



生态文明导向的广州国土空间规划实践

Ecological Civilization Oriented Territorial Space Master Plan:
Exploration and Practice in Guangzhou

LI XIAOHUI

GUANGZHOU URBAN PLANNING & DESIGN SURVEY RESEARCH INSTITUTE

2022.4



广州: 北回归线上的超大城市

Guangzhou is one of the mega-cities on the Tropic of Cancer

气候与地理条件优越, 人口经济高度集聚

Superior on location and climate

Population and economy are highly concentrated

广州
Guangzhou



Tropic of Cancer

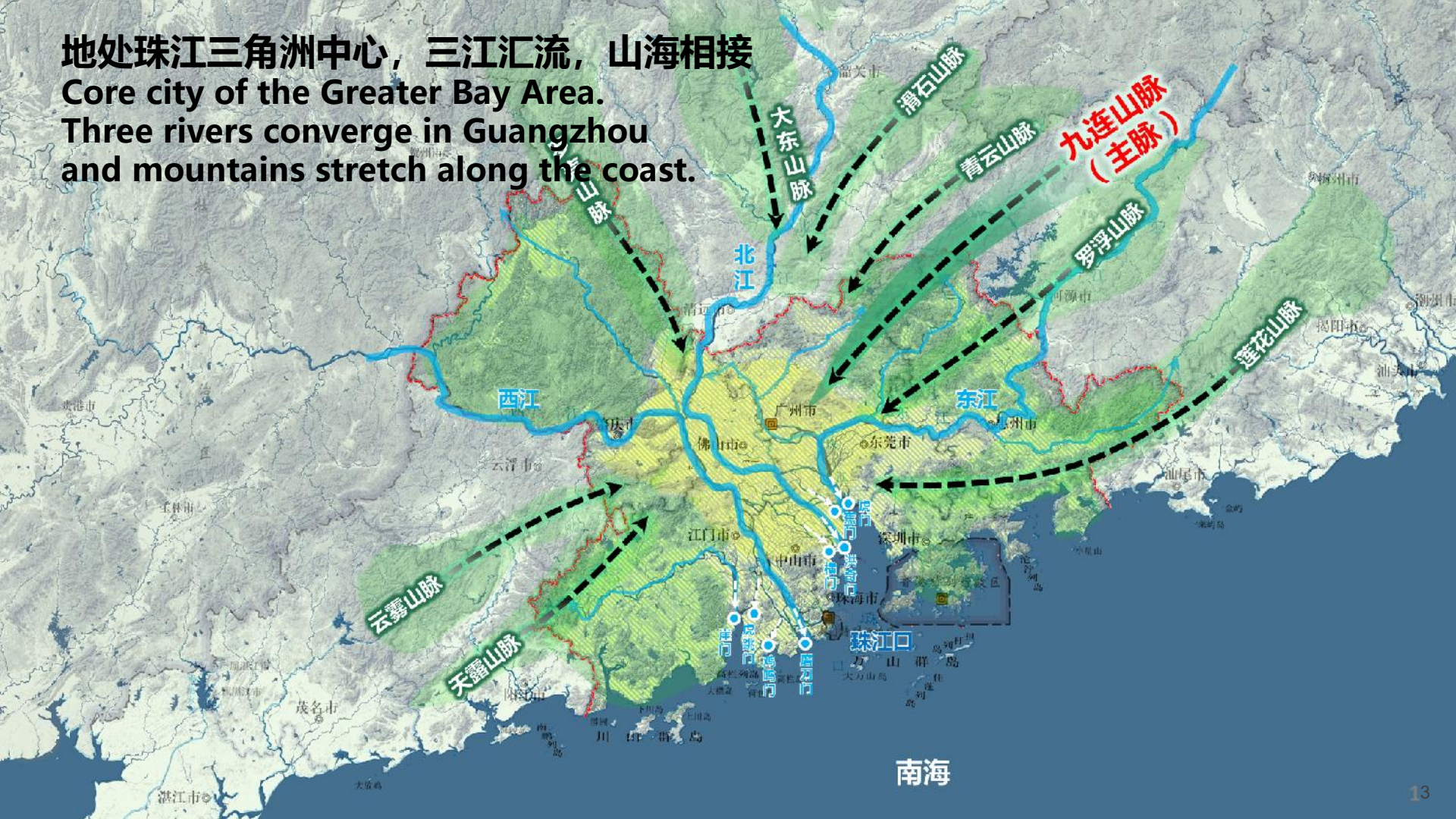
Equator

Tropic of Capricorn

Pop: 18 million

GDP : US\$435 billion

地处珠江三角洲中心，三江汇流，山海相接
Core city of the Greater Bay Area.
Three rivers converge in Guangzhou
and mountains stretch along the coast.



南海

城市选址及建造秉承中国古代山水城市营建思想

The construction of the city inherited the tradition of ancient landscape



山水城田海的空间格局

Natural and urban layout of Guangzhou



市域面积 (City Area) **7434**km²

山地丘陵(Hilly Area) **50%**

平原(Plain) **40%**

水域(Water Area) **10%**, 河流河涌(Rivers) **1300**多条

适宜的气候与多样的生境造就优越的生态禀赋

Suitable climate and diverse habitats

- 亚热带季风气候，年均气温22℃，年均降雨量超过1900毫米，维管束植物1813种
- Subtropical monsoon climate, average annual temperature of 22℃, annual rainfall of more than 1900 mm, Vascular plants 1813



超大城市面临的共同的生态风险与问题

Typical challenges of Megacity

资源能源消耗

Over-consumption of energy
and natural resources

- Urban Expansion
- Increasing energy consumption

生态系统退化

Ecosystem degradation

- Loss of habitats
- Exaggerating risk of ecological pollution

气候风险增多

Climate risk increasing

- Sea-level rise and storm caused by climate change
- Threat of Urban Heat Island Effect
- Extreme events such as rainstorm and heat wave

如何保护好生态资源禀赋，建设更加安全、健康、宜居的城市？

How can we build a safer, healthier and more livable city based on the nature?

人口经济持续增长的
挑战

Increasing population and
economic growth

人民日益增长的对美好生
态环境需求的挑战

People's demand for a better
ecological environments

气候变化对城市安
全的挑战

Climate change and
adaptation



引领
深化实践
生态文明思想

Practice on
Ecological Civilization

核心
促进人与自然
关系协调

Balance between
human and nature

途径
优化国土空间
开发保护

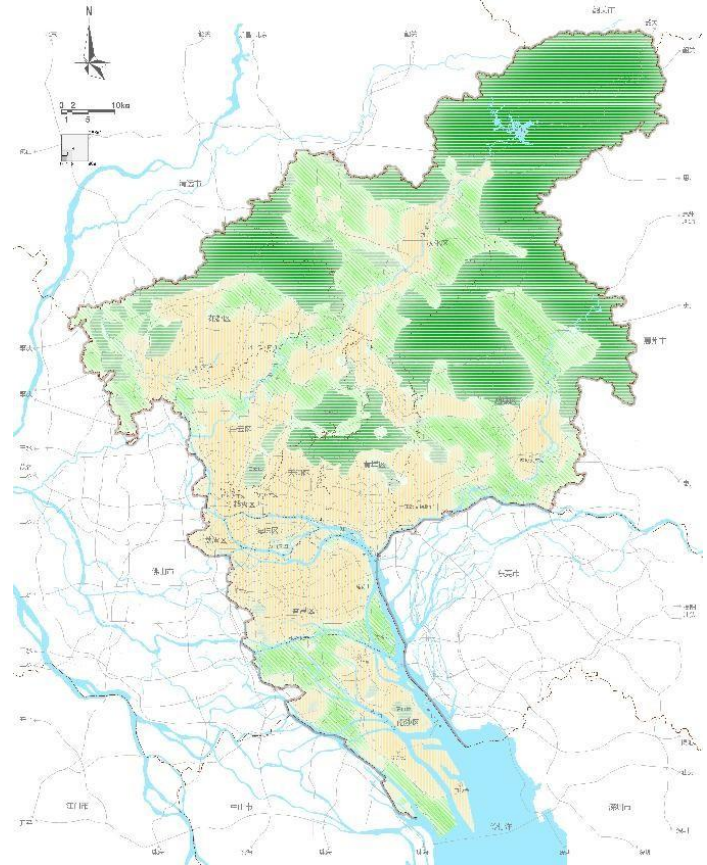
Land use and
territory planning

科学评估，框定发展底线和极限

Evaluation to identify bottom line of urban development

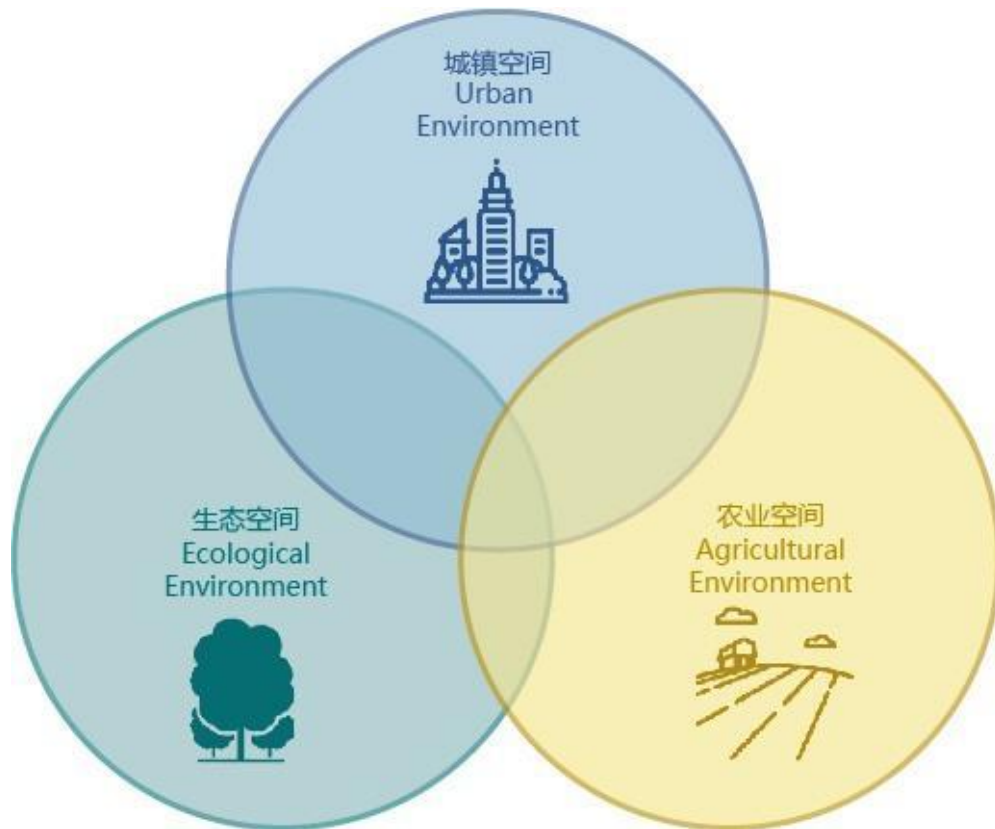
Suitability evaluation of land on ecological conservation, agriculture and urban development

- Ecological and agricultural space should not be less than $\frac{2}{3}$ of the municipal area
- The urban space shall not exceed $\frac{1}{3}$ of the municipal area



形成共生共融的生态、农业、城镇空间格局

Form a harmonious spatial pattern that integrates ecological, agricultural and urban spaces



生态空间

Ecological space

尊重自然、保护自然、顺应自然，保护生态系统稳定

Respect nature, maintain ecosystem stability

开展多维生态评估

Multi-dimensional ecological assessment

流域生态风险与安全评估

Watershed ecological risk and security assessment

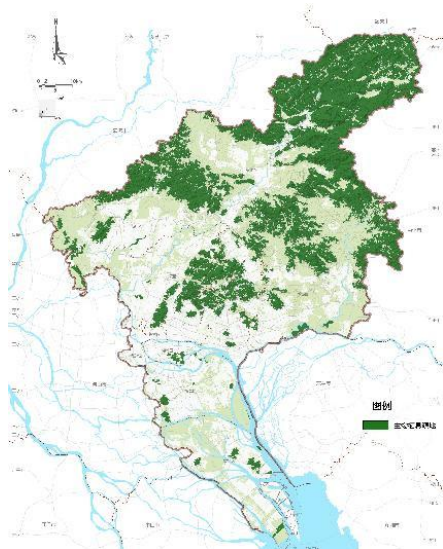
强化市域面积**15.1%**的洪涝风险地区保护, 加强**20余处湿地、湖泊与水源地**等流域重要生态功能区管控

生物多样性保护评估

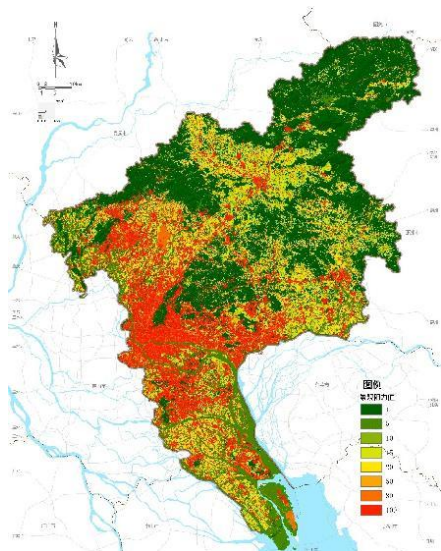
Biodiversity conservation assessment

开展生物“栖息-迁徙”过程模拟, 识别**86处**适宜生态源地与**174条**生物通廊。

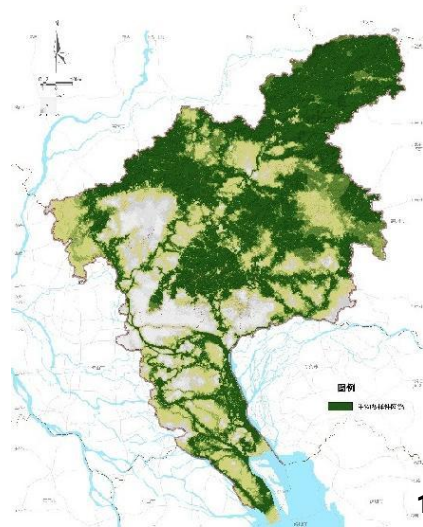
The "roost-migration" process was simulated, and 86 suitable ecological source areas and 174 biological corridors were identified.



生境适宜性评价



景观阻力面



识别生态迁移廊道

划定生态保护红线

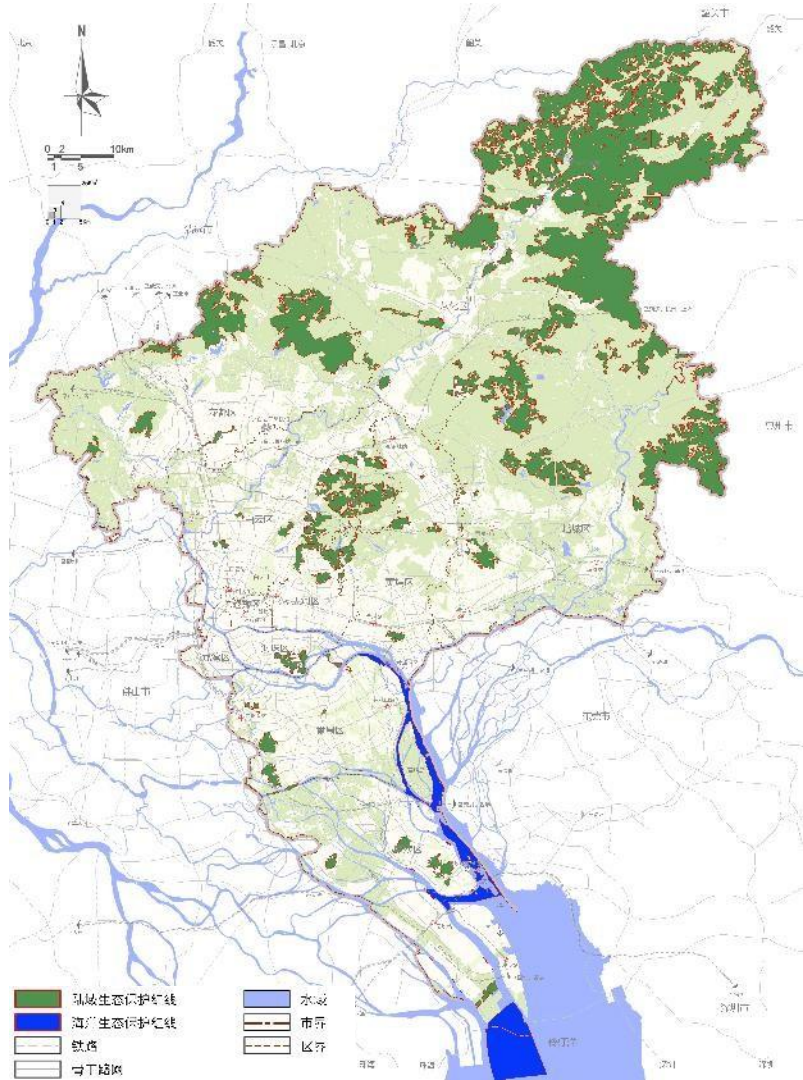
Delimit the Ecological-Red-Line

严格保护生态功能极重要区域

Areas with high ecological importance shall be strictly protected

纳入自然保护地

natural reserve



构建具有岭南特色的自然保护地体系

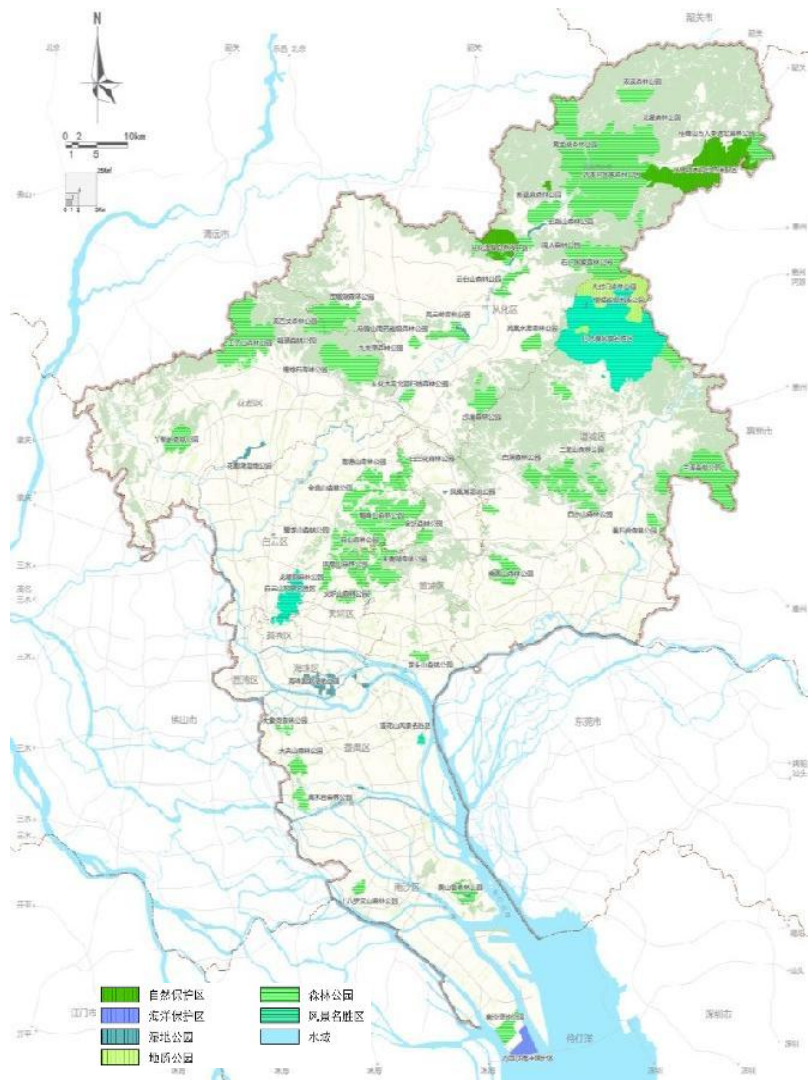
Establish a protected areas system



5↑
Natural
Reserve



73↑
Natural
Park



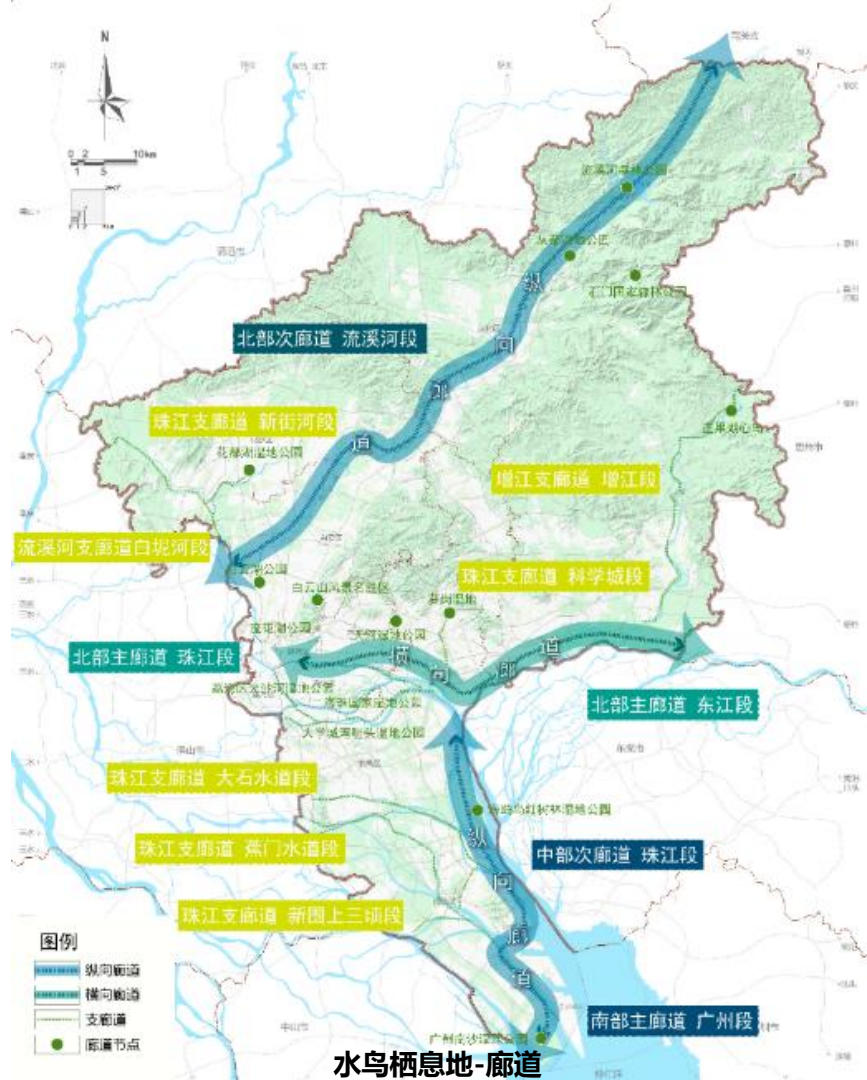
打造环城生态游憩带

To create a green ring around the city
ecological recreation belt



注重生物多样性保护维育 Biodiversity Conservation

保护修复水鸟栖息地和鸟道 Protect habitats and flyways of waterfowls



修建鱼道

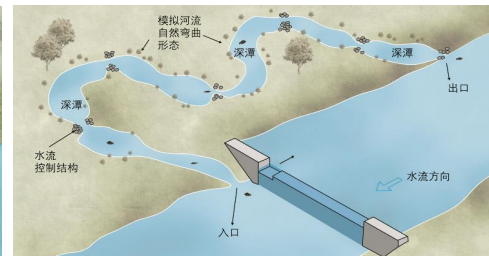
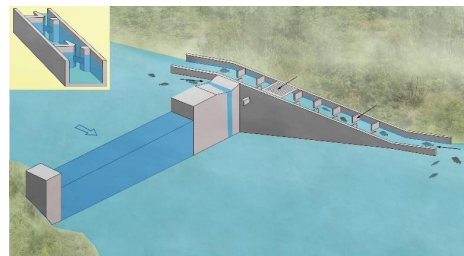
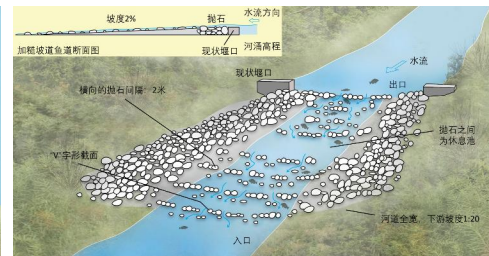
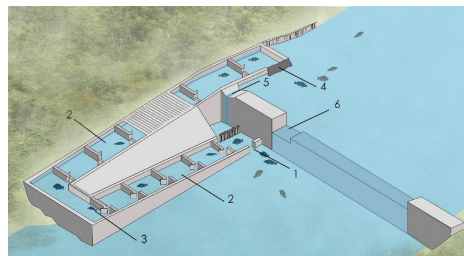
Dredge fishway



Tanichthys Albonubes
Rare species in China



Guangzhou Conghua Tanichthys
Albonubes Reserve



Fishway

城央湿地：海珠国家湿地公园，打造人与自然共生的生命共同体

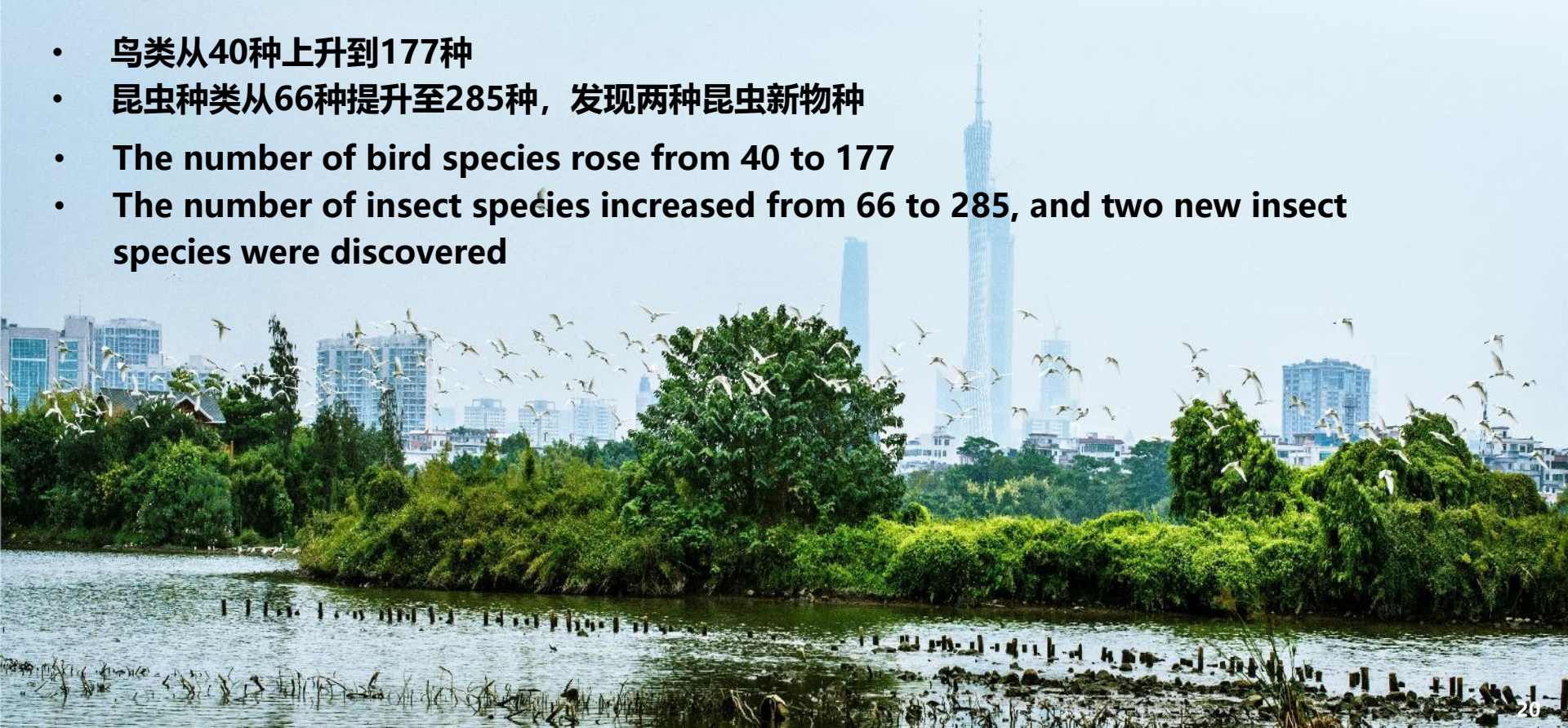
Haizhu Wetland: Build a Community Man and Nature coexist in harmony



生物多样性不断提升

Biodiversity is gradually recovering

- 鸟类从40种上升到177种
- 昆虫种类从66种提升至285种，发现两种昆虫新物种
- The number of bird species rose from 40 to 177
- The number of insect species increased from 66 to 285, and two new insect species were discovered





海珠湿地观鸟平台-静静观鸟的市民
Haizhu Wetland Bird Observation Platform

提升多样化的生态服务

Provide diversified ecological services



建成云道串联8大中心城区公园

The *Cloud Path* connecting 8 parks



规划建设2000公里碧道，为市民提供多样化的滨水游憩空间

2000km green-river paths system



海岸线整治修复，提升滨海景观质量

Carry out coastline restoration to improve the quality of coastal landscape



农业空间

Agricultural space

打造岭南新田园，发展都市农业

Build new agricultural space in urban areas

划定14个永久基本农田集中区

Permanent farmland protection area



推动建设都市农业公园

Construct urban agriculture park



黄埔区大吉沙岛水稻公园整治项目

Agricultural park improvement project



保护和恢复农田，提高粮食产能约 2.4万公斤

Protect and restore farmland, increase production capacity 24,000kg



成为城区居民周末休闲重要目的地

Become a leisure destination for urban residents

A young child wearing a straw hat and a colorful, patterned raincoat is bent over, planting rice seedlings in a muddy field. The child is holding a bundle of seedlings in their left hand and is using their right hand to place a seedling into the soil. The background shows other people, some holding umbrellas, and modern buildings in the distance, suggesting an urban setting. The scene is outdoors and appears to be a community or educational activity.

广州海珠一方乐田-体验“下田”的儿童
Urban agriculture: child experiencing planting

城镇空间

Urban space

以人为中心，聚焦城市结构优化与人居品质提升

People-centric city with urban quality improvement

广州未来将进入**存量为主、增存结合**发展阶段

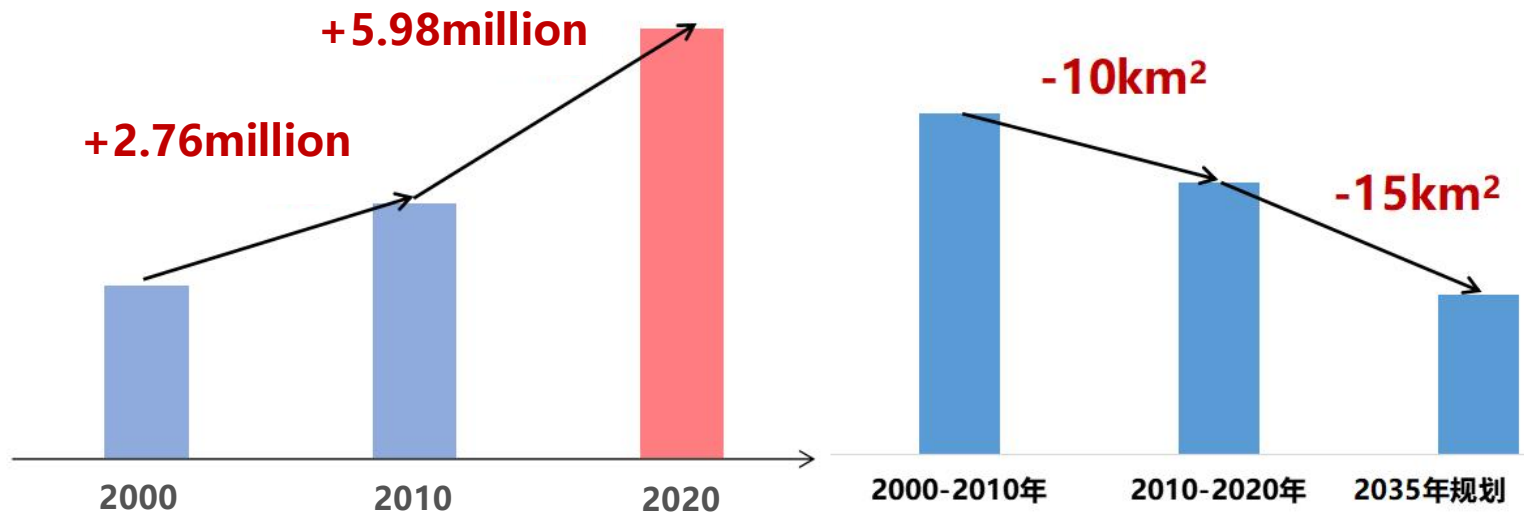
Guangzhou is entering a new phase of urban regeneration

优化建设用地配置：用好有限新增规模，积极盘活存量低效用地

Allocation of additional and stock land resources

结合城市更新优化功能结构，提升民生服务与生态品质

Improve habitation and well-being in urban regeneration



Permanent population of Guangzhou

Change of urban land since 2000

在城市改造中建设口袋公园，见缝插绿

Build pocket parks, infill with green space



推动“存量立交、净水厂、公交场站”三类立体化利用

Mixed-use of overpasses, water treatment plants and public transport stations

存量交通设施立体化利用

Multiple use of stock traffic facilities



净水厂市政设施立体化利用

Multiple use of Water purification plant municipal facilities



公交场站用地立体化利用

Bus station oriented development



净水厂综合开发 (沥滘净水厂)

Mixed-use development of Lijiao water treatment plant



净水厂地下化，建设公园、科研办公等设施，打造“七合一”水务创新技术中心

东圃立交上盖

The garden on top of Dongpu overpass



与世界银行共同推进广州“酷城”行动

Work with the World Bank, promoting urban cooling actions

- China cooperated with the World Bank to launch the first pilot project of the “China Sustainable Urban Cooling Pilot Project in Guangzhou”.
- Efforts should be made to improve the climate comfort and livability of cities, and climate-friendly schemes for subtropical megacities should be explored.



世界银行驻华代表处
World Bank Office, Beijing

February 19, 2020

Guangzhou Municipal Government
People's Republic of China
Fax: 86-20-83340347

China Sustainable Urban Cooling Pilot Project in Guangzhou

On behalf of the World Bank, I am pleased to inform the Municipal Government that Guangzhou has been selected as pilot city for a World Bank funded China Sustainable Urban Cooling Project. This project, which was approved by the World Bank's Energy Sector Management Assistance Program (ESMAP) late last year, aims to (i) assist the city of Guangzhou to identify cooling strategies to be incorporated into urban planning; (ii) carry out pilots in the selected sites; and (iii) help share the experience and knowledge with cities in China and other countries. The specific activities to be financed are included in the annex to this letter.

The proposed work directly links to the ongoing preparation of a World Bank's technical support program to China on sustainable cities, which includes components on land use planning to address urban heat island effects. This program includes the establishment of a knowledge exchange platform connecting cities in China and around the world. It is our hope that the work to be carried out in Guangzhou will provide valuable insight to be shared on this platform.

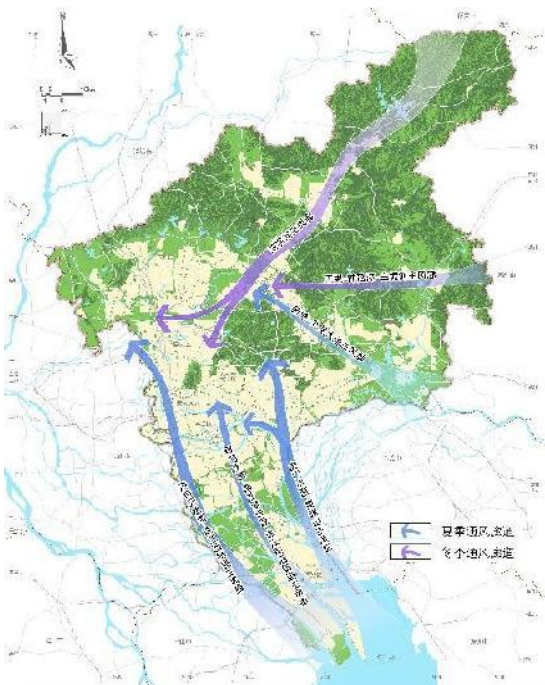
We are excited about working with the city of Guangzhou and looking forward to strengthening our collaboration.

Yours sincerely,

Francis Ghesquiere
Practice Manager
Urban and DRM (East Asia and the Pacific)
Social, Urban, Rural and Resilience Global Practice

构建多级通风廊道，促进自然通风与空气流动

Multi-stage ventilation corridors are constructed to promote air ventilation



白云新城迎风控制区：
 多条廊道交汇点，将白云山冷空气引入西部地区的核心节点，应重点开发建设的强度与形态控制。
 • 保留区内飞翔公园至前湾的低层低密建设模式；
 • 开发强度应向山前地区递减；
 • 应构建并保留与白云山垂直的通道。

白云山及帽峰山气源地：
 冷空气来源，严格控制开发

东郊生态廊道迎风控制区：
 除了洋一帽峰山主通风廊道地区，高联帽峰山、龙头山等冷源，应保障其密度、开敞性，限制大型开发，小型节点式开发应遵循以下要求：
 • 规划方案应进行风环境专项评估，尽量减少影响该区域的气候特性；
 • 尽量增加绿化及开敞空间；
 • 尽量减少硬质地面。



一江两岸迎风控制区：
 中部地区的上风风廊道地区，同时也是城市开发重点地区，应着重考虑建筑形态控制，保留风道。
 • 不允许屏风建筑；
 • 河流周边建筑应顺应主导风向，控制建筑间距和建筑高度差；
 • 建设垂直河岸的绿色开敞空间，加强通风渗透。

万亩果园及大学城迎风控制区：
 狮子洋东南风注入城市的主要入口，应限制开发。
 • 万亩果园限制开发，向北中以次级通风廊道；
 • 大学城控制东南-西北主导风道，严控增量。

化龙湿地-莲花山-海鹞岛强风利用区：
 冷空气来源，应保持开敞性

实施三个示范项目，研究促进城市降温的技术方法

Explore the techniques of ventilation through urban cooling pilot project



Yongqingfang Regeneration

In plot and building
scale

Urban regeneration



China-Singapore Knowledge City

In block scale
New town development



Haizhu Wetland

In city scale
Natural resources



制定促进城市通风降温的政策措施

Policies to promote urban ventilation and cooling

Issue the urban cooling strategy and planning guidelines of Guangzhou



广州市规划和自然资源局关于印发《在城市更新工作中大力倡导可持续发展城市降温的规划建设指导意见》的通知

局机关各处室、局属各单位、各区分局：

为深入践行习近平生态文明思想，全面贯彻“创新、协调、绿色、开放、共享”发展理念，响应国家碳达峰、碳中和目标，积极应对全球气候变化，结合我市城市更新工作，推动广州可持续发展城市降温“酷城”行动，提升城市气候舒适性，我局制定了《在城市更新工作中大力倡导可持续发展城市降温的规划建设指导意见》。经广州市规划和自然资源局2021年第9次局长业务会议审议通过，现予以印发，请参照执行。执行中遇到的问题，请向总体规划处反映。



水网融城、森林入城、耕地护城、海洋亲城

Waterways, forests, farmlands, coasts growing in the city





谢谢!
Thanks

