GTC 2020

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An Overview of *SuperMap* technology in Brasília University: NEAz - Challenges and Opportunities

Eli Siqueira Alves, PhD
Environmental Science/Geotech/CDT
NEAz - Núcleo de Estudos da Amazônia - UnB
(Amazon Studies and Research Center)
Technological Development Center

Geo-intelligence, Connecting the Future

GIS Software Technology Conference 2020

Universidade de Brasília

INDICE

- GIS applications in research networks in Brazil
- Potential applications articulated with GIS
- The main public environmental monitoring agencies that operate the GIS databases in Brazil
- Highlight the Supermap platform
- The Amazon Space Challenge
- Conditioning factors
- Conclusion

Tel/fax: +55 (97) 3343-9700 | mamiraua@mamiraua.org.br | Estrada do Bexiga, 2.584 Bairro Fonte Boa – Tefé (AM)

Instituto de Desenvolvimento Sustentável Mamirauá

Núcleo de Estudos Amazônicos neaz. CEAM | UnB

DOE PARA O MAMIRAUÁ

Instituto de Desenvolvimento Sustentável Mamirauá

O Instituto de Desenvolvimento Sustentável Mamirauá foi criado em abril de 1999. É uma Organização Social fomentada e supervisionada pelo Ministério da Ciência, Tecnologia e Inovações, que possui 21 anos de atuação . Desde o início, desenvolve suas atividades por meio de programas de pesquisa, manejo de recursos naturais e desenvolvimento social, principalmente na região do Médio Solimões, estado do Amazonas.

INTRODUCTION

The annual PRODES deforestation rate has been used as an indicator for proposing public policies and for assessing the effectiveness of their implementations. The spatial data from PRODES are used in:

1.Certification of agribusiness production chains such as the Soy Moratorium and the Livestock Conduct Adjustment Term - TAC da Carne;

2.(b) Intergovernmental agreements such as the United Nations Conference on Climate Change (COPs) and the National Inventory Reports on Greenhouse Gas Emissions and;

3.(c) Monetary donations by the Amazon Fund, which use PRODES as reference data for the deforestation activity in the Legal Amazon.

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The Amazon Space Challenge

How many Amazons are there?

- Amazon of rivers and forests ...
- Amazon of the Indians and the rubber tappers ...
- Amazon of farmers and squatters ...
- Amazonian government and Brazilian society ...
- Amazon of the world community ...

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How many Amazons are there?
What do we need to understand the Amazon?
- Design a communication space that expresses
- Different views of the Amazon
- The multiple potentials of future scenarios
- Access to information for the whole society
- How can GIS help?

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INÍCIO SOBRE ENSINO PUBLICAÇÕES VIVÊNCIAS AMAZÔNICAS FIA EXPEDIÇÃO HUMBOLDT PESQUISA NEAZ AO VIVO
MANIFESTAÇÕES ATIVIDADES

UMA SÉRIE DE LIVES PARA MARCAR O DIA DA AMAZÔNIA

1 A 5 DE SETEMBRO / 2020

ACESSE A PROGRAMAÇÃO COMPLETA

SÉRIE DE LIVES COMEMORATIVAS DOS 20 ANOS DA EXPEDIÇÃO HUMBOLDT: RECORDAÇÕES DE UMA LONGA VIAGEM PELOS RIOS AMAZÔNICOS

SAIBA MAIS SOBRE A EXPEDIÇÃO

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Georreferenciamento

Fire Monitoring in Brazil

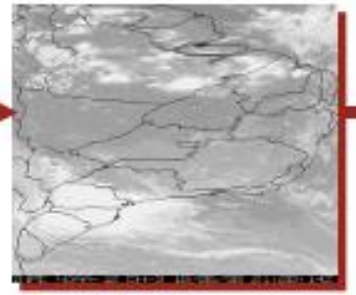
Landsat/CBERS Reception

Imagem TM

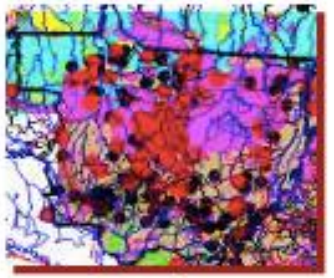
FOREST FIRE MONITORING

Cartographic Base

NOAA Reception



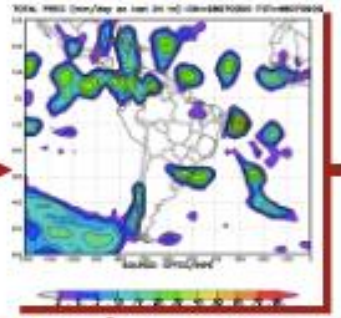
NOAA Image



Product

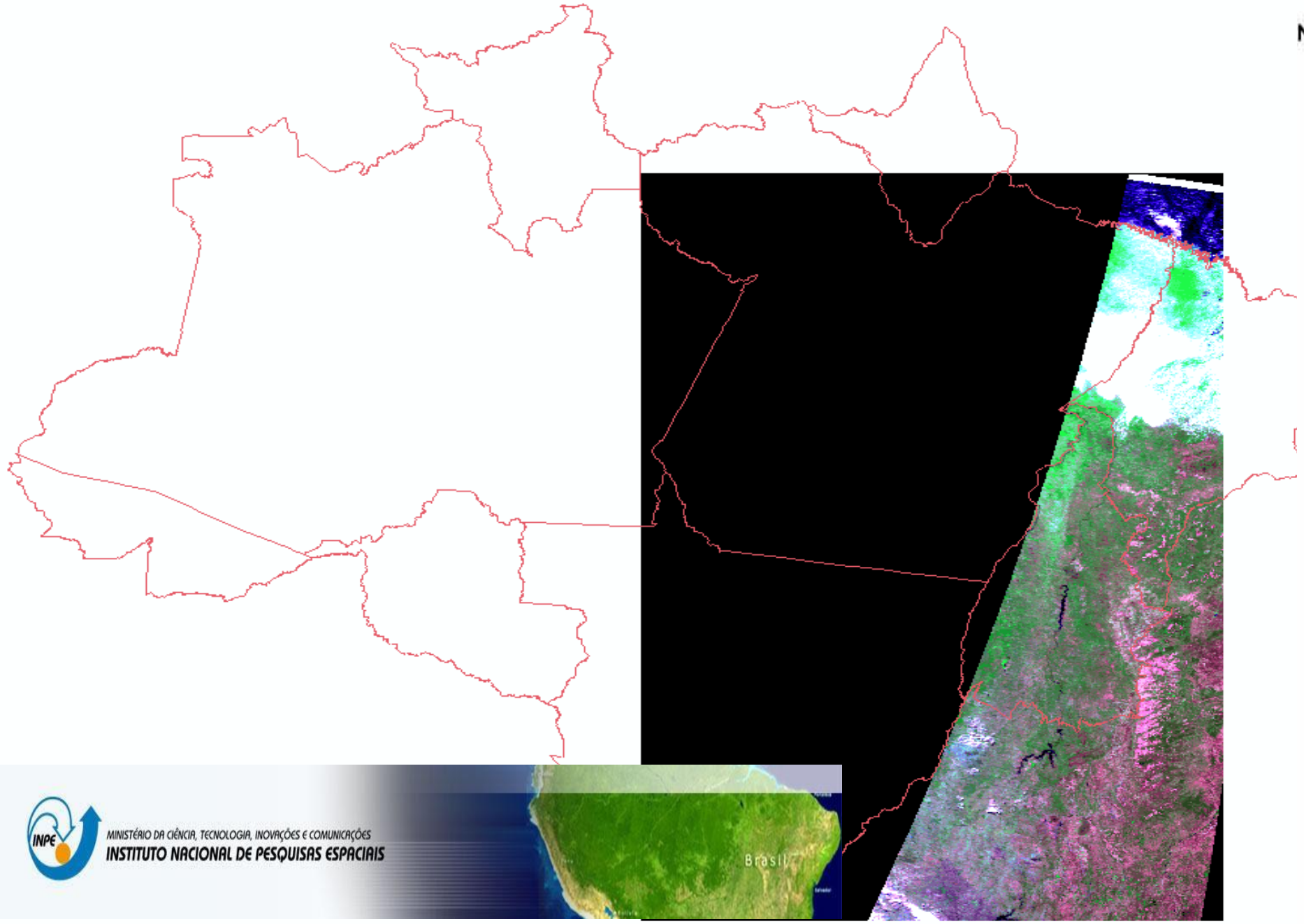
Intern et

CPTEC

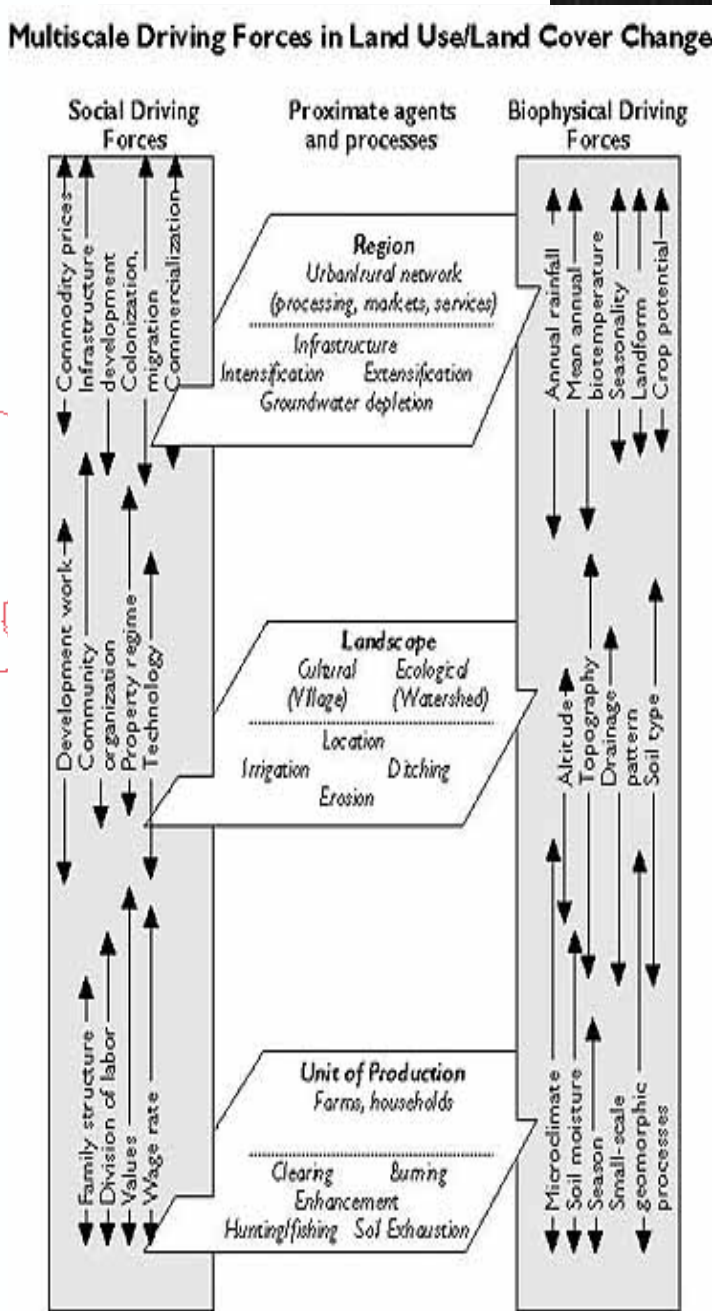


Weather Forecast

Decision Making



Brasil


Multiscale Driving Forces in Land Use/Land Cover Change
Social Driving Forces
Proximate agents and processes
Biophysical Driving Forces
Commodity prices
Infrastructure development
Colonization, migration
Commercialization
Region
Urban/rural network (processing, markets, services)
Infrastructure
Intensification
Extensification
Groundwater depletion
Annual rainfall
Mean annual biotemperature
Seasonality
Landform
Crop potential
Development work
Community organization
Property regime
Technology
Landscape
Cultural (Village)
Ecological (Watershed)
Location
Irrigation
Ditching
Erosion
Altitude
Topography
Drainage pattern
Soil type
Family structure
Division of labor
Values
Wage rate
Unit of Production
Farms, households
Clearing
Burning
Enhancement
Hunting/fishing
Soil Exhaustion
Microclimate
Soil moisture
Season
Small-scale geomorphic processes

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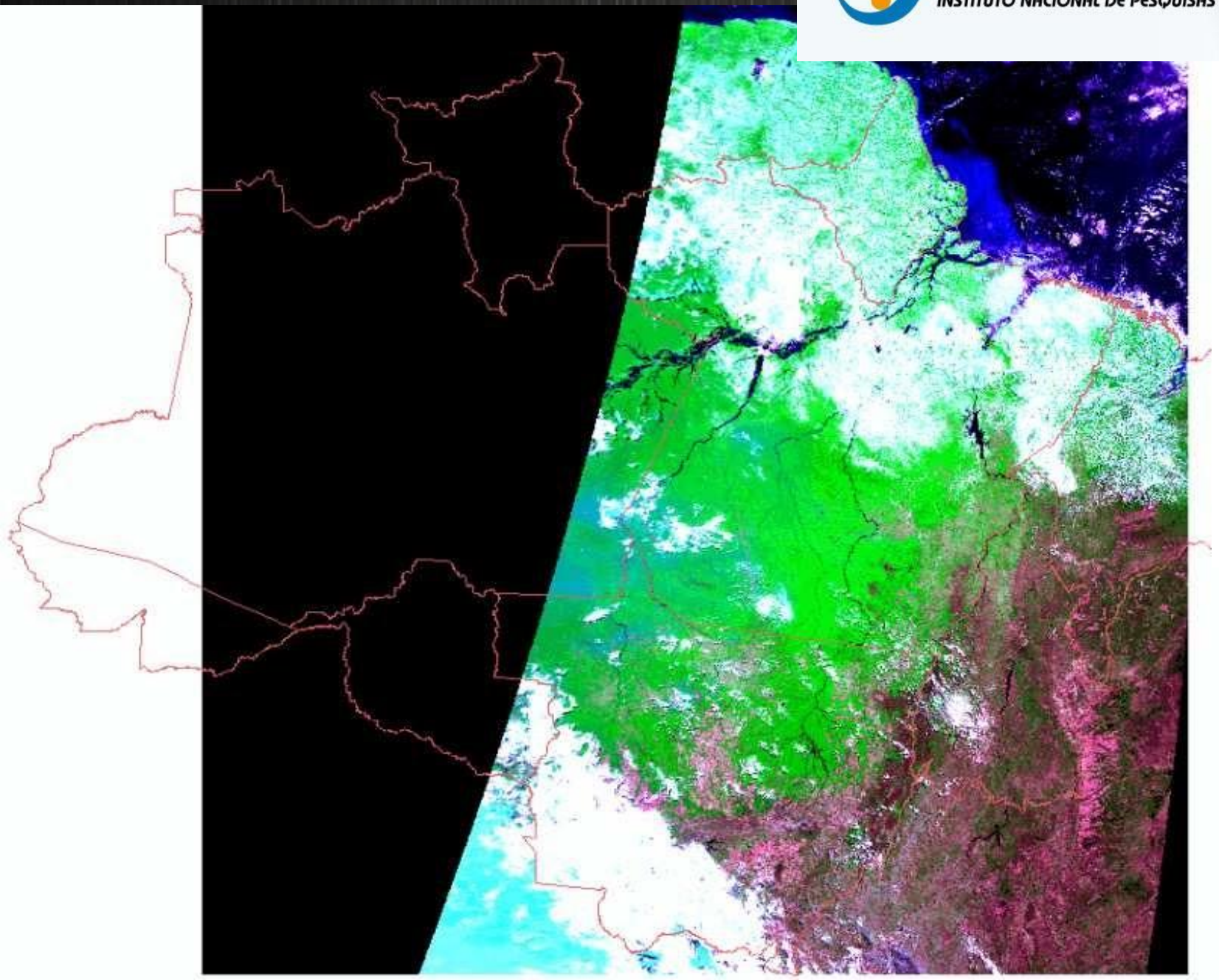

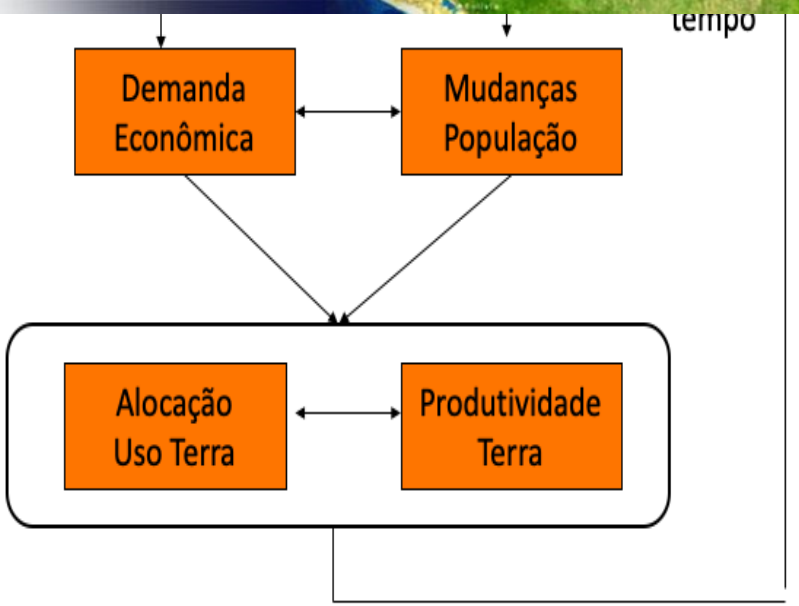

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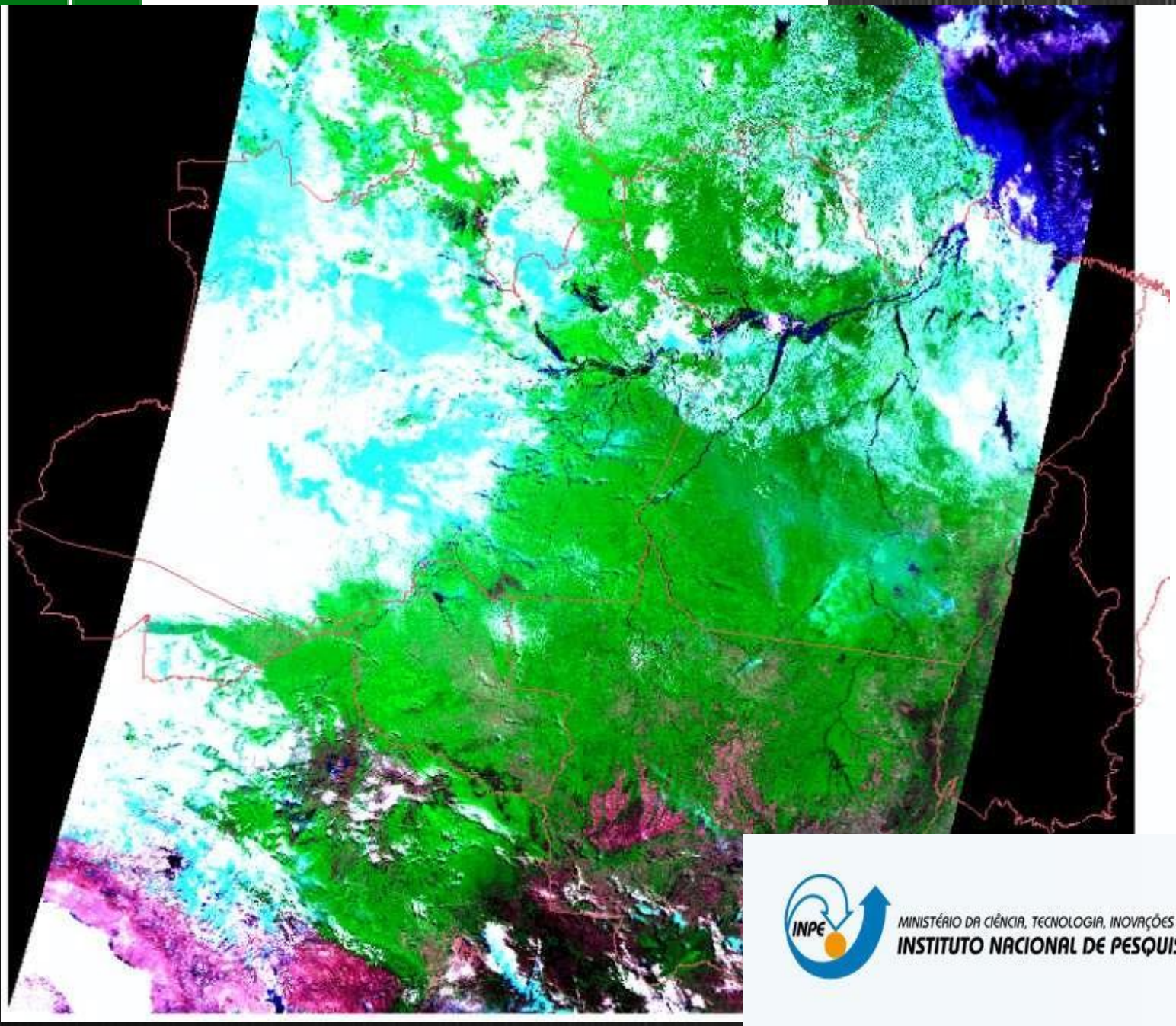

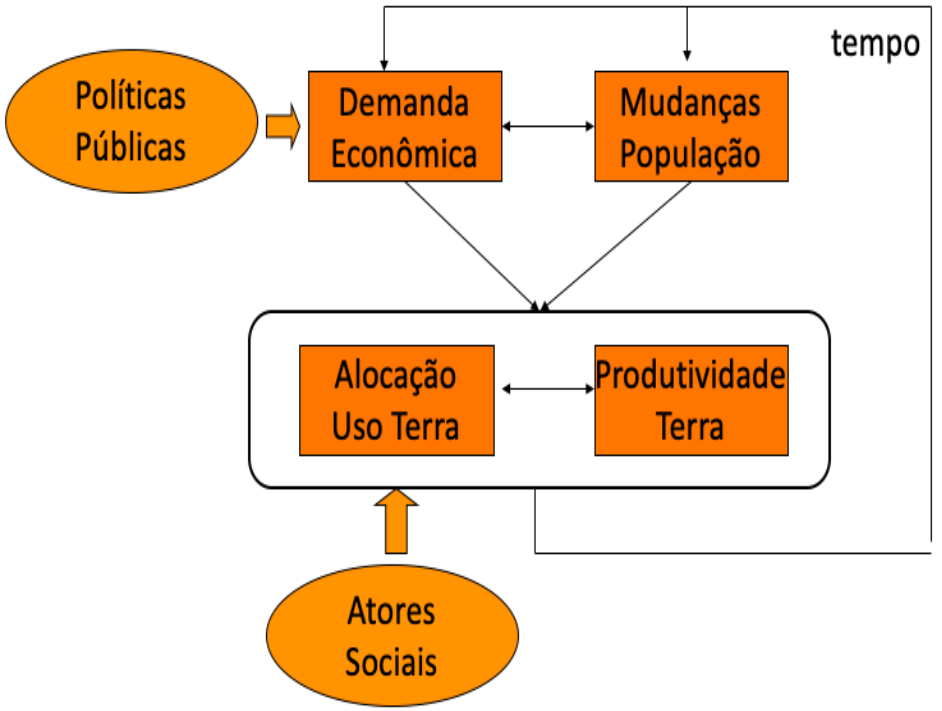

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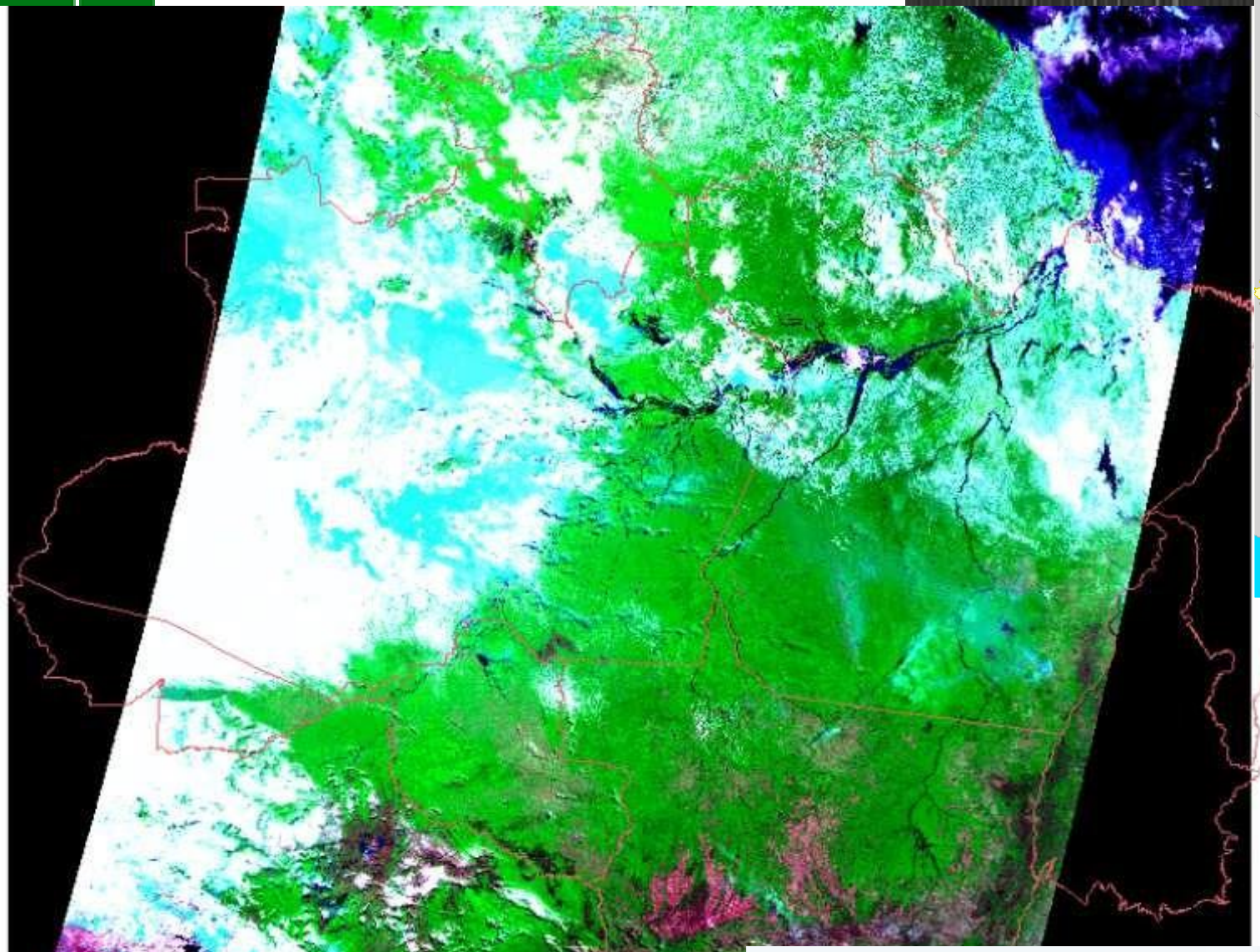

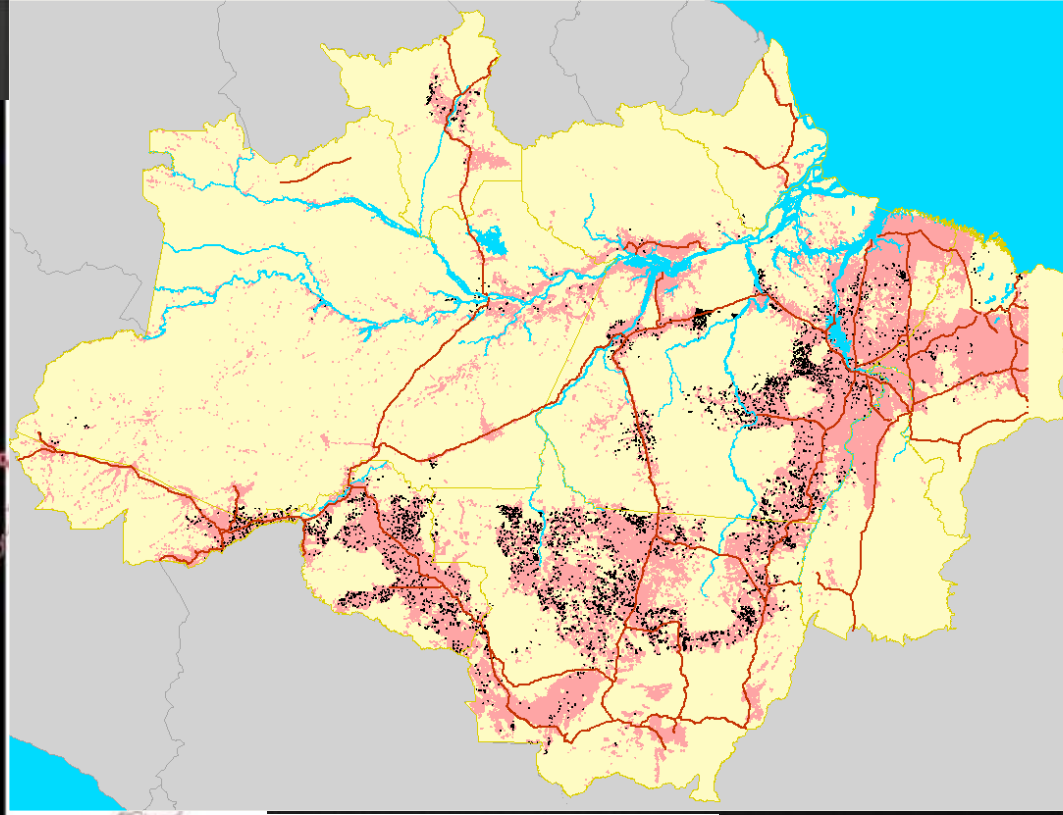

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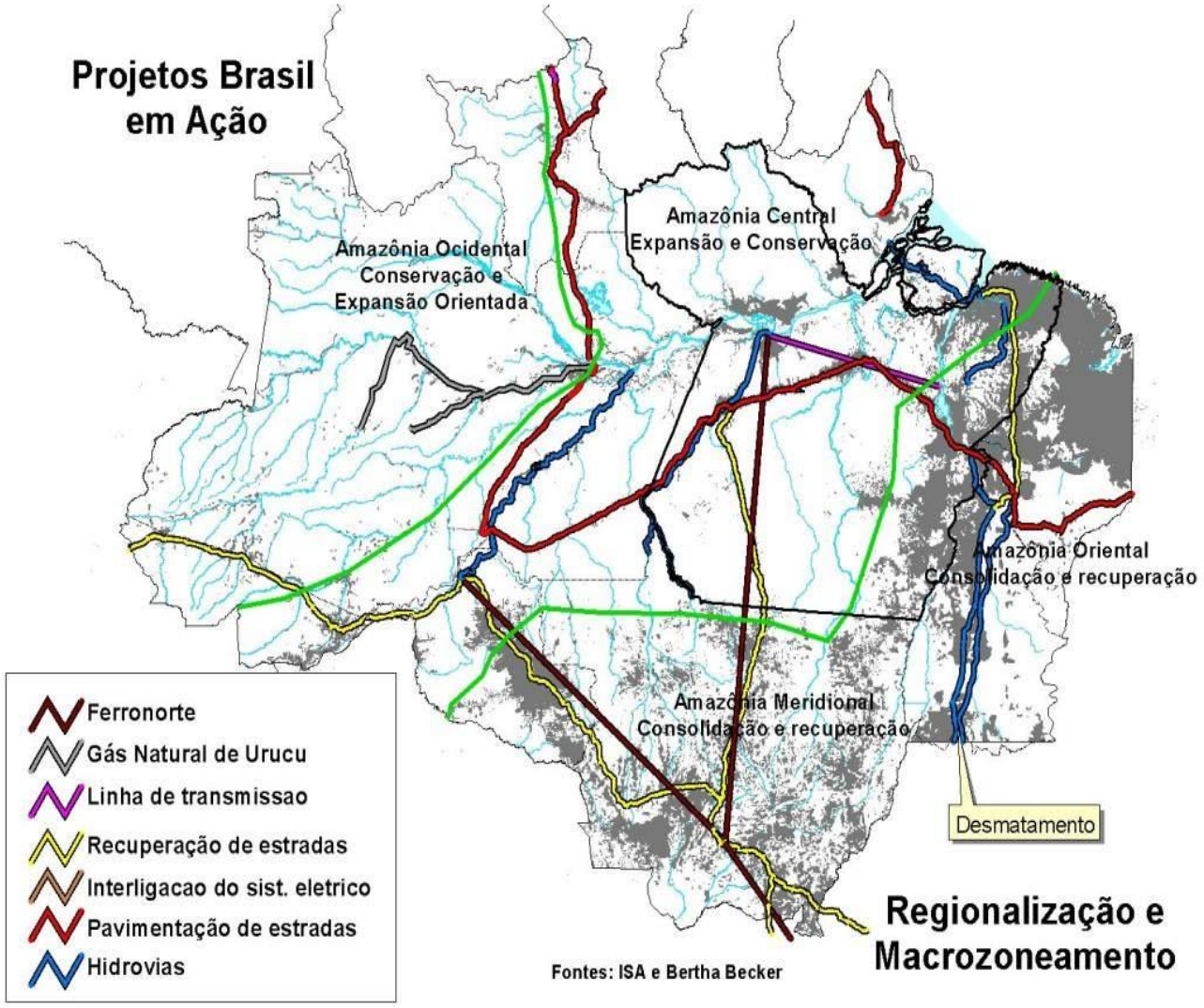

Regionalização e Macrozoneamento

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How to represent reality?

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SuperMap The Innovative GIS Provider

Concept - Abstraction levels

Real world (concepts and measures): lot, soil type
Mathematical model: functions, data models, big data
Computational representations: matrices, vectors

Overview

- *SuperMap's* technological innovation can be found throughout the spatial big data process.
- *SuperMap* GIS fully integrates big data storage management technologies with spatial analysis and real-time streaming, forming a completely new technical Big Data GIS architecture.

Soluções


Cidade inteligente


Gestão de Instalações


Transporte


Gestão de Terras


Recurso natural


Segurança Pública


Conservação da água


Desastres naturais

For spatial big data

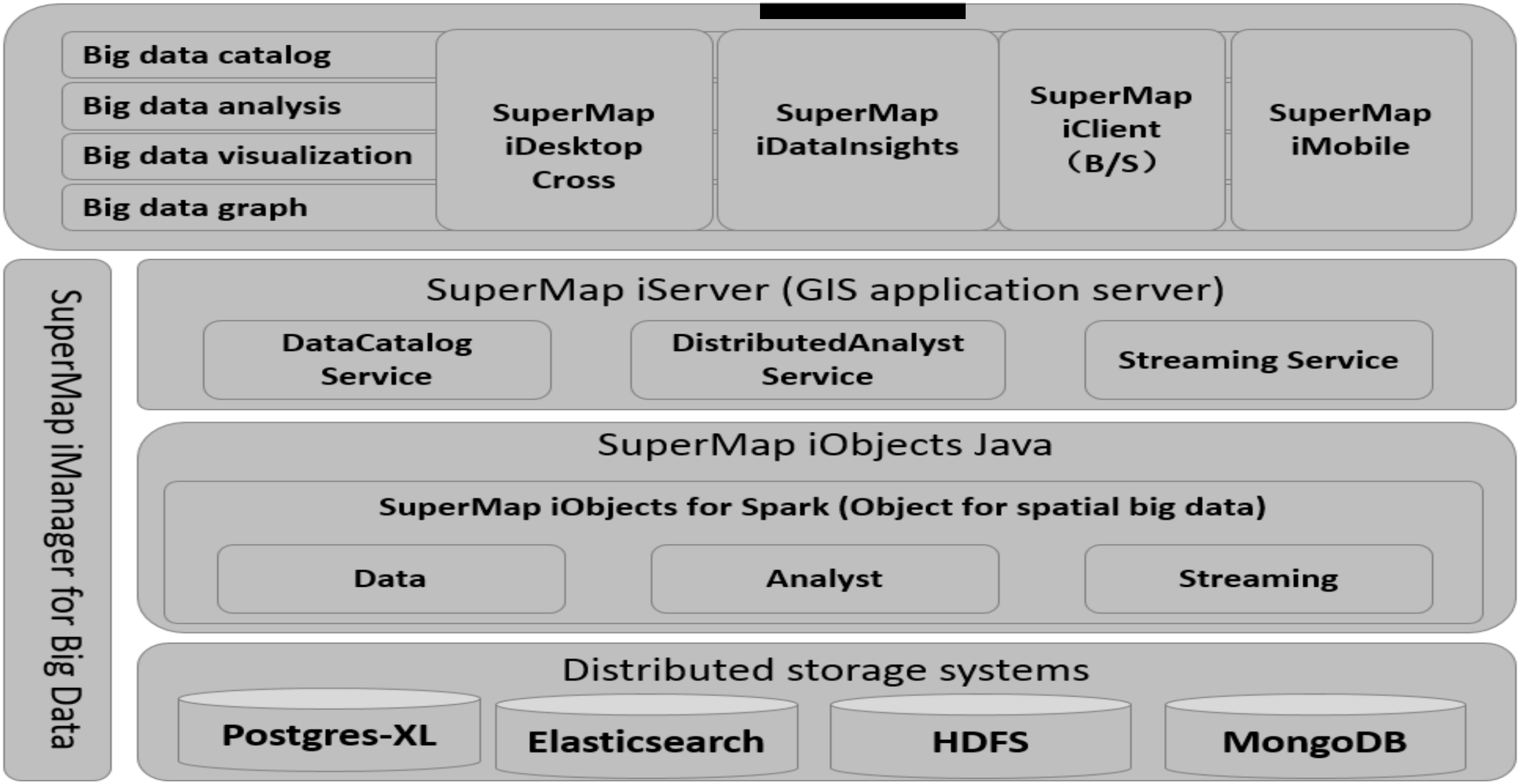
- Big data visualization
- Stream data processing
- Big data spatial analysis
- Spatial big data storage

For traditional spatial data *

- Distributed spatial analysis
- Distributed spatial data processing
- Massive spatial data distributed storage

Supporting technologies

- Cloud GIS
- Cross-platform GIS


Big data catalog
Big data analysis
Big data visualization
Big data graph
SuperMap iDesktop Cross
SuperMap iDataInsights
SuperMap iClient (B/S)
SuperMap iMobile
SuperMap iManager for Big Data
SuperMap iServer (GIS application server)
DataCatalog Service
DistributedAnalyst Service
Streaming Service
SuperMap iObjects Java
SuperMap iObjects for Spark (Object for spatial big data)
Data
Analyst
Streaming
Distributed storage systems
Postgres-XL
Elasticsearch
HDFS
MongoDB

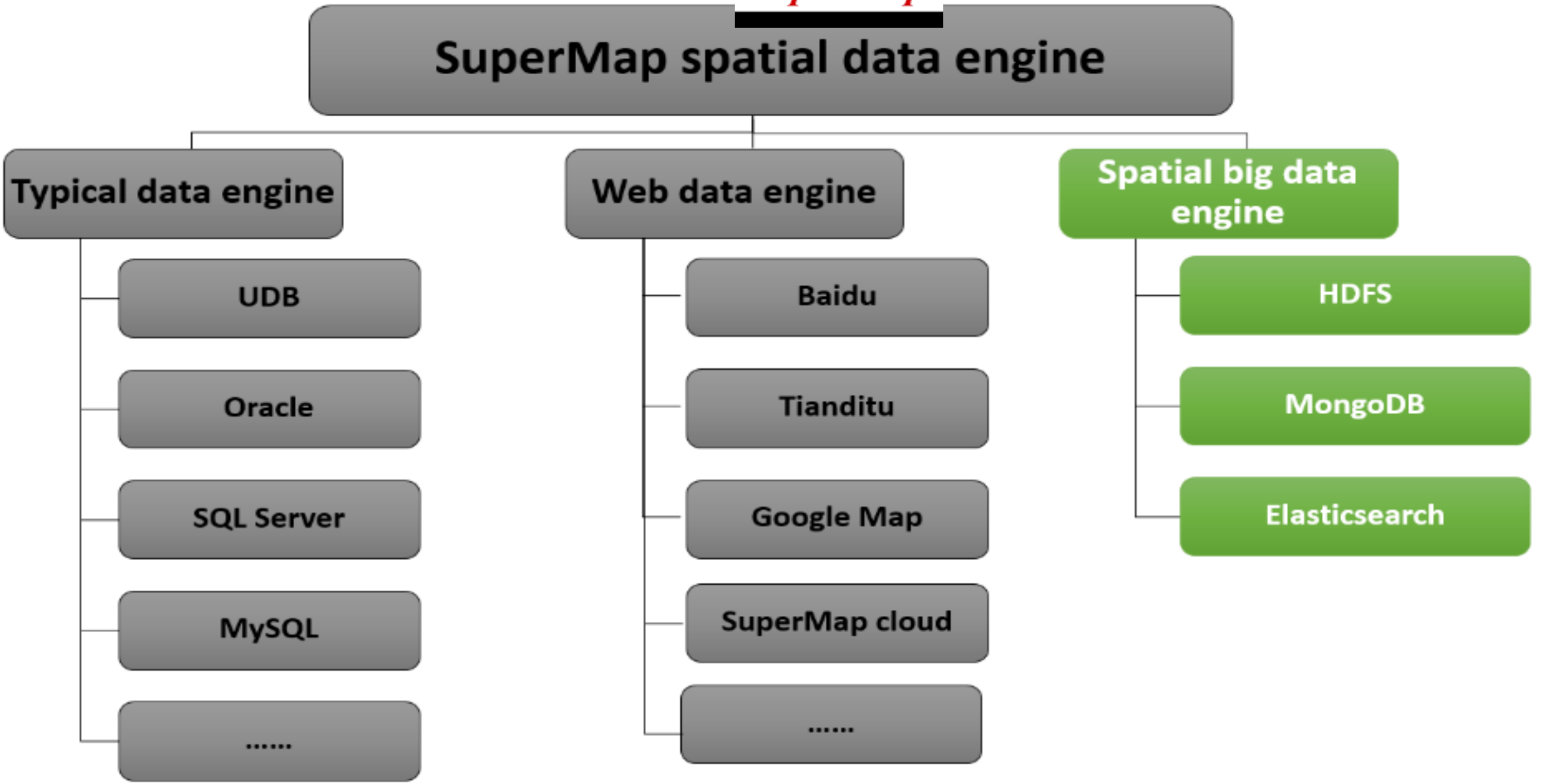
SuperMap GIS 9D Big Data Product Architecture

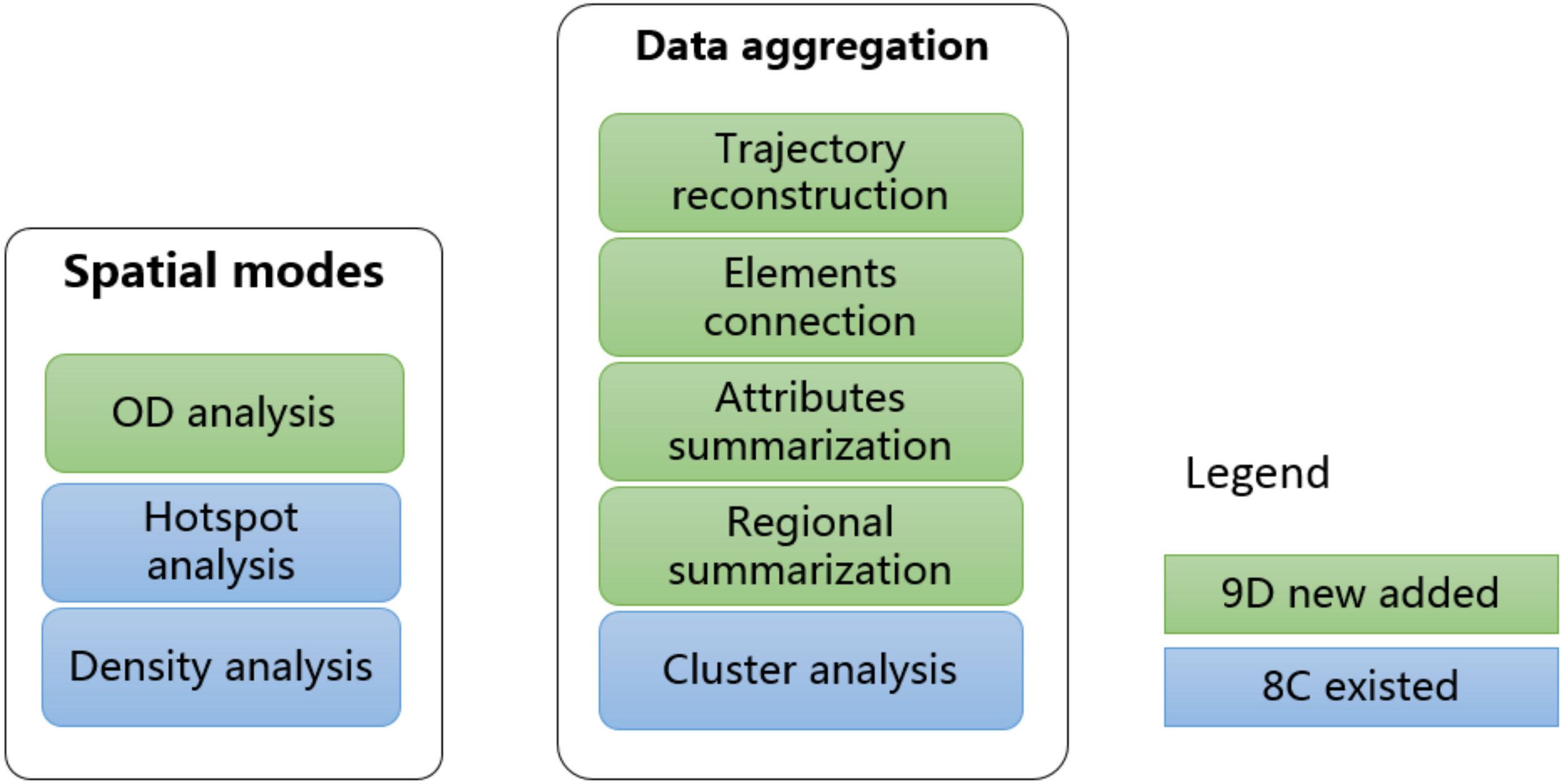
SuperMap GIS performed efficient and stable storage management of big spatial data through the extension for distributed file system, distributed database. Provides the spatial big data component (SuperMap iObjects for Spark), extending the Spark spatial data model from the *SuperMap* GIS kernel, not only reconstructed spatial analysis algorithms that greatly improved the efficiency of spatial analysis, but also developed new algorithms spatial analysis for big data that can be performed directly in Spark, solving the problems of analysis and application of spatial big data;

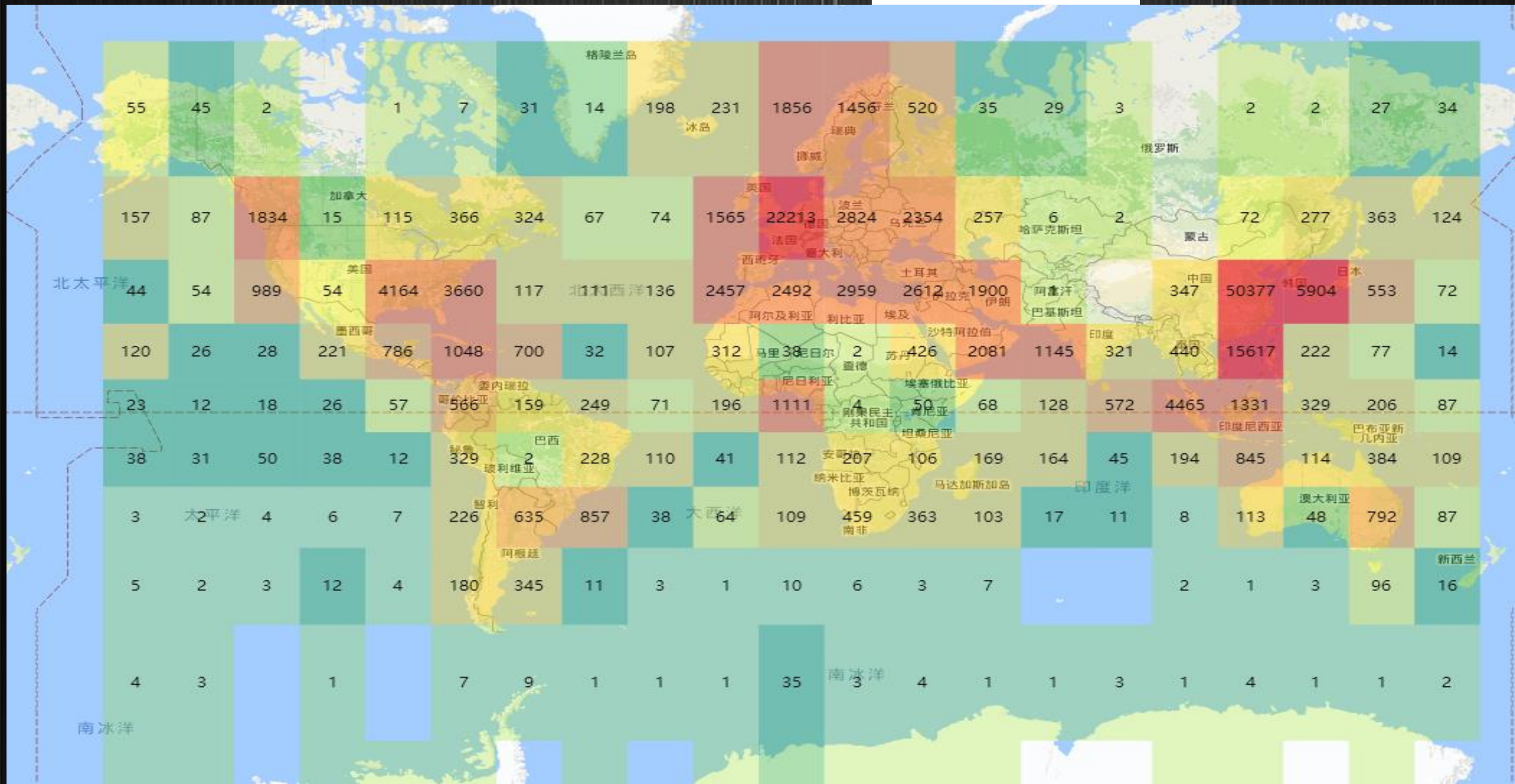
SuperMap iServer provides completely new web services, such as data catalog, distributed spatial analysis, real-time data, etc., and incorporates the Spark execution library, reducing the limit of big data environment deployment;

SuperMap GIS provides several rich 2D and 3D spatial data visualization technologies such as cluster map, density map, relationship map, heat map, etc .;

SuperMap iManager performs maintenance and management of big data through intelligent deployment, automatic mission dispatch, resource monitoring and alarm.


SuperMap spatial data engine
Typical data engine
UDB
Oracle
SQL Server
MySQL
.....
Web data engine
Baidu
Tianditu
Google Map
SuperMap cloud
.....
Spatial big data engine
HDFS
MongoDB
Elasticsearch


Spatial modes
OD analysis
Hotspot analysis
Density analysis
Data aggregation
Trajectory reconstruction
Elements connection
Attributes summarization
Regional summarization
Cluster analysis
Legend
9D new added
8C existed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157 87 1834 15 115 366 324 67 74 1565 22213 2824 2354 257 6 2 72 277 363 124
44 54 989 54 4164 3660 117 111 136 2457 2492 2959 2612 1900 347 50377 5904 553 72
120 26 28 221 786 1048 700 32 107 312 38 2 426 2081 1145 321 440 15617 222 77 14
23 12 18 26 57 566 159 249 71 196 1111 4 50 68 128 572 4465 1331 329 206 87
38 31 50 38 12 329 2 228 110 41 112 207 106 169 164 45 194 845 114 384 109
3 2 4 6 7 226 635 857 38 64 109 459 363 103 17 11 8 113 48 792 87
5 2 3 12 4 180 345 11 3 1 10 6 3 7 2 1 3 96 16
4 3 1 7 9 1 1 1 35 3 4 1 1 3 1 4 1 1 2
格陵兰岛
冰岛
瑞典
挪威
俄罗斯
英国
加拿大
波兰
德国
法国
西班牙
意大利
乌克兰
哈萨克斯坦
蒙古
美国
北太平洋
土耳其
伊朗
阿富汗
巴基斯坦
中国
日本
墨西哥
阿尔及利亚
利比亚
埃及
沙特阿拉伯
印度
委内瑞拉
哥伦比亚
尼日利亚
乍得
苏丹
埃塞俄比亚
刚果民主共和国
肯尼亚
坦桑尼亚
印度尼西亚
巴布亚新几内亚
秘鲁
巴西
玻利维亚
安哥拉
纳米比亚
博茨瓦纳
马达加斯加岛
印度洋
智利
南非
澳大利亚
阿根廷
新西兰
南冰洋

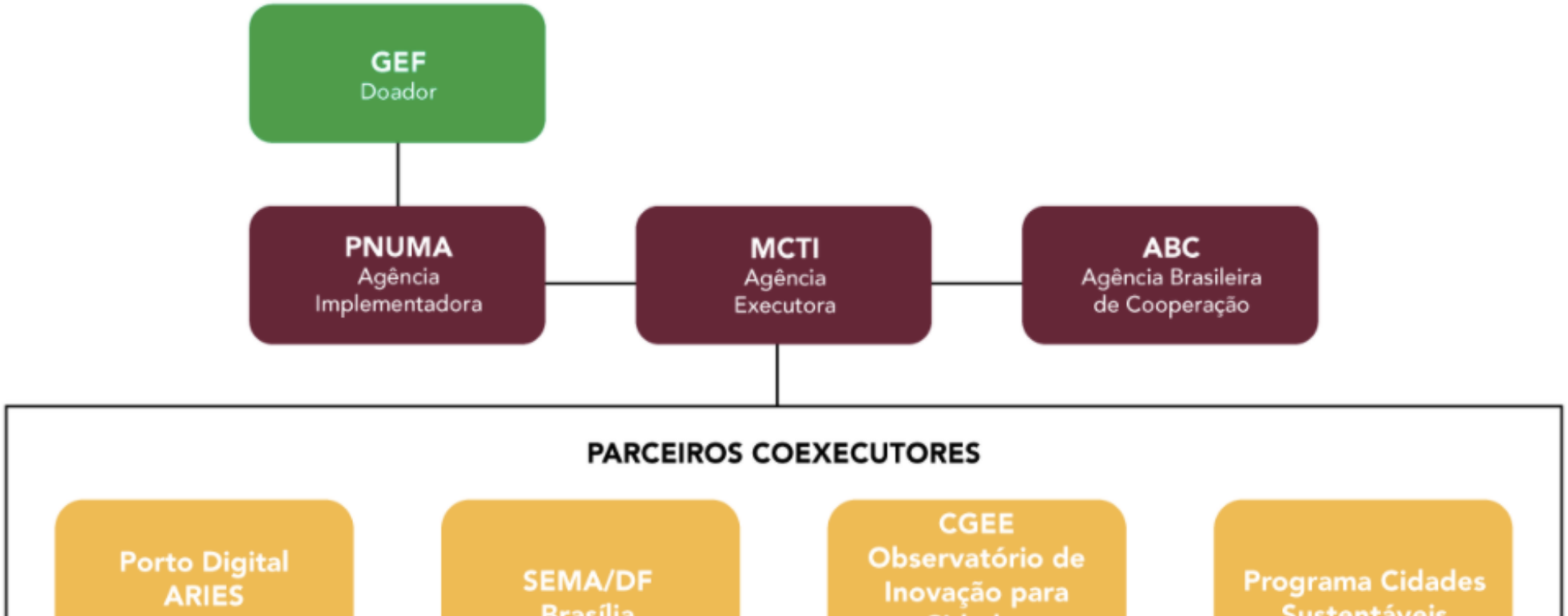
CITinova

项目 知识平台 飞行员 伙伴 新闻

该项目

什么是CITinova?

CITinova是科学，技术和创新部（MCTI）开展的一项多边项目，旨在通过创新技术和综合城市规划促进巴西城市的可持续发展。在全球环境基金（GEF）的资助下，该项目由联合国环境规划署（UNEP）实施，并与累西腓创新与战略署（ARIES）和波尔图共同实施数字，管理与战略研究中心（CGEE），可持续城市计划（PCS）和环境秘书处（SEMA / GDF）。



主要目标是开发创新的技术解决方案，并提供综合的城市规划方法和工具，以支持公共管理人员，鼓励社会参与并促进更公平，更具可持续性的城市。

该项目为期四年，从2018年到2022年，包括三个主要的行动领域：

PLANEJAMENTO URBANO INTEGRADO

INVESTIMENTO EM TECNOLOGIAS INOVADORAS

BRASÍLIA

- Sistema Distrital de Informações Ambientais SISDIA
- Instrumento e Governança para o enfrentamento das mudanças climáticas
- Engajamento Social
- Diagnóstico de contaminaçãodo lixão da estrutural
- Remediação do Lixão da Estrutural
- Recuperação ambiental nas bacias hidrográficas do Descoberto e Lago Paranoá
- Implantação de boas práticas, pesquisas e inovações nas Bacias do Descoberto e Paranoá
- Ações para promoção da energia solar no Distrito federal

RECIFE

- Estratégia de desenvolvimento da cidade
- Micro-estações de Monitoramento Climático
- Política Municipal Habitacional
- Planos Setoriais de Adaptação às Mudanças Climáticas
- Sistema de Gestão Georreferenciada Integrada
- Ações de Urbanização no Rio Capibaribe
- Barco movido a energia solar
- Jardins Filtrantes

综合城市规划

生产知识和工具，用于公共政策和社会参与的综合管理，以在巴西创建可持续发展的城市。新系统可供公共管理人员和整个社会使用，它将协助，促进和加强地方治理。

创新技术投资

巴西利亚和累西腓的试点项目面临着居民和公共管理在水，废物，能源，气候变化和交通领域的历史性挑战。结果将作为一个模型，供全国各地的公共管理人员大规模复制。

知识平台

该网络系统集成了具有更多功能和工具**的可持续城市计划（PCS）**的新平台，以及由战略研究管理中心**（CGEE）**开发的**可持续城市创新观察站**（OICS）。它为公共管理人员和社会提供了一般性内容，方法，指标，良好做法，创新解决方案和技术等等。从试点项目中学到的经验教训也将在平台上。

MCTI的培训和战略行动政策秘书处（SEFAE）的气候总协调（CGCL）负责执行CITinova项目，CITinova项目的资金来自GEF的2500万美元，对应的为1.95亿美元。所涉及的合作伙伴机构提供的美元。

全球环境基金

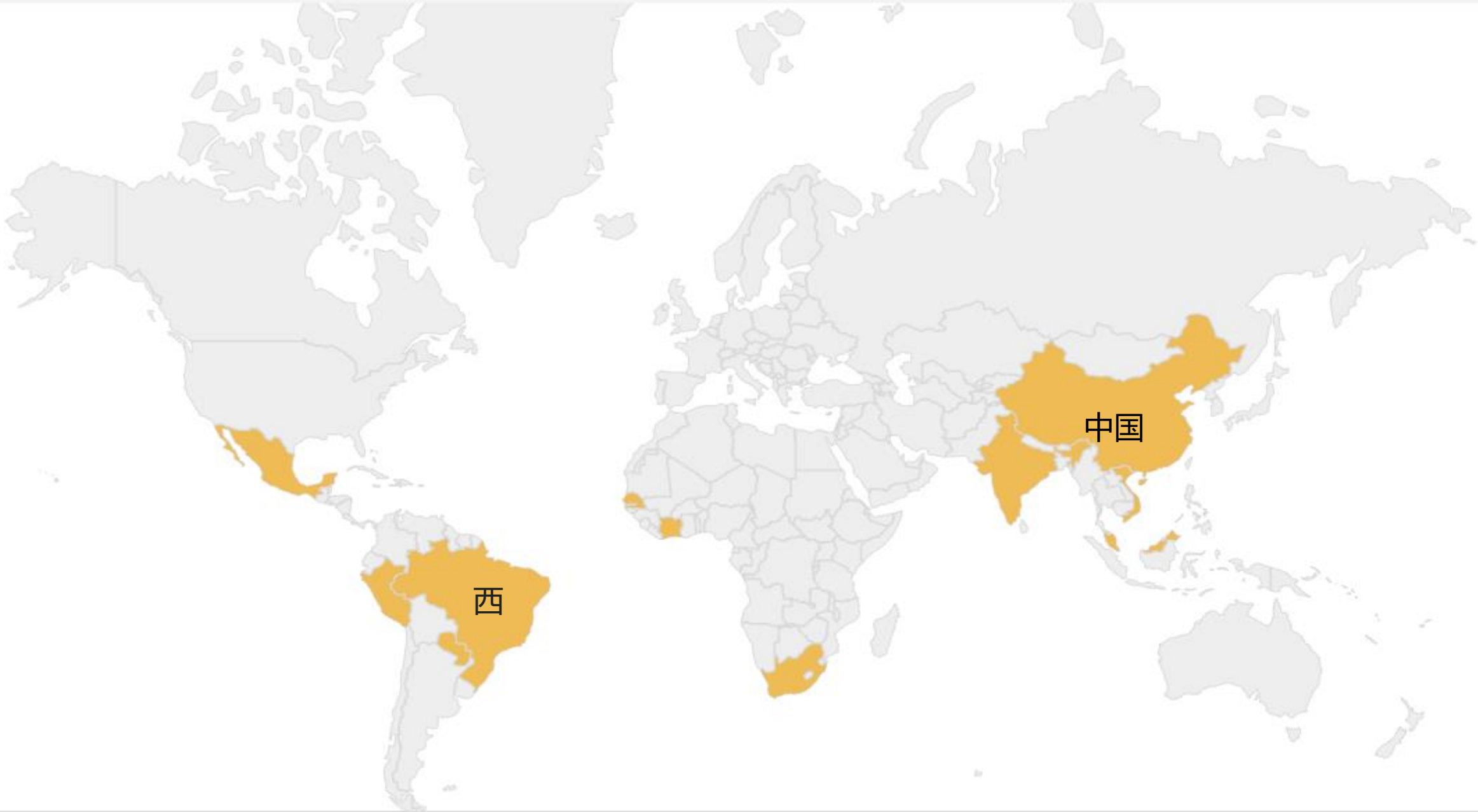
（GEF-全球环境基金）是联合国（UN）和世界银行在里约热内卢ECO-92设计的一种筹资机制，旨在支持全球各国政府和组织的联合项目。

自1992年以来，全球环境基金通过结构化的全球方案为170个国家/地区的4,500多项计划提供了资金，重点关注气候变化，水，废物，土地利用和生物多样性等。

全环基金第六次增资行动计划

这是基金专门为发展中国家的城市设立的一个方案，其目的是塑造和加强系统和综合的城市空间规划方法。

CITInova可持续城市综合规划和技术项目在包括巴西在内的28个城市和11个发展中国家开展。


中国
西

- **Thank You!**
  elisiqueira@unb.br
  LinkdIn – Eli Siqueira ALVES
  WeChat – Eli Brasília
  +55 61 98215-8240