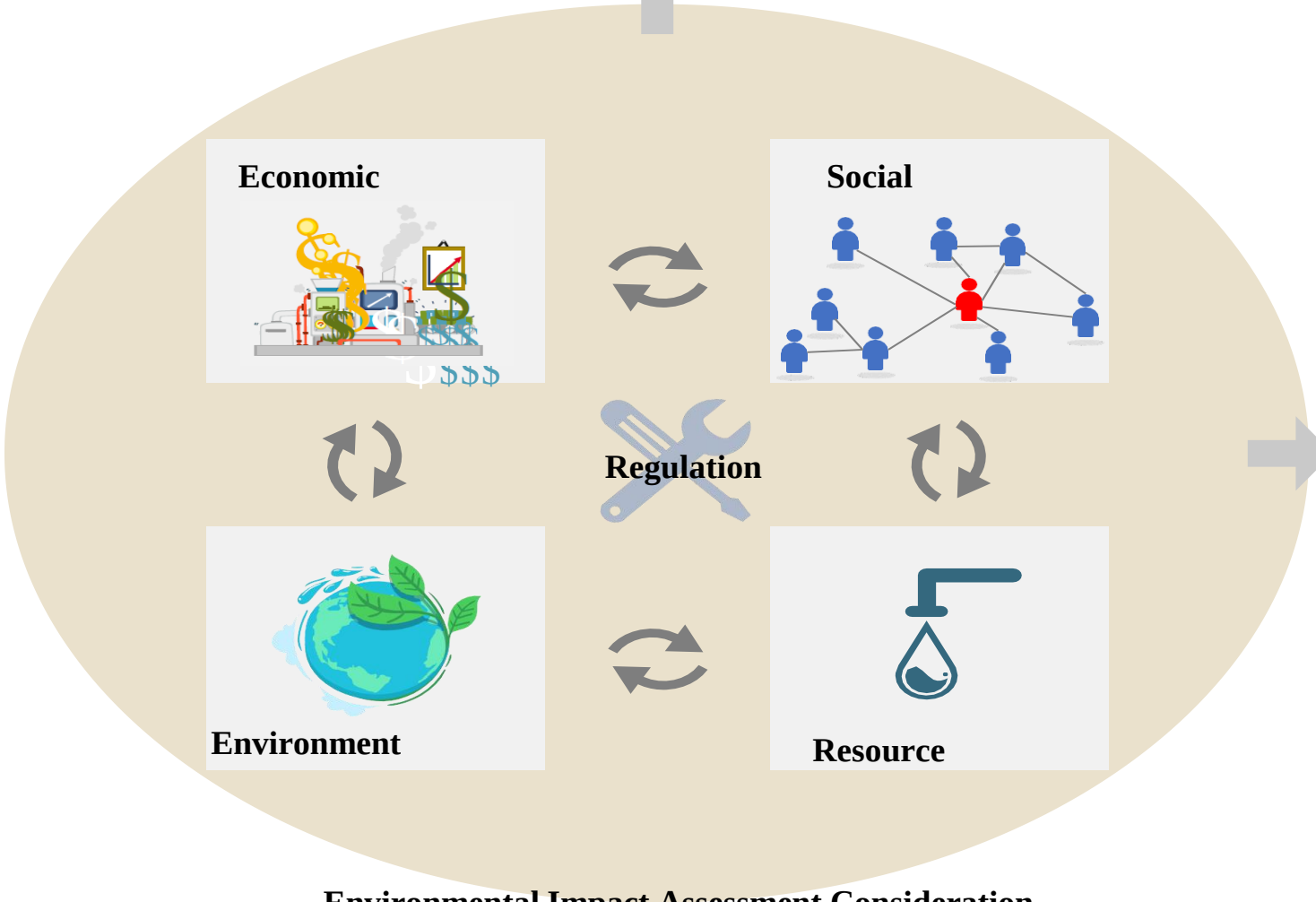
However it can lead to face the challenges of lack of transparency and difficulty in accountability.

Complexity Theory Behind the EZR System

Expected Human Activities

- Economic development
- Eco-environment improvement
- Sustainable resources
- Social stability

Variety Human Activities



- Pollutant Emissions
- Resource depletion
- Environmental quality deterioration
- Ecological degradation
- Social order issues

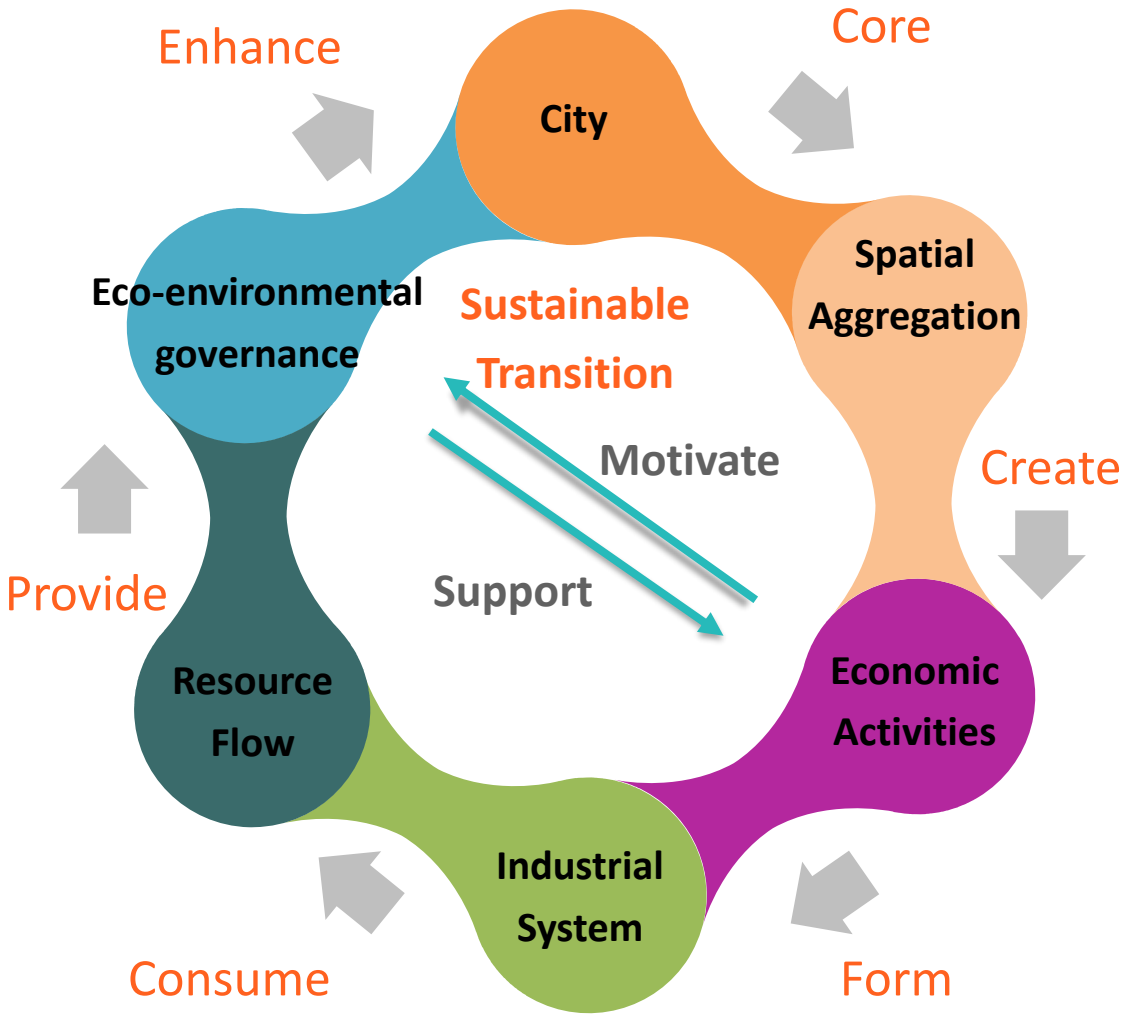
Environmental Impact Assessment Consideration

Building sustainable prosperity

中國環境科學研究院
Chinese Research Academy of Environmental Sciences

A reasonable and orderly urban spatial structure is an important foundation for promoting the overall coordination and sustainable development of regional economy, society, resources and environment.

EZR System: city-based, data-based, map-based government approach Share common ideas and concerns with SDG GOALS AND ESG



Systemic synergies:

- Government's active participation in environmental governance
- Effectively managing negative externalities of regional development
- Establishment of a high-level integrated cooperation mechanism

Creating a platform for coordination of conflicts arising from environmental, social, and economic factors

Thank you!

Grazie!

- Liwen Zhan
- EIA Engineer & ESG Analyst
- Center for Environmental Management Research, CRAES, China
- zhanliwen12@gmail.com or zhan.liwen@craes.org.cn
- www.craes.cn

Let’s continue the conversation!

Message me your questions or comments in the IAIA25 app.

Liwen Zhan

EIA Engineer & ESG Analyst

Center for Environmental Management Research, CRAES, China

zhanliwen12@gmail.com or zhan.liwen@craes.org.cn

www.craes.cn

#iaia25