

Projects: Five Themes

The projects featured in these pages were selected for *Design with Nature Now* because each in some way narrows the gap between theory and practice and opens up a wider horizon for the future of landscape architecture.

Arriving at the full set of 25 projects for the book involved a long, collaborative process. We began by asking colleagues from around the world to nominate projects that they thought best exemplified and extended McHarg's design philosophy and method. The nomination process resulted in a list of over 80 projects, and after much discussion, we agreed on the final 25.

The projects are organized into five themes: Big Wilds, Rising Tides, Fresh Waters, Toxic Lands, and Urban Futures [each of which is represented in this special issue of *Land Lines*]. Although these themes cover a lot of territory, it will be obvious to readers that the collection does not represent all the types of work the professions of planning and landscape architecture do. We have included projects that engage large complex sites and pressing socioecological issues, and that variously translate into reality what could be referred to as a McHargian ethos of stewardship.

It must be said, however, that some projects show the limitations of the discipline's ability to effect change at the scale that is needed; the projects improve the social and ecological function locally, but may also be part and parcel of development patterns and infrastructural projects that are environmentally degrading at other scales. We wish the full collection comprised a greater diversity of projects from a greater diversity of places. Much as the collection identifies gaps in the thematic areas engaged by contemporary practice, so too there are glaring gaps in the geography of contemporary practice. In short, the project selection is imperfect, but we have found, and hope the reader will also find, that the collection is a good place to begin.

— R. Weller, K. M'Closkey, B. Fleming, F. Steiner

Big Wilds

MALPAI BORDERLANDS | ARIZONA AND NEW MEXICO, USA

IN THE BOOT of New Mexico and the southeastern tip of Arizona along the U.S.–Mexico border, there is a 3,238-square-kilometer (1,250-square-mile) plot of land, almost entirely unbroken by highways or subdivisions. The Malpai Borderlands harbors an estimated 4,000 species of plants, 104 species of mammals, 327 species of birds, 136 species of reptiles and amphibians, and the greatest diversity of bee species in the world. In this biodiverse landscape, 53 percent of the area is privately owned and 47 percent is public—a split that has led to tensions among government agencies, cattle ranchers, and environmentalists.

What sets the Malpai Borderlands apart from other stories of conflict in conservation is how these tensions have largely been overcome in order to conserve the landscape's biological and cultural identity. Fewer than one hundred families use this expansive land to graze their livestock. Despite being long loathed by environmentalists, these cattle ranching families have led the charge to keep the land from subdivision and development.

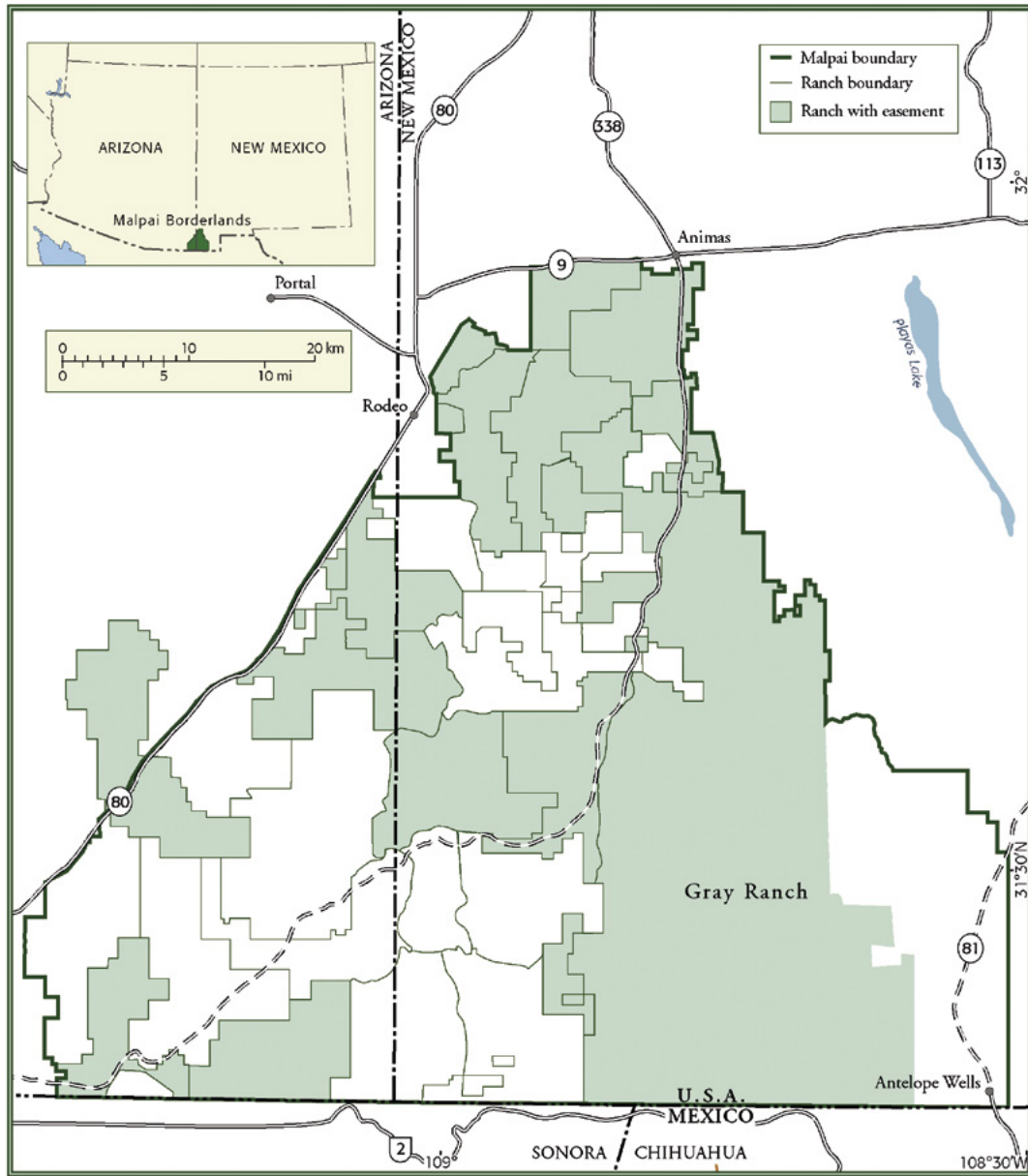
In the early 1990s, the suppression of wildfire caused the land to revert to shrubland dominated by the invasive mesquite tree. This

brushlike tree is bad for grazing and highly flammable, serving as added fuel for forest fires, which can further denude the land. Fire has historically kept the brush at bay, and when a fire broke out on July 2, 1991, ranchers pleaded with the local authorities to let it burn. They did not listen. In response, ranchers committed to stewardship of the landscape formed the Malpai Borderlands Group, which has succeeded in protecting almost 80,000 acres from development.

The success of the Malpai Borderlands Group can be credited both to their reliance on science to help manage the Malpai and to their commitment to educating others about how grazing and conservation can coexist. The first scientist on the board, Ray Turner, specialized in comparative photography, a type of ecological study that traces old photographs to their origin and takes a new picture in the same location. The floral species in the photographs are then compared in order to paint a picture of the area's ecological change. Turner and subsequent scientists have concluded, controversially, that a certain level of ranching can contribute to preserving the land's biodiversity.

Bill McDonald drives in cattle to a corral for branding on the Sycamore Ranch. Credit: Blake Gordon.





Ranches with conservation easements (shown in green). Credit: Darin Jensen.

Project credits: The Malpai Borderlands Group is a nonprofit organization comprising land owners whose mission is to manage the ecosystem of nearly 404,685 hectares (1 million acres) of relatively unfragmented landscape. See www.malpaiborderlandsgroup.org/.

Rising Tides

2050—AN ENERGETIC ODYSSEY | NORTH SEA, THE NETHERLANDS

2050—AN ENERGETIC ODYSSEY, an immersive installation consisting primarily of a thirteen-minute video with maps, diagrams, and drawing, asks the question: What would it look like if the Netherlands and its neighbors were to switch to renewable energy production at a large enough scale to meet the Paris 2015 carbon emissions goals? *2050—An Energetic Odyssey* (the Odyssey) is not a plan; it is a narrative that recasts the landscape architect as provocateur. It uses techniques of data visualization to make complicated issues understandable to a broad, policy-oriented constituency.

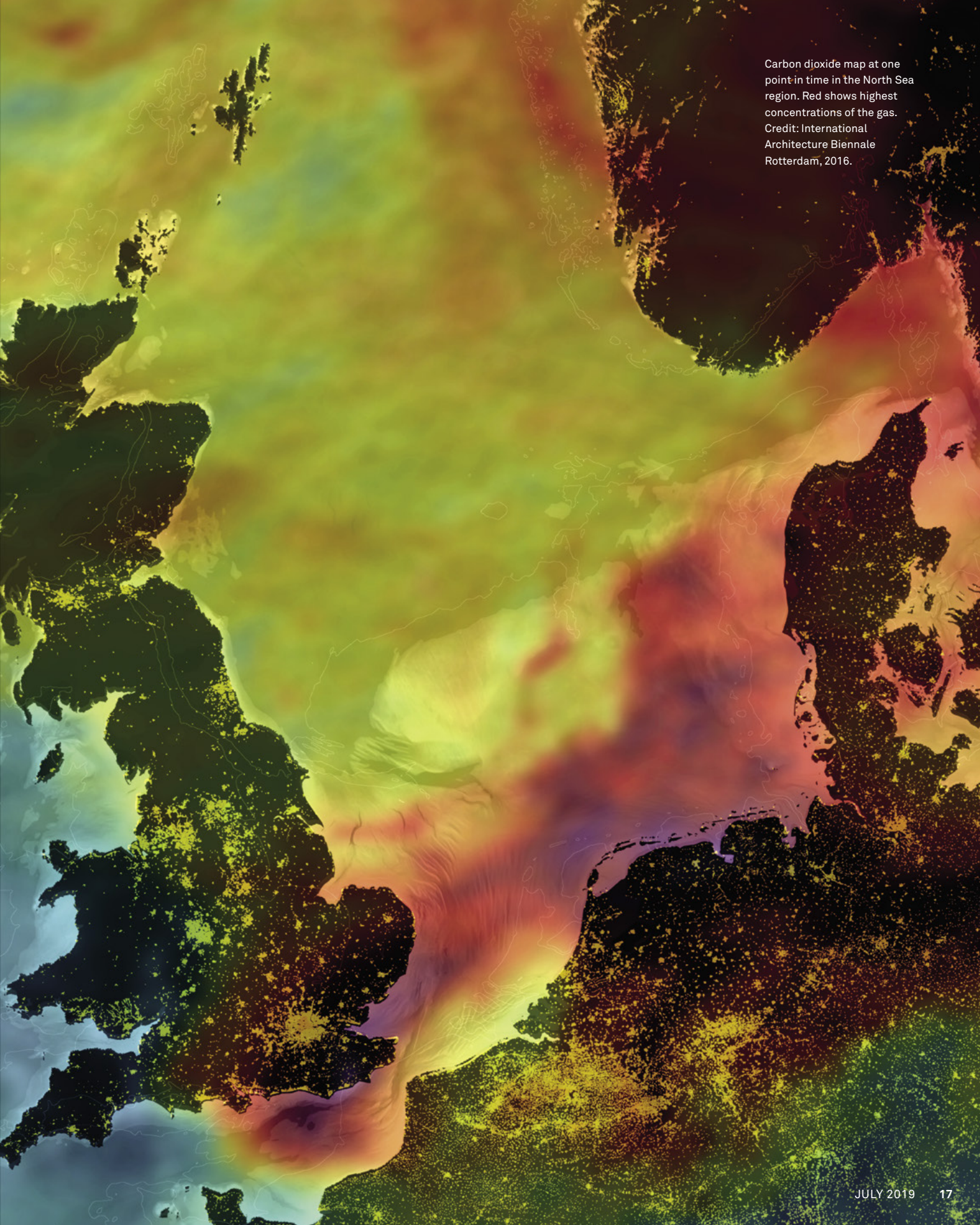
The Odyssey envisions 25,000 wind turbines with a net coverage of 57,000 square kilometers (22,000 square miles) that would enable 75 percent of the North Sea countries' current energy to be converted to renewable energy by 2050. Most of these turbines would be clustered on wind farms off the coastline of the North Sea countries. There is, however, one

notable exception: a proposed cluster of wind farms on Dogger Bank, an ecologically vital sandbank submerged more than 50 meters (approximately 55 yards) below the water's surface in the middle of the North Sea. To produce the necessary energy, a construction island and massive cluster of wind farms would need to be placed on Dogger Bank.

Therefore, the proposed construction method would minimize impacts on sea mammal navigation and avoid conflict with the migratory pathways of birds. The zone closest to the coast, which birds use for orientation, would be left untouched wherever possible, and wind turbines could be temporarily taken out of operation if sensors detected birds approaching. In addition, the wind farm locations could be combined with new marine reserves. Finally, the visual impact of the windfarms would be mitigated by siting the farms more than 19 kilometers (12 miles) out from the coast so that the Earth's curvature would reduce visibility.

The Princess Amalia offshore wind farm. The wind farm consists of sixty wind turbines and is located in block Q7 of the Dutch continental shelf, 23 kilometers (14 miles) from shore. Credit: Siebe Swart, 2013.





Carbon dioxide map at one point in time in the North Sea region. Red shows highest concentrations of the gas. Credit: International Architecture Biennale Rotterdam, 2016.



Spatial occupation of the North Sea, including shipping routes (blue lines), oil and gas rigs (red lines and dots), fishing areas, and international crossings (yellow lines). Credit: International Architecture Biennale Rotterdam, 2016.

Project credits: Commissioned by the International Architecture Biennale Rotterdam (IABR) in the context of IABR—2016—THE NEXT ECONOMY. Concept: Maarten Hajer and Dirk Sijmons. Realized by: Tungstenpro, H+N+S Landscape Architects, and Ecofys in partnership with the Ministry of Economic Affairs of the Kingdom of The Netherlands, Shell, Port of Rotterdam, and Van Oord.

Fresh Waters

WEISHAN WETLAND PARK | JINING, CHINA

The first phase of the Weishan Wetland Park in the town of Jining in China's Shandong Province was completed in 2013. The impetus for this 39-square-kilometer (15-square-mile) park was the adjacent development of a new urban center just south of the existing city of Weishan, near the southeastern edge of the expansive Nansi Lake (also called Weishan Lake). This new southern town will eventually have 50,000 residents in an area that was previously agricultural. The Weishan Wetland Park will filter polluted water from the future development, and it is hoped that it will be the centerpiece of a larger program of nature-based tourism in the region. The proximity to Nansi Lake, one of the country's largest and most polluted lakes, makes the park's purification function especially important, as the lake is a part of China's ambitious, though ecologically and socially disruptive, South-North Water Diversion Project, which redirects fresh water from the Yangtze River in the south to the more arid Yellow River basin in the north.

The master plan is structured around the creation of five zones: core protection, natural restoration, limited human activity, develop-

ment, and a village community. Various types of wetland were restored or created from scratch, with the intention of attracting diverse species of waterfowl and enticing tourists to the park. There is some access to the park by vehicle, but much of the sightseeing can be done only on elevated pedestrian walkways built with local recycled wood and steel.

Although the water filtration and purification techniques used are not novel in the field of landscape architecture, their scale and integration into the new town mark a significant shift in thinking about water, both within the Shandong Province and in China as a whole. As of 2015, 1.3 million hectares (3.2 million acres) of new wetland park had been created and 130,000 hectares (321,000 acres) of wetland had been restored throughout the province.

China is in the process of rethinking its water infrastructure in the face of rapid urbanization and climate change. The national government's renowned "sponge cities" initiative in 2015 funded the development of ponds, filtration pools, and permeable roads and public spaces in sixteen cities to improve flood and drought resilience.



View of the boardwalk through the Weishan Wetland Park. Credit: AECOM.

Tiering and diverse plantings create seasonal interest and opportunities for outdoor science education. Credit: AECOM.



South-North Water Diversion Project (bottom); Eastern Route Project (inset). Credit: AECOM.



Project credits: Client/Owner: Wei Shan Wetland Investment Co. Ltd. Photography: AECOM. AECOM team: Qindong Liang, Lian Tao, Yan Hu, Heng Ju, Yi Lee, Jin Zhou, Enrique Mateo, Xiaodan Daisy Liu, JiRong Gu, Li Zoe Zhang, YinYan Wang, Yan Lucy Jin, Kun Wu, Qijie Huang, Jing Wang, Ming Jiang, Danhua Zhang, Junjun Xu, Shouling Chen, Gufeng Zhao, Benjamin Fisher, FanYe Wang, Shuiming Rao, Changxia Li, Donald Johnson, Agnes Soh. Contractor: Shanghai Machinery Complete Equipment (Group) Co., Ltd. Wetland consultant: Shandong Environmental Protection Science Design and Research Institute. Sculpture consultant: UAP.

Toxic Lands

FRESHKILLS PARK | NEW YORK, USA

THE GENERAL PUBLIC'S negative view of marshland as wasteland in the 1940s helped determine the location of landfills throughout New York City. Fresh Kills landfill is one example. It was opened in 1948 as a temporary landfill on Staten Island on the banks of the Fresh Kills estuary. Robert Moses, a key figure in the city's planning, promoted the landfill at Fresh Kills, hoping to later reclaim its marshland for real estate development and to build an expressway connecting Staten Island to New Jersey and Brooklyn.

Despite strong opposition, the Fresh Kills landfill remained, becoming permanent in 1953. At its peak in the 1980s, the landfill received up to 29,000 tons of refuse daily, and averaged 2.8 million tons annually over its lifespan. Over time, its four garbage mounds grew from a few feet above sea level to 69 meters (225 feet) tall. Until its closure in 2001, Fresh Kills reigned as the largest landfill in the world.

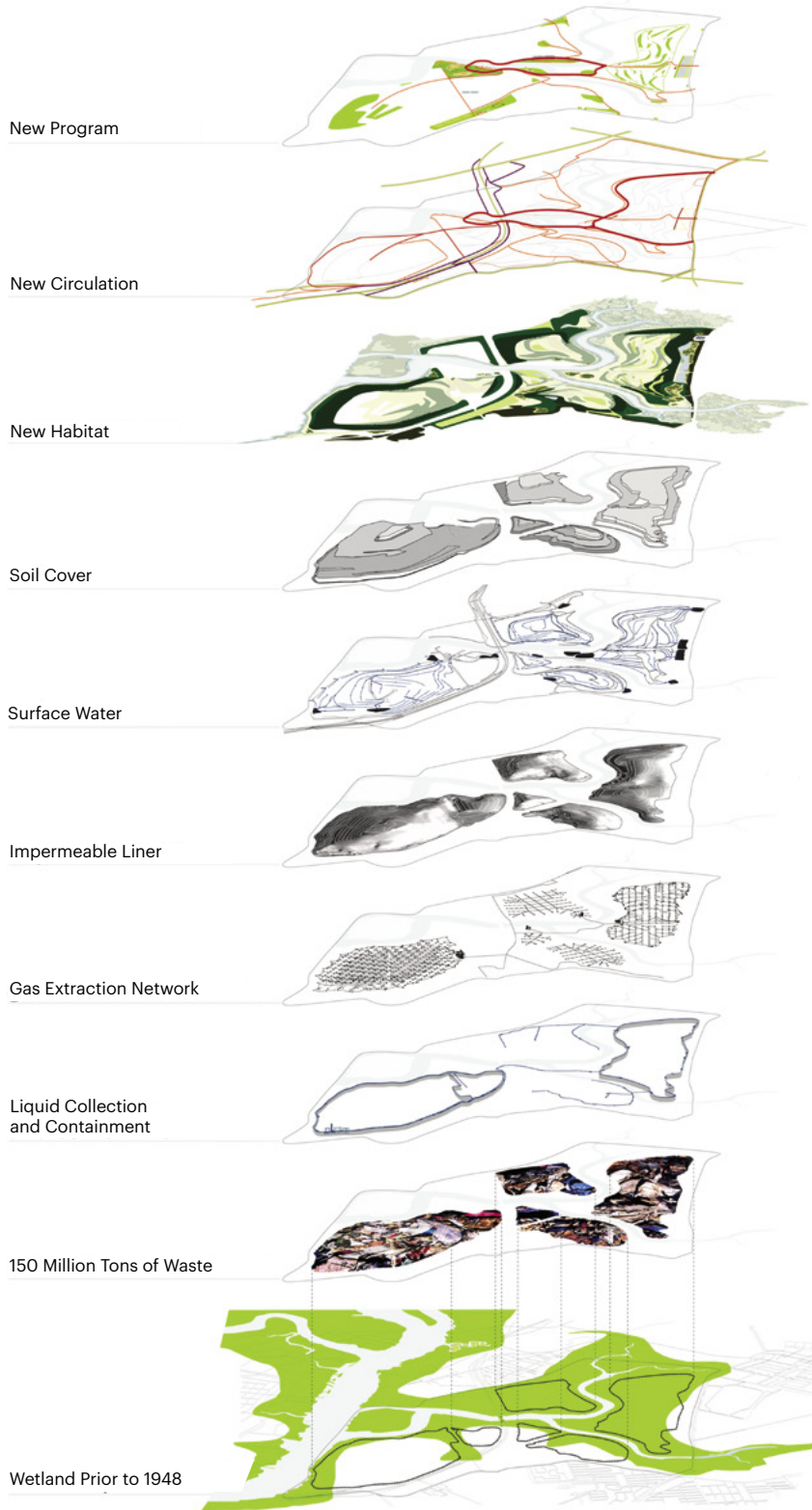
Restored wetlands are visible in the foreground of a capped landfill mound. Credit: Alex S. MacLean/Landslides.

From 2003 to 2006, the design firm James Corner Field Operations and its consultants worked to create a master plan for the site. Capping a landfill and converting it to public open space is hardly a new practice, but creating a viable ecology in such a hostile location requires innovation and experimentation. First the landfill was capped and the infrastructure for methane extraction was set in place. Then, since importing good topsoil to cover the vast landfill (which was nearly three times the size of Central Park) was not feasible, the designers developed methods of in situ soil development through a highly curated process of plant succession. Various planting strategies have been tried, monitored, and adjusted.

The creation of Freshkills Park is a work in progress and is not expected to be completed until 2036. Once built, the new park will enlarge the existing 1,214-hectare (3,000-acre) Staten Island Greenbelt and connect it to the William T. David Wildlife Refuge, offering the community a full range of recreational activities.



Freshkills Park landscape layers. Credit: James Corner Field Operations.





Freshkills Park illustrative plan. Credit: James Corner Field Operations.

Project credits: Project lead, landscape architecture, urban design: James Corner Field Operations. Consultant team: AKRF; Applied Ecological Services; Arup; Biohabitats, Inc.; BSKS Architects; Brandston Partnership Inc.; Jacobs (previously CH2M Hill); Daniel Frankfurt; Faithful + Gould; Geosyntec; HAKS; Hamilton, Rabinovize & Alschuler; Langan; L'Observatoire International; Philip Habit and Associates; Project Projects; Rogers Surveying; Sage & Coombe Architects; Richard Lynch (ecologist); and Sanna & Loccisano Architects (expeditors).

Urban Futures

MEDELLÍN | COLOMBIA

THE CITY OF MEDELLÍN suffers from extreme inequality that is reflected in its housing types and the broader built environment within the city's valley section. The wealthy tend to live in central, well-served enclaves, while the poor live on peripheral steep slopes in self-constructed settlements. Since 2003, the city has undergone an internationally recognized urban transformation, coinciding with a restoration of peace in what was once the most dangerous city in the world.

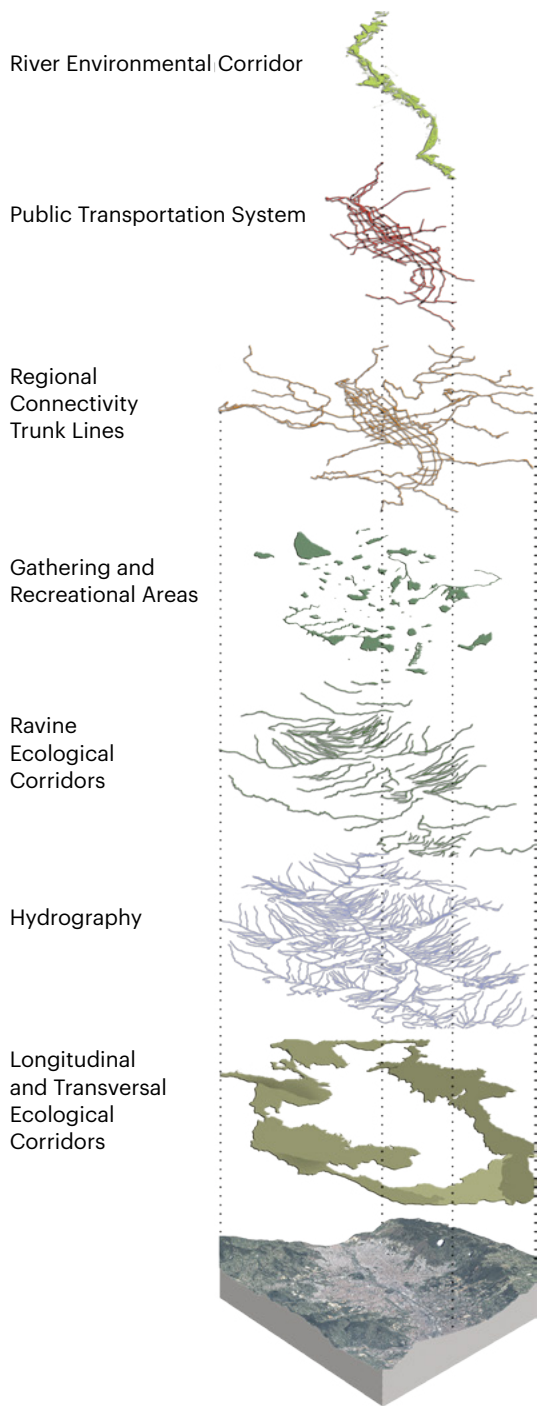
In 2004, Medellín began rapidly linking what it identified as “nodes of development” in some of the city's poorest neighborhoods—libraries, schools, and public spaces—to public transportation. It built gondolas, escalators, and bridges over steep ravines to link those neighborhoods to the city's metropolitan transit system. Public space projects have also been built to bring more life to the channelized river. The Medellín River Parks Master Plan is a linear

sequence of public spaces along the river that bisects the city and is where the oldest formal elements of the city are located. The construction of the first phase of the park required a section of the highway to be buried beneath the new park, and bridges have been built across the river, connecting the two parts of what had been a divided city.

These projects are an outgrowth of a philosophical and practical shift in planning first described in the city's *Plan de Ordenamiento Territorial* of 1998, a document that built on existing United Nations efforts to provide basic services to the informal communities, or *comunas*, on the urban periphery. This document is still used and was updated in 2017, with an added focus on sustainability, walkability, accessibility, and the revitalization of the urban core. Practically and symbolically, the poorest residents were able to connect to the city and to the civility and services it promises its citizens.

Aerial view of the first phase of the Medellín River Parks, constructed in 2016. Credit: Alejandro Arango Escobar.





A section of highway was buried beneath the new park and bridges have been built across the river, connecting the two parts of what had been a divided city.

Though Medellín has successfully provided services to informal settlements on its periphery, the question of how informal settlements arise in the first place and whether their growth can be planned is also relevant to the millions of people expected to migrate to rapidly urbanizing cities in this century. A significant planning document that addresses this larger issue is the recently completed BIO 2030 Plan—a strategic plan to structure future growth through cooperation among the ten municipalities of the Aburrá Valley—produced by governmental bodies in collaboration with Urbam, the Center for Urban and Environmental Studies at EAFIT University in Medellín, an organization led by Alejandro Echeverri. This comprehensive plan documents the geology, hydrology, ecology, and fragmentation of the entire valley and, using these layers as a base, provides detailed designs for different developments. Similarly, professors of landscape architecture and urban design David Gouverneur and Christian Werthmann, among others, are developing projects with students related to the social, ecological, and political challenges of designing informal settlements. Gouverneur’s Informal Armature approach offers a framework for self-constructed neighborhoods, prior to the occupation of the land, and Werthmann’s team, building on the work of Urbam EAFIT, offers detailed construction techniques to minimize risks from earthquakes and landslides and maximize access to basic infrastructure.

The built and natural systems of the Aburrá Valley, including transit, recreation areas, hydrology, and ecological corridors. Alcaldía de Medellín, Área Metropolitana del Valle de Aburrá, Urbam EAFIT, 2011. Credit: Bio 2030. Plan Director Medellín, Valle de Aburrá. Un sueño que juntos podemos alcanzar. Medellín: Urbam EAFIT.



Shifting Ground pilot projects in informal settlements: cooperative micro-farming, slope stabilization, reforestation, and warning system. Credit: Institute of Landscape Architecture, Leibniz Universität Hannover (ILA, LUH) / Centro de Estudios Urbanos y Ambientales (Urbam) / Escuela de Administración, Finanzas e Instituto Tecnológico, Universidad Medellín (EAFIT).

Project credits: Plan Director Medellín, Valle de Aburrá. Un sueño que juntos podemos alcanzar. Medellín: Alcaldía de Medellín, Área Metropolitana del Valle de Aburrá and Urbam EAFIT, www.eafit.edu.co/centros/urbam/articulos-publicaciones/SiteAssets/Paginas/bio-2030-publicacion/urbameafit2011%20bio2030.pdf. Medellín River Parks: Architectural design: Sebastián Monsalve, Juan David Hoyos. Design team: Osman Marín, Luis Alejandro Jiménez, Andrés Santiago Fajardo, Sebastián González, Juan Diego Martínez, María Clara Trujillo, Alejandro Vargas, Carolina Zuluaga, Daniel Zuluaga, Sara París, Daniel Beltrán, Daniel Felipe Zuluaga, David Castaneda, Alejandro López, David Mesa, Andrés Velásquez, Juan Camilo Solís, Melissa Ortega, D. David Hernández del Valle. Landscape design: Nicolás Hermelín. Photography: Alejandro Arango Escobar, Sebastián González Bolívar. Engineering team: Consorcio EDL. Builder team: Guinovart Obras y Servicios Hispania S.A. Grupo OHL Construcción. Construction supervision team: El Consorcio integral—Interdiseños. Design audit team: Bateman Ingeniería S.A. Medellín's town hall: Anibal Gaviria. Director of Administrative Department of Planeación de Medellín: Jorge Alberto Pérez Jaramillo. Management of Medellín River Parks: Antonio Vargas del Valle.

Shifting Ground / Medellín Project team: Institute of Landscape Architecture, Leibniz Universität; Hannover: Christian Werthmann, Joseph Claghorn, Nicholas Bonard, Florian Depenbrock, Mariam Farhat; Centro de Estudios Urbanos y Ambientales (Urbam) / LA Universidad EAFIT (Escuela de Administración, Finanzas e Instituto Tecnológico): Alejandro Echeverri, Francesco María Orsini, Juan Sebastian Bustamante Fernández, Ana Elvira Vélez Villa, Isabel Basombrío, Diana Marcela Rincón Buitrago, Juan Pablo Ospina, Anna Manea, Daniela Duque, Ángela Duque, Simón Abad, Lina Rojas, Maya Ward-Karet, Santiago Orbea Cevallos; Harvard Graduate School of Design: Aisling O'Carroll, Conor O'Shea. *Contracting authority:* Municipal Planning Authority of the City of Medellín. *Cooperation partners:* Fundación CIPAV, Fundación Sumapaz, Anibal Gaviria Correa, Jorge Pérez Jaramillo, Juan Manuel Patino M., Paola Andrea López P., Sergio Mario Jaramillo V., David Emilio Restrepo C., Mario Flores, John Cuartas, María Alejandra Rodríguez N. *Participating project specialist:* Eva Hacker, soil bioengineering; Marco Gamboa, geology; Michel Hermelín, geology; Iván Rendon, sociology; Tatiana Zuluaga, urban planning. *Duration:* 2011–today.