

五大湖：
环境与经济

Great Lakes:
The Environment and the Economy

SOM城市设计实践团队
SOM City Design Practice

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摘要

位于美国和加拿大之间的五大湖-圣劳伦斯流域拥有占地球上20%的地表淡水资源，哺育着拥有5 000万人口的特大都市群。在过去4年多的时间里，SOM城市设计实践团队为该流域的环境恢复和经济复苏勾勒了一幅未来百年的全景。“五大湖百年愿景”项目具有在生态系统尺度下展开规划的先锋视角，为区域甚至是全球的人口增长和城市化过程提出了战略性管理建议。SOM通过这一项目倡导人与自然和谐共赢的愿景；在SOM合伙人菲利普·恩奎斯特的提议与领导下，该项目对这片广阔地区的资源与脆弱性进行了研究，制定了富有远见的转型策略，并面向政府、学术界、环境保护组织以及公众进行了有力的展示。该项目创造了这一区域所亟须的、具有统一性与整体性的美-加双边合作视角。“五大湖百年愿景”的创新性策略已得到美国多个城市设计与景观最高奖项的认可。

关键词

五大湖；环境；经济；两国；百年愿景

Abstract ...

The U.S.-Canadian Great Lakes and St. Lawrence River basin holds 20 percent of earth's surface fresh water and sustains a megalopolis of 50 million people. For more than four years, the City Design Practice of Skidmore, Owings & Merrill (SOM) has pioneered a holistic, 100-year vision for the basin's environmental restoration and economic renewal. The Great Lakes Century pioneers an ecosystem-scale planning perspective and suggests strategies for managing not just regional growth but global population growth and urbanization. SOM calls for a vision that balances humanity and nature for the good of both. SOM partner Philip Enquist leads the initiative that researched the vast region's vulnerabilities and assets, defined visionary turnaround strategies and created powerful presentations to government, academic, environmental and public audiences. It created what was missing: a unifying and overarching bi-national perspective. Its innovative approach has been recognized by America's highest urban design and landscape architecture awards.

Key words ...

Great Lakes; Environment; Economy; Bi-national; 100-year Vision

环境 和经济一直以来相互依存——俱荣俱损。纵观历史，城市总是建立在水源丰沛、土地肥沃、自然资源易得的环境富庶之地。然而，自工业革命以来，呈爆炸性增长的城市人口不断地向赐予城市生命的环境排放越来越多的有毒废弃物。这里，将为你讲述一家国际设计事务所为促进一个20世纪的大型工业生态系统的环境恢复和经济复苏，从而为其提出发展愿景的故事。

由于过去150年间该地区无可匹敌的工业增长和创新，位于美国和加拿大之间的广阔的五大湖-圣劳伦斯流域常常被称为“碳经济的摇篮”。然而直到最近几十

年，我们才开始逐渐意识到这一地区历史上的成功所付出的环境代价——事实上，至今我们仍未将这种代价纳入支持当今消费生活方式的经济体系中。我们的世界再也无法以“进步”的名义掠夺其生态系统，尤其是在本世纪全球人口急剧膨胀和城市 化超速发展的背景下。

由SOM城市设计实践团队所创立的战略性的“百年愿景”倡议，为拥有5 000万人口的特大都市群——该地区拥有全球20%的地表淡水资源和北美80%淡水资源——提出环境恢复和区域更新策略。该项目作为公共事业发展至今已步入第5个年头。即使当这一地区曾主导的消费性产

品制造业已大部分转移到了包括中国在内的其他地区，跨越美加两国的这一区域仍保持着4.5万亿美元的经济产出。SOM的“五大湖百年愿景”起源于一系列基于对未来发展的乐观态度所进行的诚实求是的评估，即人类发展的足迹是如何持续毒害自己赖以生存的环境。

在SOM全球设计合伙人菲利普·恩奎斯特富有远见的倡导下，这一项由城市规划师组成的自愿者团队所进行的环境现状评价，是一个意料之外的创意性尝试。该项目的主要参与者之一是一位拥有地理学背景的规划师；即便对他而言，当面对美国、加拿大联邦及魁北克省不尽相同的记

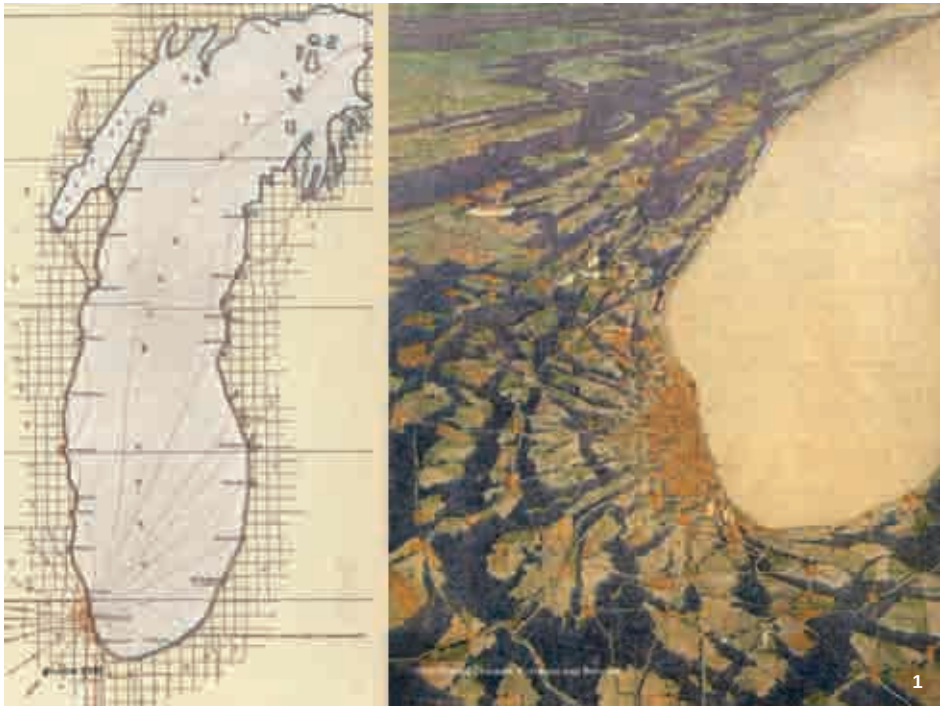
录方式，进行跨境地图与统计数据的统一与协调工作也充满挑战。

通过卫星影像和GIS计算该流域的土地利用状况——42%的森林、33%的地表水、21%的农业用地和4%的城市用地——尚属相对轻松的工作；而清点该地区的15 000个府单位、标记该地区所有水电站、核电站和燃煤发电站则是极为繁杂的工作。通过互联网可在很短时间内确认180多种入侵并改变该流域水体环境的水生物种；而花费一定时间进行图解信息也是项有趣的工作：若将这一巨大的河水系加在欧洲地图之上，则跨越了由伦敦延伸至马赛、再由诺曼底延伸至华沙的空间；而该流域17 702km长的水岸线，则相当于美国芝加哥与澳大利亚珀斯之间的距离。

对关注全球各个城市地区的设计师而言，污染的城市雨水径流、生活污水溢流和工业废水排放是众所周知的问题。但对农业径流所带来的极大破坏进行评估——事实上，农业径流被证实是“泊杀手”——对于SOM的城市规划师来说则是一项全新挑战。一系列对专业储备进行的统计学数据的挖掘，引发了SOM在这一倡导中的关键点：通过对各自分离的专业领域进行跨界思考，将该流域看作是经过整合的系统——它既包括各方所面临的共同问题，又决定了其共同的未来——从而提出一个全面的未来发展愿景。

“五大湖百年愿景”为该地区提出了一个自我认知的崭新途径。该项目也展现了一种全新的生态系统尺度的视角——SOM认为规划师、决策者和府官员应透过这一视角看到自己在本世纪的城市和特大城市区域中担负的责任。为表彰这一公益性项目的突破式构思，美国最重要的设计组织——美国景观设计师协会（ASLA）和美国建筑师学会（AIA）——将他们的最高国家奖项授予了该项目。而菲利普·恩奎斯特在项目第一年进行百年愿景号召时，便获得了超过100位加拿大和美国城市市长的通力支持。

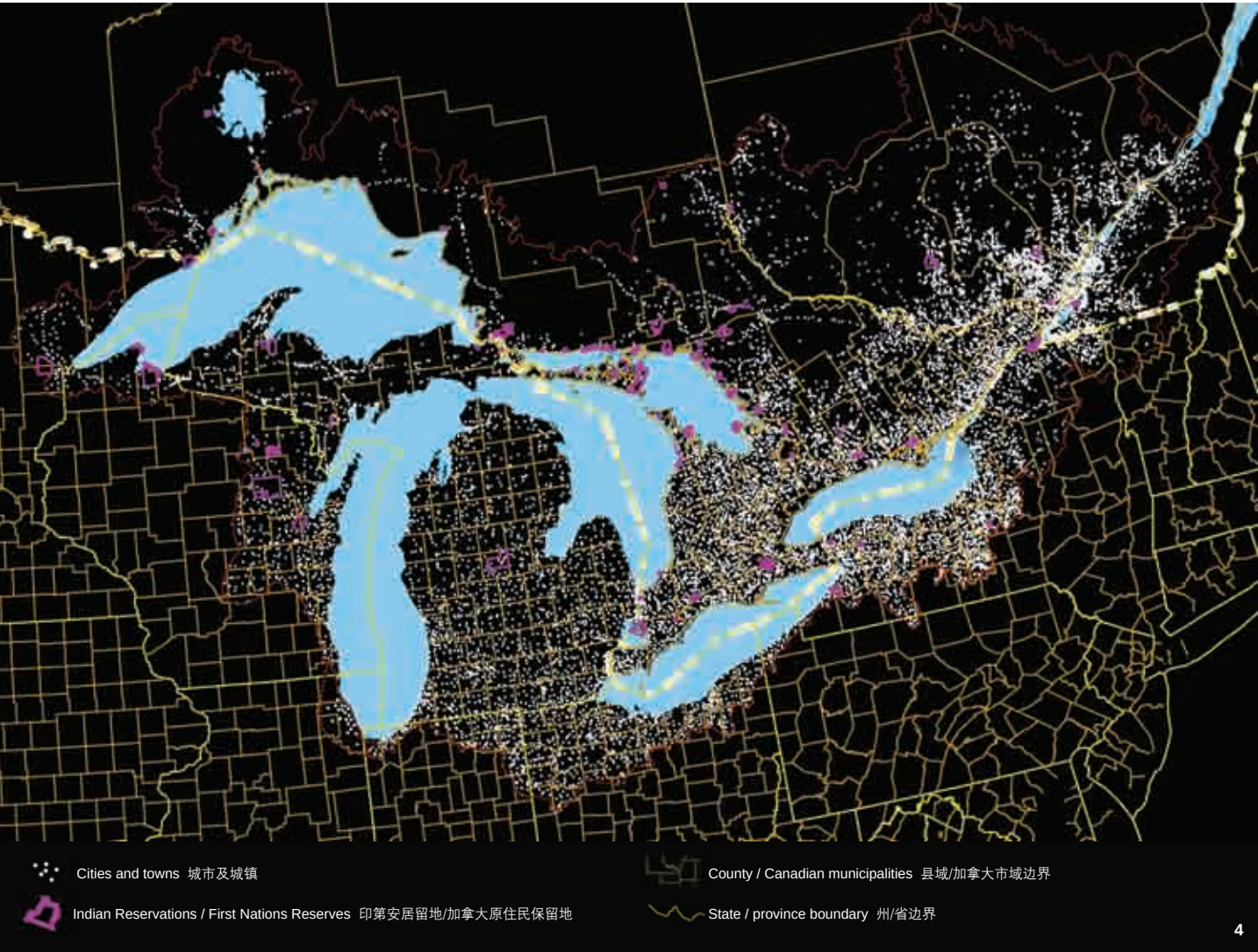
在发出倡议当年及随后的3年中，恩



奎斯特常常作为美国、加拿大（还包括中国、墨西哥和澳大利亚）国际会议的主旨发言嘉宾，运用城市设计的工具——动人心魄的图片和清晰的战略性原则——与不同背景的观众进行互动。除一两次特例外，SOM一直是参与这些会议的唯一一家设计公司；而实际上，“百年愿景”倡议所力图传达的重要信息之一是设计专业人士的重要作用——他们通过与自然和谐共存的城市设计，来确保这个遍布城市的星

球的环境宜居和经济繁荣。在演讲中，恩奎斯特首先会向观众展示一系列令人不安的事实：燃煤发电厂如

1. 芝加哥1909年规划图。由丹尼尔·伯纳姆与爱德华·H·贝纳特绘制。
2. 尺度对比：五大湖-圣劳伦斯河流域非常广阔，通过与欧洲地图的加对比，可以使读者更清晰地理解这一尺度。
1. The 1909 Plan of Chicago, co-authored by Daniel Burnham and Edward H. Bennett.
2. Scale Comparison: The Great Lakes and St. Lawrence River Region is vast; superimposing the region on a map of Europe helps our audience to understand its scale.



何造成城市供水系统的汞污染；过时的都市及农业手段如何对世界最大的（且无价的）地表淡水资源产生危害。随后，他会展示该倡议的愿景：在一个各方相互联系的、负责的且健康发展的流域环境中，人们生活的各个层面将得到怎样的改善。恩奎斯特常常引用提出“系统整体论”的20世纪远见者R·巴克敏斯特·富勒的话：“我们的想法怎会有尽头呢？”

历史上，这一地区曾是最兴盛的工业城市群之一，彼此之间存在着激烈竞争。在20世纪最后的25年间，全球化浪潮侵蚀了支持其财富和权力的制造业基础：五大—圣劳伦斯河沿岸城市共同被不太光彩地称为“铁锈地带”，即以底特律为中心、以至今仍为经济强都的多伦多与芝加哥为两端的这一区域。

布鲁金斯学会智库发布的两个数据展现了过去与未来、环境破坏与经济繁荣之

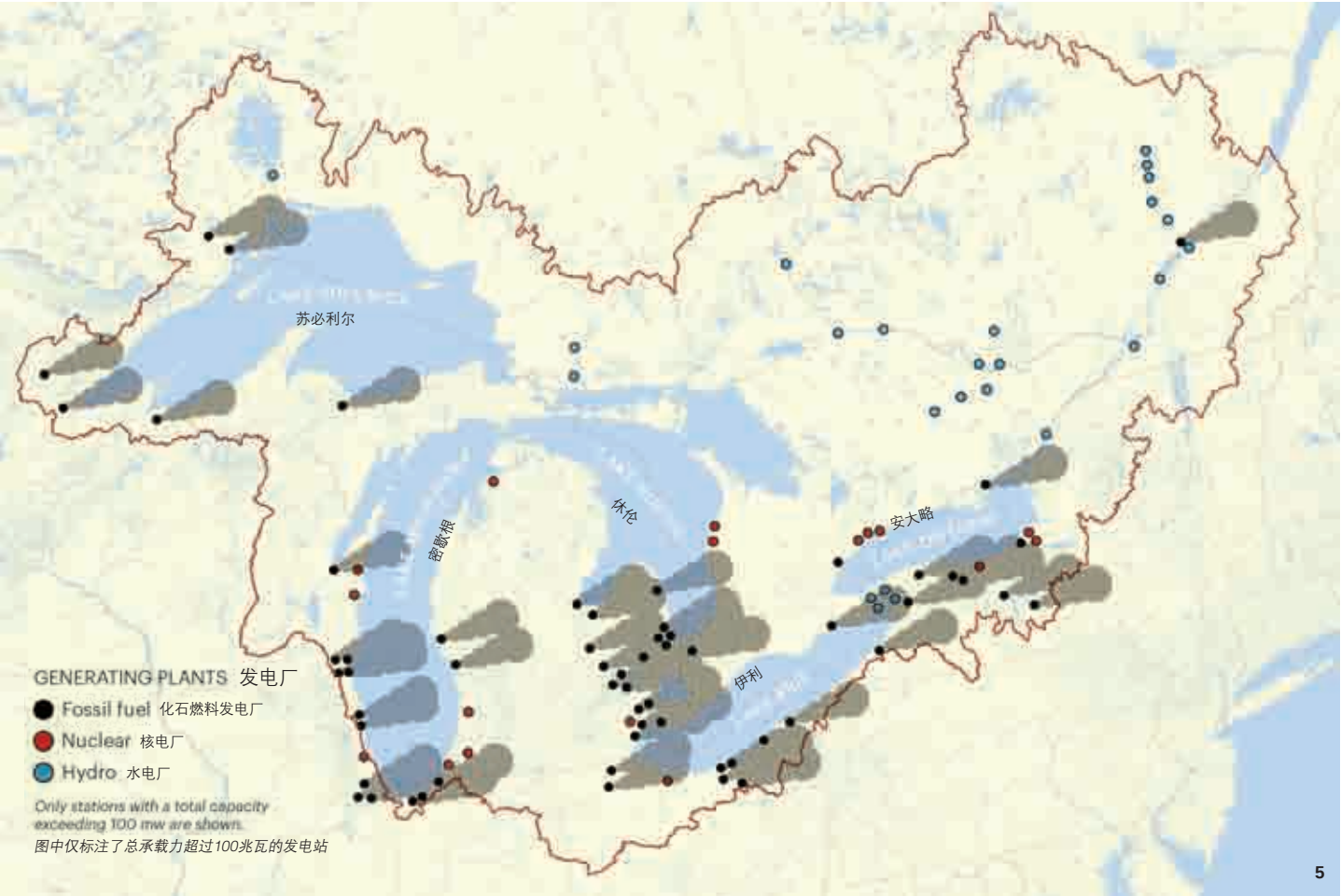
间的联系：该学会的一项深入研究指出，若为清理和恢复五大生态系统投入260亿美元，可带来500亿美元的经济回报。

促进五大—圣劳伦斯河流域城市经济复苏的一项重要战略性原则，源自SOM事务所过去20年间在中国各地进行城市设计的经历：借鉴中国利用高速铁路加强区域联系的成功经验，SOM“百年愿景”中促进经济复苏的一项核心战略即以高速铁路连接起美加两国的主要城市，正如中国将北京和天津连接起来，通过将芝加哥和多伦多相连，形成一条强有力的经济动力廊道——底特律将位于廊道中心，并通过这一国际贸易催生策略带动其经济复苏。

一个富有远见并在情感上被大众广泛接受的概念，是将该流域看作可容纳大都市群5 000万人口的多国共享的超大型公园——该公园是由其自身的生态系统所划

定，而非府和行边界。这一提案并不是要使该地区成为一个独立的区域，而是试图成为一种能够带来大规模行为转变的变革途径：人们不会在这个“公园”中做任何破坏环境的事，那么这个区域的任何

3. 整个流域约17 700km的岸线延展开来的距离约为从芝加哥到珀斯的距离。
4. 15 000个行政单位：未来的规划需要跨越国家、州/省、县、原住民/印第安保留地，以及市域边界。数据来源：《美国印第安地图集：美国的印第安领地》、加拿大自然资源部、Esri。
5. 能源生产：尽管在该流域内已有大规模的可再生能源，但一些古老的发电站仍在污染空气及水源。数据来源：美国环保局《五大地区环境图集》（1995）、安大略电力公司（2009）。
3. The basin's 11,000-mile shoreline would stretch from Chicago to Perth
4. 15,000 Political Jurisdictions: Future planning must span national, state / provincial, county, and First Nation / Indian and municipal boundaries. Data Sources: *US Indian Atlas of the United States: Indian Lands of the United States*, Natural Resources Canada, ESRI.
5. Power Generation: Although large-scale renewable energy is emerging in the basin, many older power plants pollute our air and water. Data Source: *Great Lakes Environmental Atlas* (1995) by US EPA, and Ontario Power Generation (2009).



地方也就不会被破坏。

当城市规划师开始尝试在流域生态系统尺度下考量城市背景，SOM事务所试图用这一全新视角审视其全球范围内的各个项目。例如，SOM现在开始将整个珠江三角洲城市群视为与该三角洲环境紧密相连的系统，并会受到气候变化的影响；而渤海湾城市圈也将迅速发展成为一个必须依靠其自身生态系统维持和供给的城市聚集区。

“五大 百年愿景”不仅提出要改变具有破坏性的大规模农业活动——例如，防止耗氧肥料径流进入水系统——而且提出可持续的本地农业（甚至包括城市内部的农业生产）应当尽可能多地供养城市人口。

SOM“百年愿景”的核心是提倡重塑五大 圣劳伦斯河流域的城市。该愿景试图将人们对于该区域“铁锈地带”的衰退的心理认知转变为谨慎乐观的态度，以应对未来百年预计50%的人口增长（如果考虑该流域占北美不断减少的淡水资源的80%，这一人口增长预测可能被低估了2倍）。SOM的研究人员通过GIS分析预测，

如果不将未来增长引向城市中心区，整个流域将有超过10 360km²已被划为居住用地的土地被城市扩张所吞噬。巧妙限制城市扩张的多伦多绿带被视作规划典范——绿带同时丰富了城市的休闲活动，创造了高品质、小规模农业活动。与之对应，“百年愿景”认为芝加哥的城市闲置土地能够提供225万预计增长人口所需的空

间——这些新增居住空间具有周边社区的平均居住区密度，并拥有舒适环境。“五大 百年愿景”项目完全由SOM自身资金所支持。在这项公共事业倡议进行到第五年的时候，一场由SOM、国际水资源秘书处（蒙特利尔）以及芝加哥建基金会三方合作策划的精彩展览将其推向了高潮。“伟大的城市、伟大的 泊、伟大的流域”展览的目的在于唤醒人们对流域的浩渺和脆弱的认识，使更多大众参与到修复环境、振兴经济的愿景中，并号召人们与 策决定者一道积极承担起改善五大 圣劳伦斯河流域的淡水资源，这一地球最珍贵资源之一的责任。

“不健康的环境中不会有健康的城市”，菲利普·恩奎斯特如是说。LAF



The environment and the economy have always been inter-dependent — for good and for ill. Throughout history, cities were established at environmentally rich locations with abundant water, productive farmland and accessible natural resources. Since the Industrial Revolution, however, the explosive growth of urban populations has thrown increasing and evermore toxic waste streams into the broader environments from which cities were born. This is a story of an international design firm’s vision for restoring the environment and renewing the economy of one of the 20th century’s great industrial ecosystems.

The vast watershed of the U.S.-Canada Great Lakes and St. Lawrence River region

is sometimes referred to as “the cradle of the carbon economy” because of its 150 years of previously unequaled industrial growth and innovation. It is only in recent decades that we have begun to understand the environmental costs for the region’s historical success — costs we still do not factor into the economics of today’s consumer lifestyle. The world can no longer afford to plunder its ecosystems in the name of “progress”, especially in this century of radical global population growth and urbanization.

As a public service now in its fifth year, the City Design Practice of the international design firm Skidmore, Owings & Merrill (SOM) created a strategic 100-year vision for the restoration and renewal of the 50-million

person megalopolis surrounding 20% of earth’s surface fresh water — and more than 80% of North America’s fresh water. Even after much of the consumer-product manufacturing which it dominated for so long has moved elsewhere, including China, the bi-national region remains a USD 4.5 trillion economy. Optimistic at its core, SOM’s Great Lakes Century initiative began with a frank and honest assessment of how the human

6. 五大 地区城市鸟瞰
7. 高速铁路网络构想图：通过连通主要大都市区的现代化铁路网络来增加区域的流动性。
6. Great-Lakes-City aerials
7. Envisioned High Speed Rail Network: Regional mobility can be improved through a modern rail network between our major metropolitan areas.

footprint continues to poison the environment on which its life depends.

Assessing the environmental status quo was an unanticipated creative endeavor for SOM’s volunteer team of urban planners under the visionary direction of its global Design Partner Philip Enquist. One of the most involved planners had some background as a geographer, but even he was challenged reconciling cross-border mapping and statistics that were all recorded somewhat differently in the U.S., Canada and the Province of Quebec.

With satellite images and GIS it was easier to calculate the watershed’s land uses — 42% forests, 33% surface water, 21% agriculture and 4% urban. Counting up the region’s 15,000 units of government was tedious, as was identifying all the region’s hydro, nuclear and coal-fired power plants. Confirming that more than 180 aquatic species had invaded and transformed the basin’s waters took only a short time on the Internet. But it was fun

to illustrate that this Lakes-and-River water system if superimposed on Europe would stretch from London to Marseille and from Normandy to Warsaw; and that the basin’s 11,000-mile shoreline would stretch from Chicago to Perth.

As designers of urban areas worldwide, the runoff of polluted city storm water, sanitary sewer overflows and industrial dumping were well known problems. But evaluating what turned out to be the extraordinarily damaging — lake-killing in fact — impact of agricultural runoff was something new for SOM’s city designers. This statistical mining of silos of expertise brings up an important point about the SOM initiative, which cut across isolated areas of expertise in order to present an overarching vision of the watershed basin as a holistically integrated whole with common problems and a shared future.

The Great Lakes Century Vision was something new — a new way for the region

to see itself. It is also a new ecosystem-scale perspective that SOM believes is the way planners, policy makers and government officials should see their responsibilities in this century of cities and urban mega-regions. America’s leading design organizations — the American Society of Landscape Architects (ASLA) and the American Institute of Architects (AIA) — recognized with their highest national awards the probono initiative’s breakthrough thinking. It also received the unanimous endorsement of more than 100 Canadian and US city mayors, to which Philip Enquist presented the call for a 100-year vision in the initiative’s first year.

Through that year and for the next three years, Enquist was the keynote speaker at international meetings on both sides of the border (as well as in China, Mexico and Australia), engaging diverse audiences using the tools of urban design: compelling images and clear strategic principles. With one or two

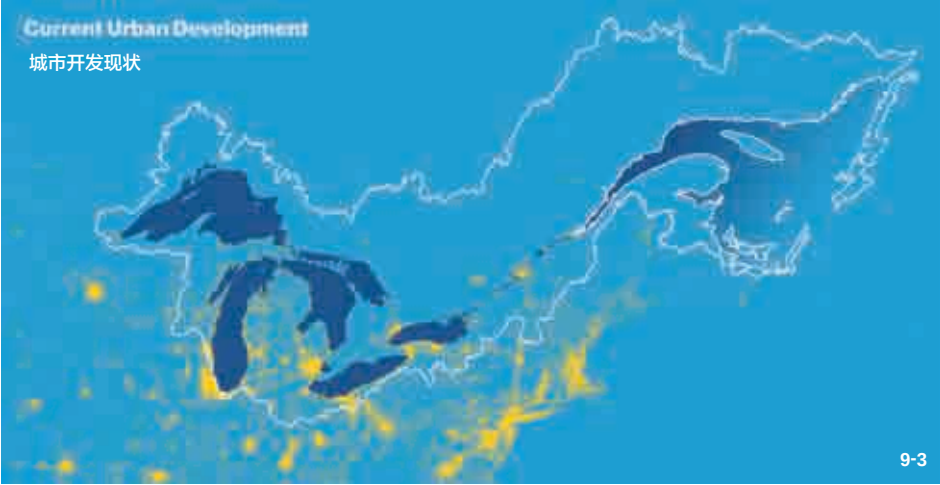
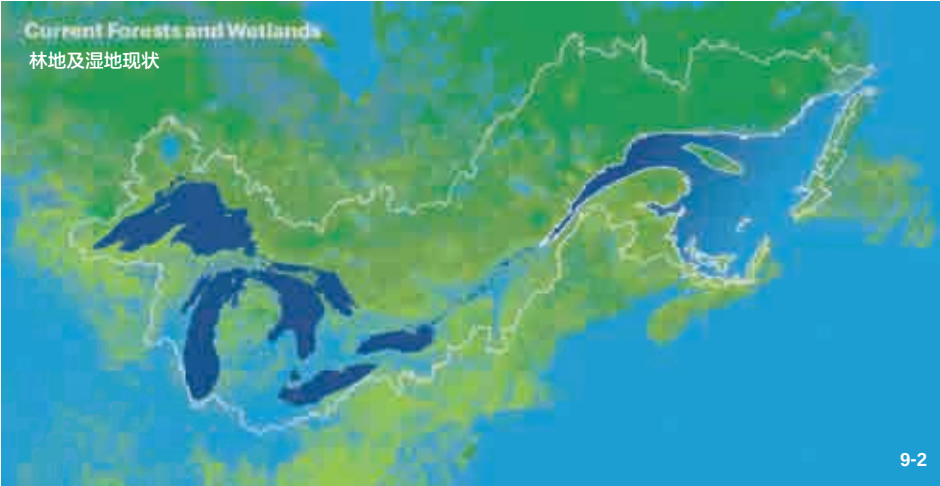
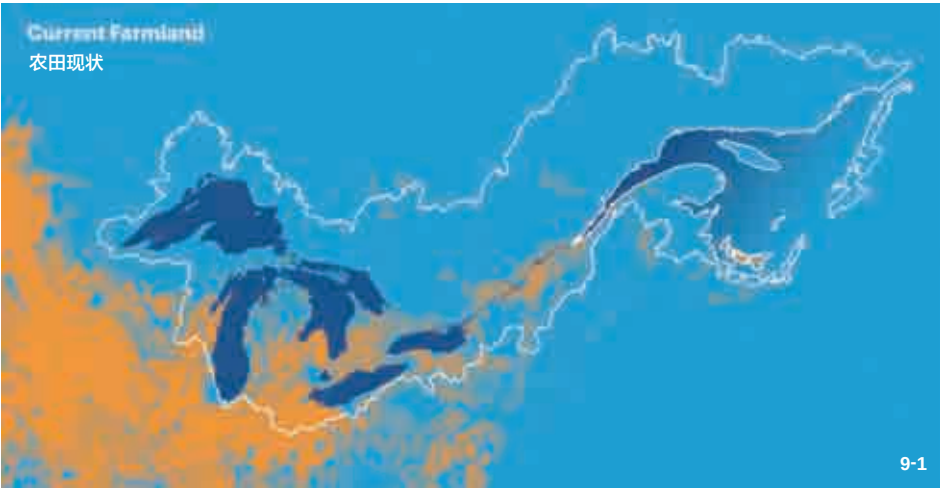
exceptions, SOM was the only design firm in the room, even though a fundamental message of the initiative is that design professionals have an important role to play in ensuring that an urban planet be both environmentally livable and economically viable by designing cities in harmony with nature.

After presenting his audiences with the unsettling facts of how coal-fired power plants were polluting the water supply with mercury and how outmoded urban and agricultural practices were damaging the world’s largest (and priceless) repository of surface fresh water, Enquist would move on to the vision of how much better every aspect of life could be in a connected, responsible and healthy watershed. He often quoted 20th century whole-systems visionary R. Buckminster Fuller: “How big can we think?”

Historically the region was one of prosperous industrial cities in vigorous competition with each other. When globalization eroded the manufacturing bases of their wealth and power in the final quarter of the 20th century, the Great Lakes-St. Lawrence River cities were given a shared, pejorative identity — the “Rust Belt” with Detroit at the center point between the region’s two still-strong business capitals Toronto and Chicago.

Two facts from the Brookings Institution think tank provided a link between the past and the future, between environmental damage and economic prosperity. An in-depth study by Brookings reported that a USD 26-billion investment in cleaning up and restoring the Great Lakes ecosystem would produce a USD 50-billion return in economic activity.

One of the strategic principles for robust economic revitalization of the Great Lakes-St. Lawrence watershed cities came out of SOM’s 20 years of urban design work throughout China. A core strategy for

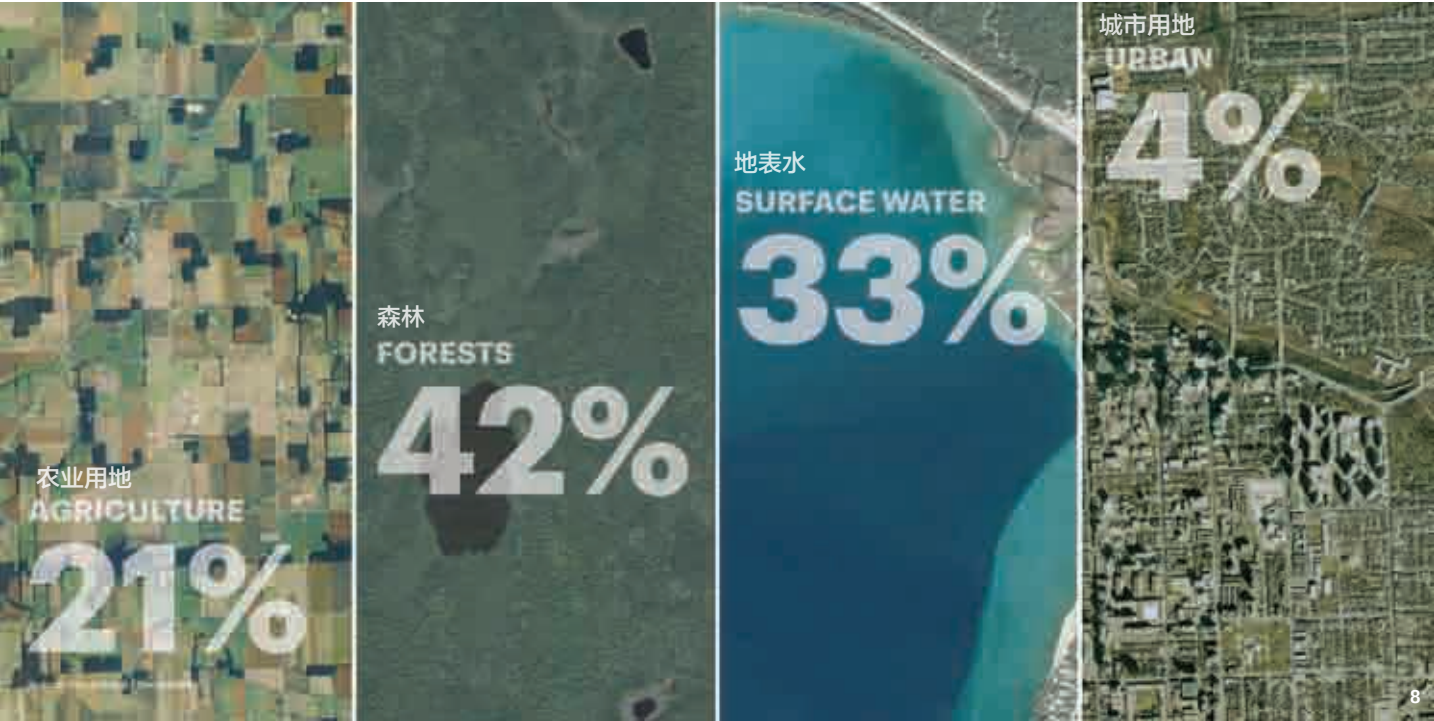


8, 9. 五大 -圣劳伦斯河流域的土地利用现状
8, 9. The current land use in the Great Lakes and St. Lawrence River Basin

economic re-invention is to link the bi-national region’s major cities together with high speed rail, as China has done so successfully. By connecting Chicago and Toronto — as China connected Beijing and

Tianjin — a powerful corridor of economic synergy will be created. At the center would be Detroit, which could be lifted up by this international commerce-generating strategy.

A visionary concept with strong emotional



acceptance by the general public was the idea of seeing the megalopolis of 50 million people as being within a vast park shared by nations — but defined by its single ecosystem and not by government and administrative borders. This was not to advocate that the region become one nation, but as a way to create broad-based behavioral changes. There are environmentally damaging things people would never do in a park, and therefore should not do at all anywhere else.

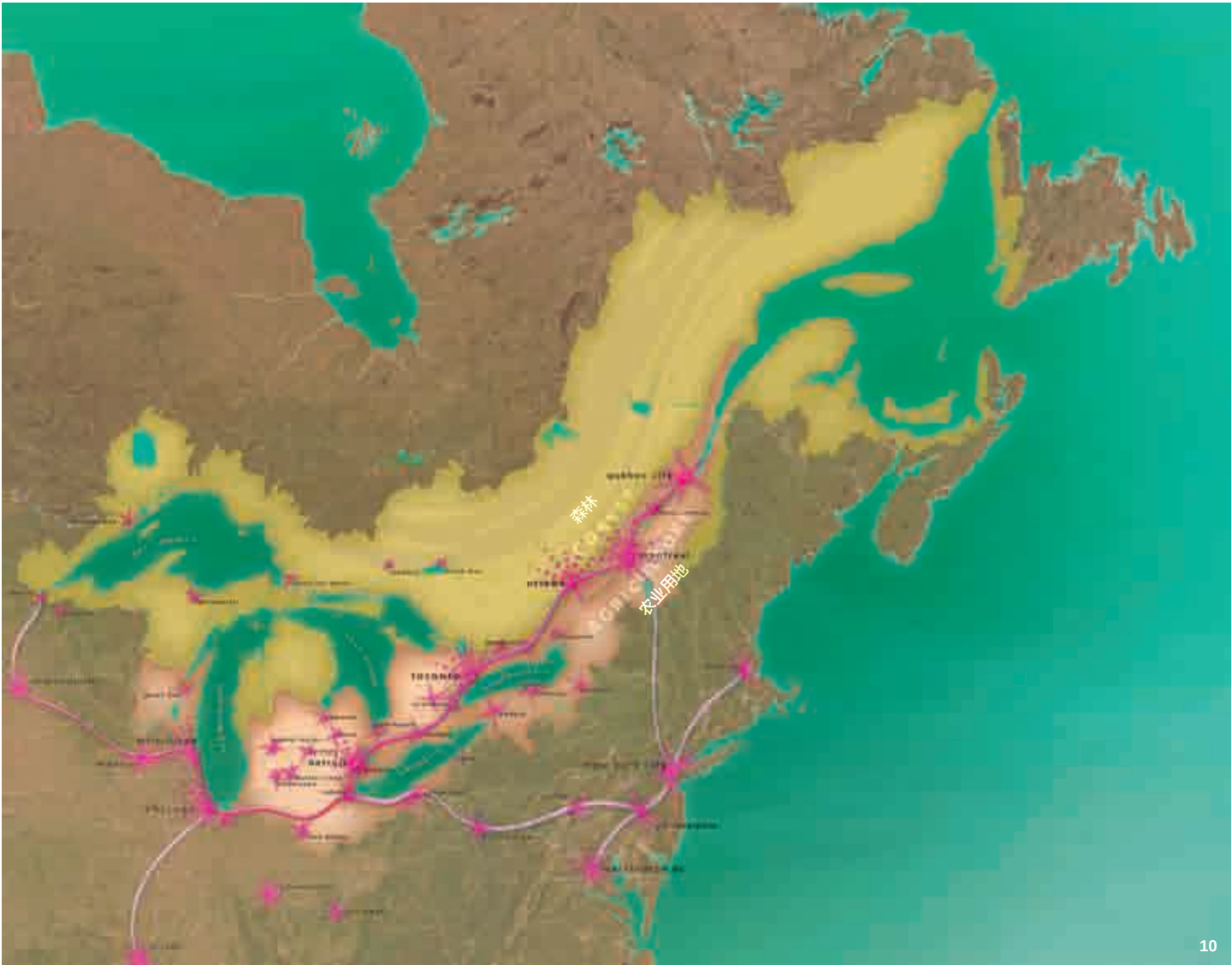
As city planners looking at the urban context within an ecosystem of watershed scale, SOM began to see its projects around

the world with this new perspective. It now sees the entire Pearl River delta as a single urban entity inextricably tied to its environment and how climate change might affect it. Or again, the Bohai Rim will soon be a massive conurbation that must be sustained and fed within its ecosystem.

The Great Lakes vision proposed not only that the damaging practices of large-scale agriculture be changed — for instance, keeping oxygen-depleting nutrient fertilizer runoff out of the water system — but that city populations should be fed by sustainable local agriculture — even within the city — as much

as possible.

At the heart of the SOM vision is a call for the re-invention of the great basin’s cities. The vision attempts to change the regional mindset from a “Rust Belt” mentality of decline into the cautiously optimistic point of view needed to manage projected population growth of 50% (holding 80% of a drying-out North America’s fresh water, that growth projection may be understated by a factor of 2). SOM researchers working with GIS determined that more than 4,000 square miles of open land throughout the region — already zoned residential — could be lost to urban



sprawl, if the growth is not directed into urban centers. Toronto’s wonderful greenbelt limiting sprawl, enriching recreation and renewing high-quality small-scale agriculture was presented as the ideal. Absorbing the total 2.25-million population growth projected for Chicago could be comfortably accommodated within the city’s vacant land and at the density of its average neighborhoods.

The five years of SOM’s public service initiative — funded only by the firm’s partnership — culminated in a dramatic exhibition presented in collaboration with the Montreal-based International Secretariat

for Water and the Chicago Architecture Foundation. The “Great Cities, Great Lakes, Great Basin” exhibition was designed to create awareness of the vastness and vulnerability of the basin, to engage a broad public in its vision of a restored environment and a renewed economy, and to call upon the people and their leaders to take an active responsibility of transforming for the better one of earth’s most valuable assets — the fresh waters of the Great Lakes and St. Lawrence River basin.

“There can be no healthy cities in unhealthy environments.” Philip Enquist says. **LAF**

- 10. 五大 百年愿景：将可持续的土地利用、充满活力的都市中心、城际的连接进行可视化表达是开启长期愿景的关键点。
- 11. SOM与国际水资源秘书处（ISW）、芝加哥建筑基金会（CAF）在CAF的中庭画廊共同举办了“伟大的城市、伟大的湖泊、伟大的流域”展览。
- 10. The Great Lakes Century: Visualizing sustainable land use, vibrant urban centers and intercity connections is the key to inspiring a long-term vision.
- 11. SOM in partnership with the International Secretariat for Water (ISW) and the Chicago Architecture Foundation (CAF), presents an exhibition on “Great Cities, Great Lakes, Great Basin” in CAF’s Atrium Gallery.