

CYCLES

LANDSCAPE URBANISM

new kind of project
Urban-surface
Field Ecology (Landscape Ecology) □

CYCLES

Water and nutrient cycles
Urban-water cycle
Water stresses
Creative water solutions
Projects

Water engineering

Inefficiency and false (engineering) decisions about water management and use contribute to water shortages worldwide

Water cycles

Rise in global temperatures due to GHG emissions is fundamentally altering the cycling of water between sea, atmosphere and land.

Watershed

Healthy watersheds, including floodplains and wetlands, provide clean drinking water more cheaply than technology.

DEFINITIONS

Science

The role of modern science is to control the natural world for human purpose. Uncertainty in nature can be controlled by technology.
The role of New Science is to help people adapt to natural variability.
New theory accepts and embraces uncertainty and unpredictability.

Resilience

Resilience is the capacity of a system to withstand disturbance while still retaining its fundamental structure, function and internal feedbacks.

Ecosystems

Ecosystems are self-organizing, self-producing systems in which each major component exists in a vital relationship with other components in space and time.

Biodiversity

Biodiversity is the phenomenal multitude of species on Earth.
Biodiversity begets biodiversity – it is a cumulative process, where the evolution of species has, on average, exceeded extinction rates.

Heinberg, R. + Lerch, D. (Eds.) Post Carbon Reader. Healdsburg: Watershed Media, 2010.

stba

Contemporary City

Landscape Urbanism

Landscape Urbanism

Parc de la Villette

Landscape Urbanism

Landscape of social instruments

Drosscape

Waste Land

Part of the urban growth cycle

Euregio Maas-Rhein

Regional structuring

Space, communication, process

Landscape Urbanism

Landscape Urbanism

- landscape architects absorb urban design
- urban-design adopt landscape, environmental +ecological principles

What is landscape urbanism?

- hybrid design discipline combining:
Landscape- and Urban Planning and Design +
ecology and technology

Why landscape urbanism?

- the contemporary metropolis is out of control -
this is not its weakness but its strength;
traditional disciplines are inadequate (JC)

Why „landscape“

- „landscape by virtue of its programs, textures and flows“
- from planned ecological greenways in Stuttgart to
sprawl mitigation in Las Vegas

Landscape Urbanism

Synthesis

Landscape:

surface modelling, implanting,
cultivating, layering,

Urban Planning:

diagraming, organizing, assembling, zoning,
marketing, process managing

Landscape + Urban:

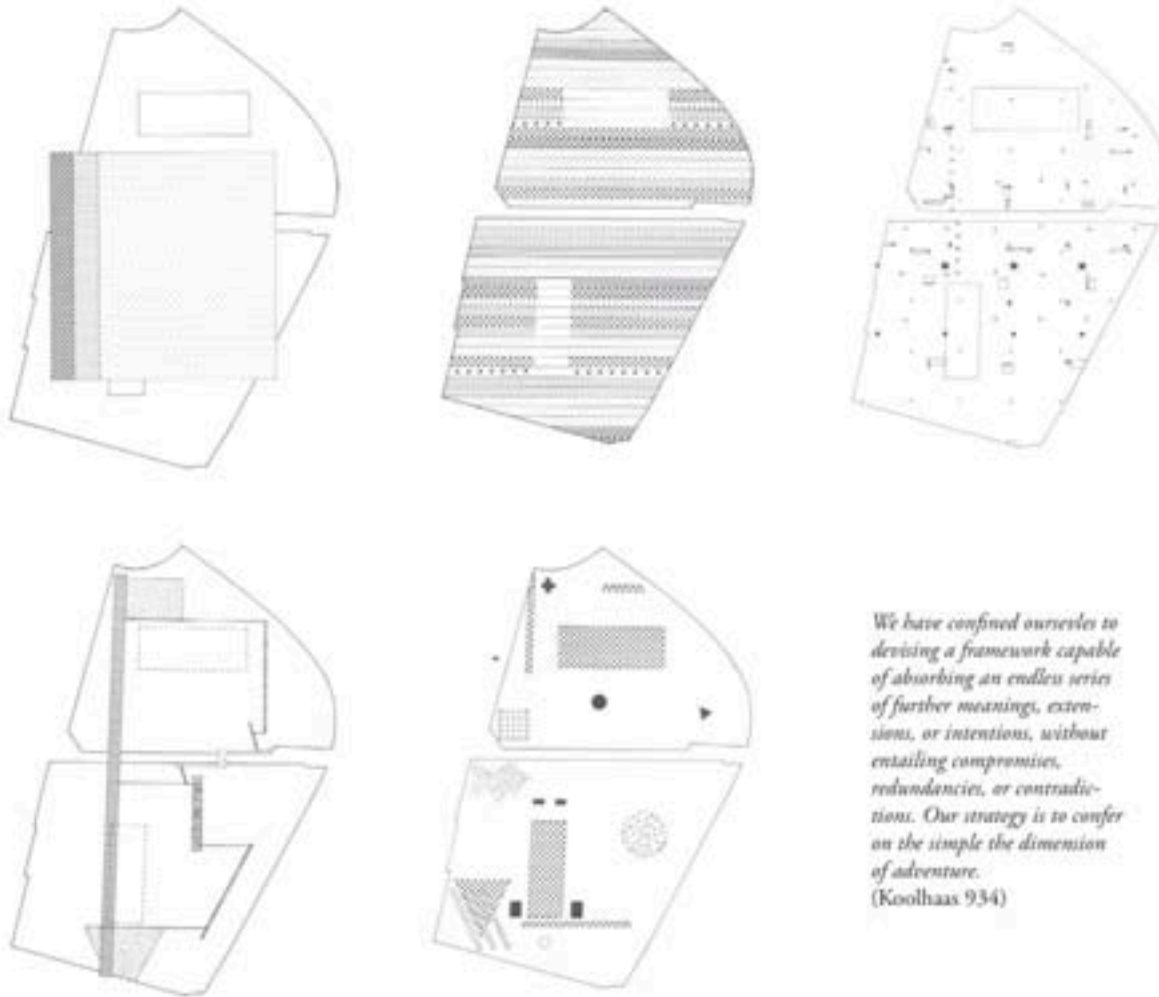
mapping, cataloguing, strategizing, scenarios,
managing, phasing

Parc de la Villette, OMA

Paris. Project. OMA, London-Rotterdam, 1982-4
54 Ha (121 acres): slaughterhouse – remediation;
along the industrial periphery of Paris

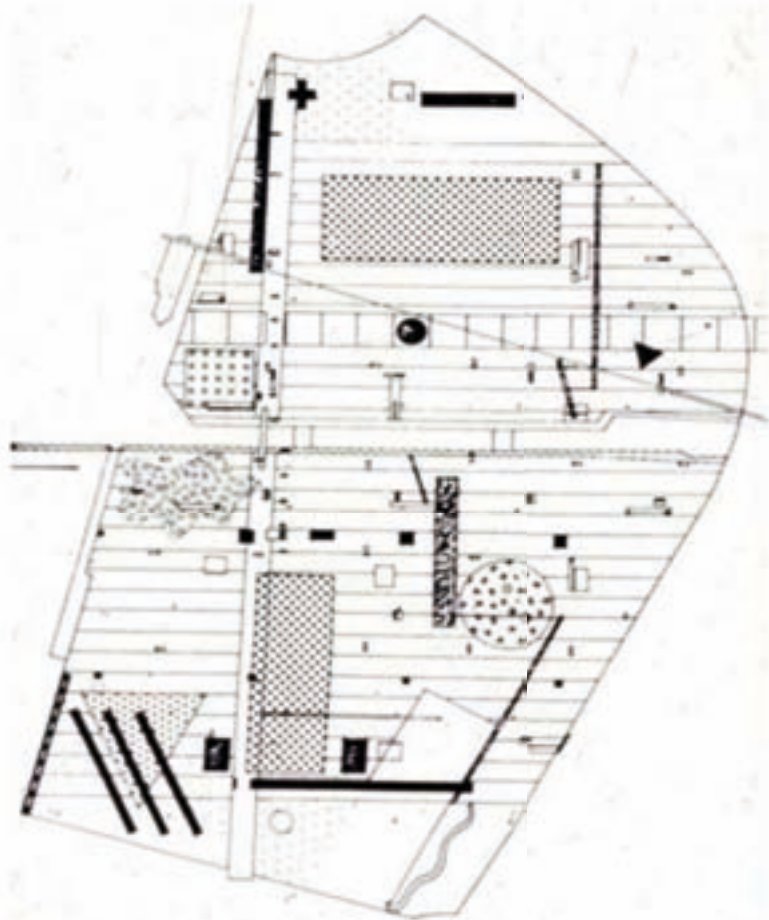
- superposition produce a “a field of social instruments”
- program as dynamic (motor) of a project uncertainty
- not design style and form but strategic organization
- quality derives from juxtapositions and adjacencies

Parc de la Villette, OMA



We have confined ourselves to devising a framework capable of absorbing an endless series of further meanings, extensions, or intentions, without entailing compromises, redundancies, or contradictions. Our strategy is to confer on the simple the dimension of adventure.
(Koolhaas 934)

Parc de la Villette, OMA



Landscape - Parc de la Villette, OMA



Drosscape

Wasting Land in Urban America. Alan Berger. NY: Princeton Arch Press, 2006.

- declining and de-industrializing areas
- decontamination, health, safety

- an indicator of healthy urban growth
- de-industrialization as technical innovative processes

- designer as collaborator, negotiator and conductor
to: speed up or slow down waste processes

Drosscape – Brownfield, LA



Drosscape – Hammon, IN



Drosscape – shopping center site



Drosscape – Industry, Riverside Co.



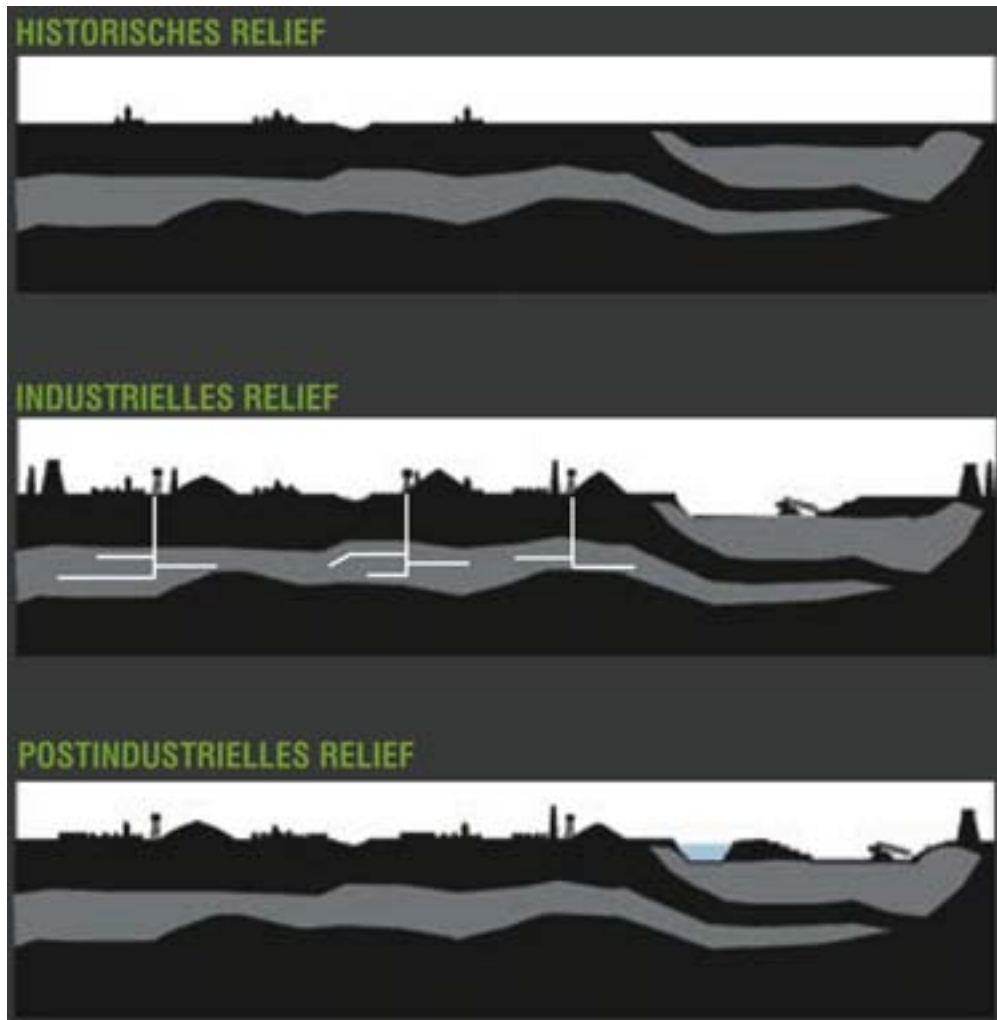
Euregio 2008

- Goals:** vision, structure, communication, management
geologic structure and industrial history
linking industry, nature, technology and culture
movement and communication
- Project:** spatial structure + masterplan
communication system at 3 levels
management structure including participation
regional charta

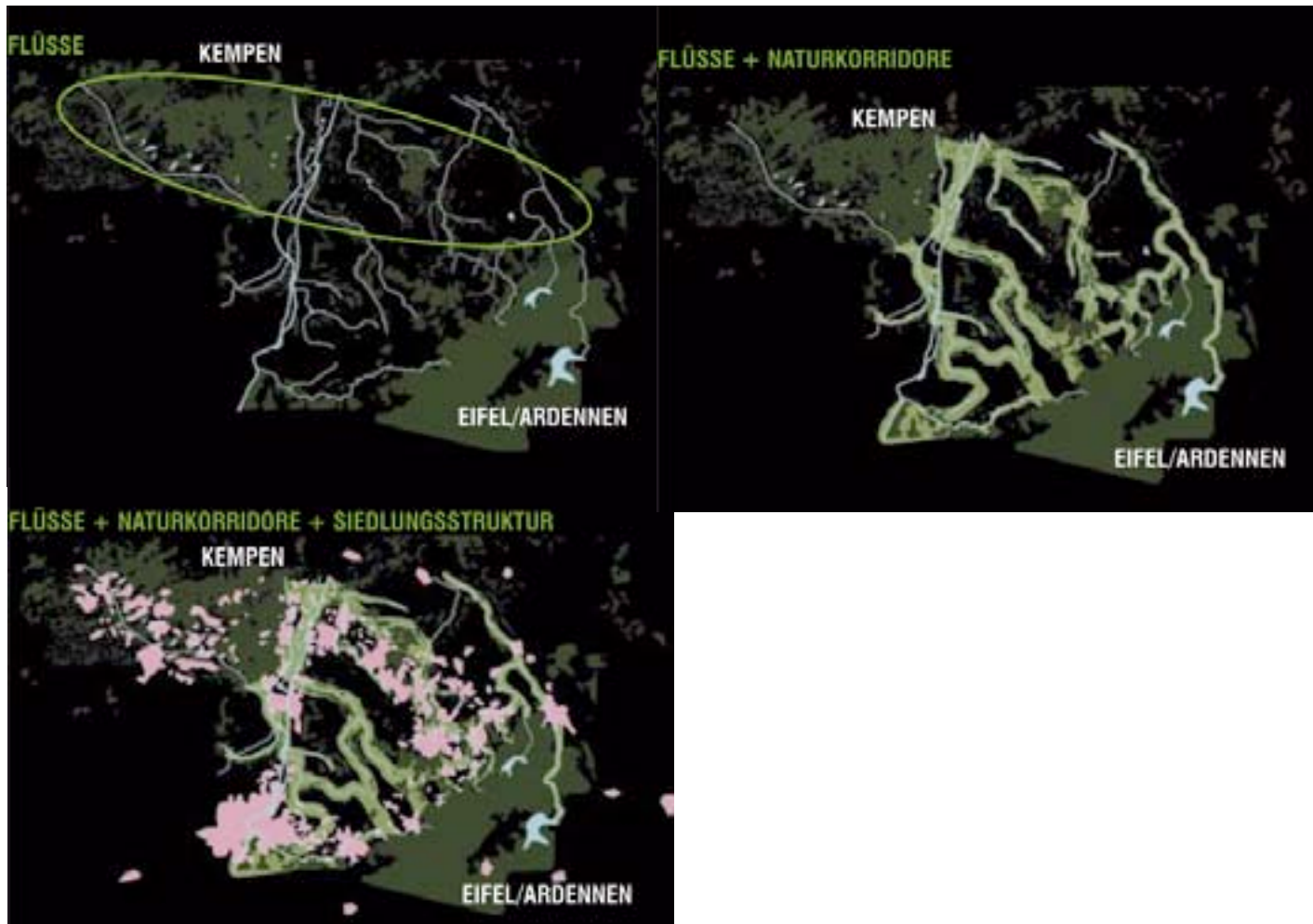
Euregio 2008, Team Bava + Agence Ter, 2005



Euregio 2008, Team Bava + Agence Ter, 2005



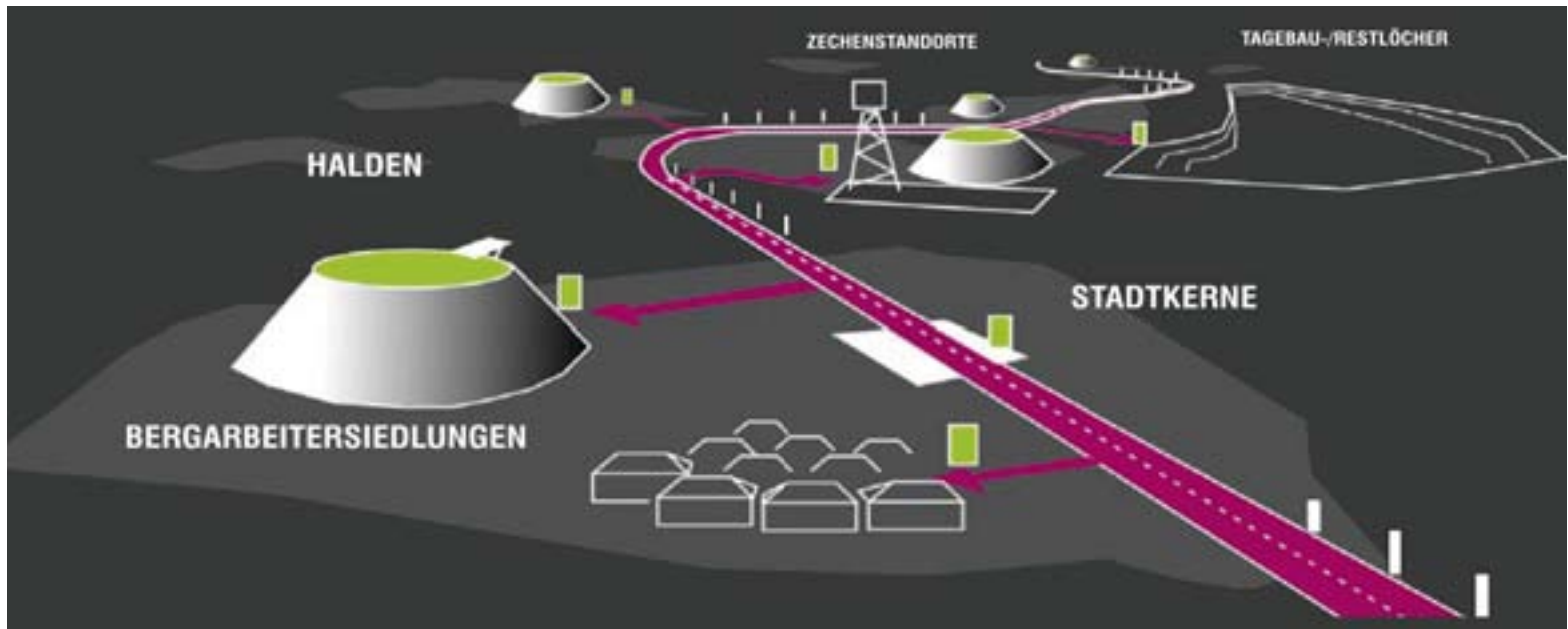
Euregio 2008, Team Bava + Agence Ter, 2005



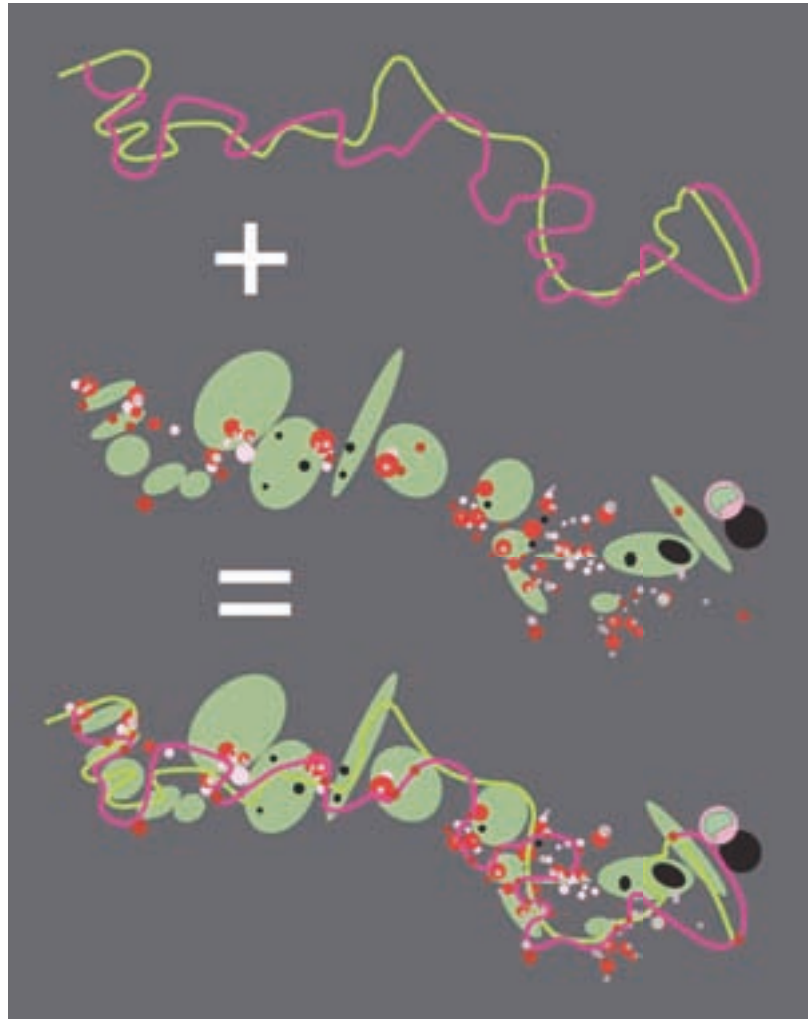
Euregio 2008, Team Bava + Agence Ter, 2005



Euregio 2008, Team Bava + Agence Ter, 2005



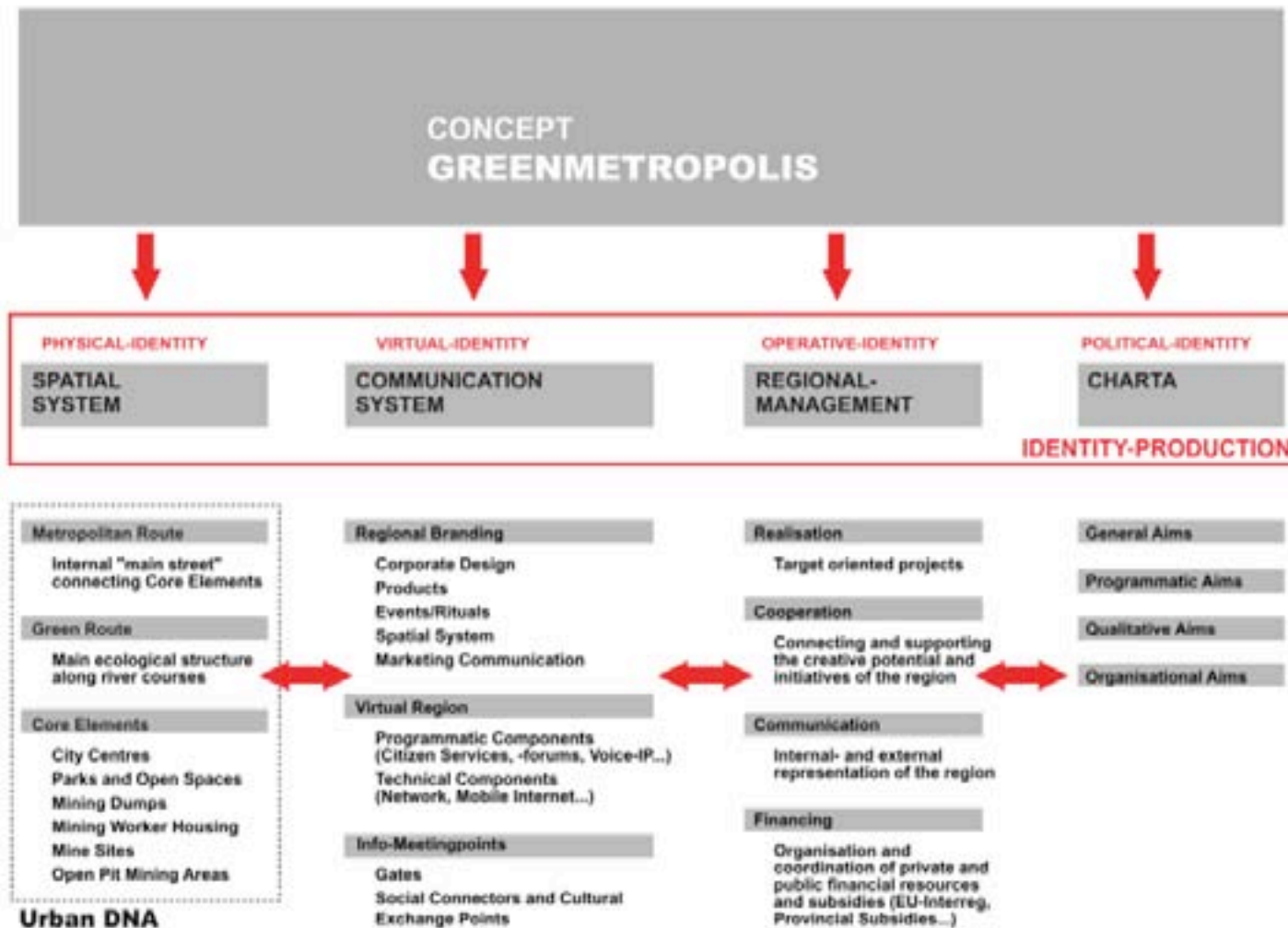
Euregio 2008, Team Bava + Agence Ter, 2005



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Euregio 2008, Team Bava + Agence Ter, 2005

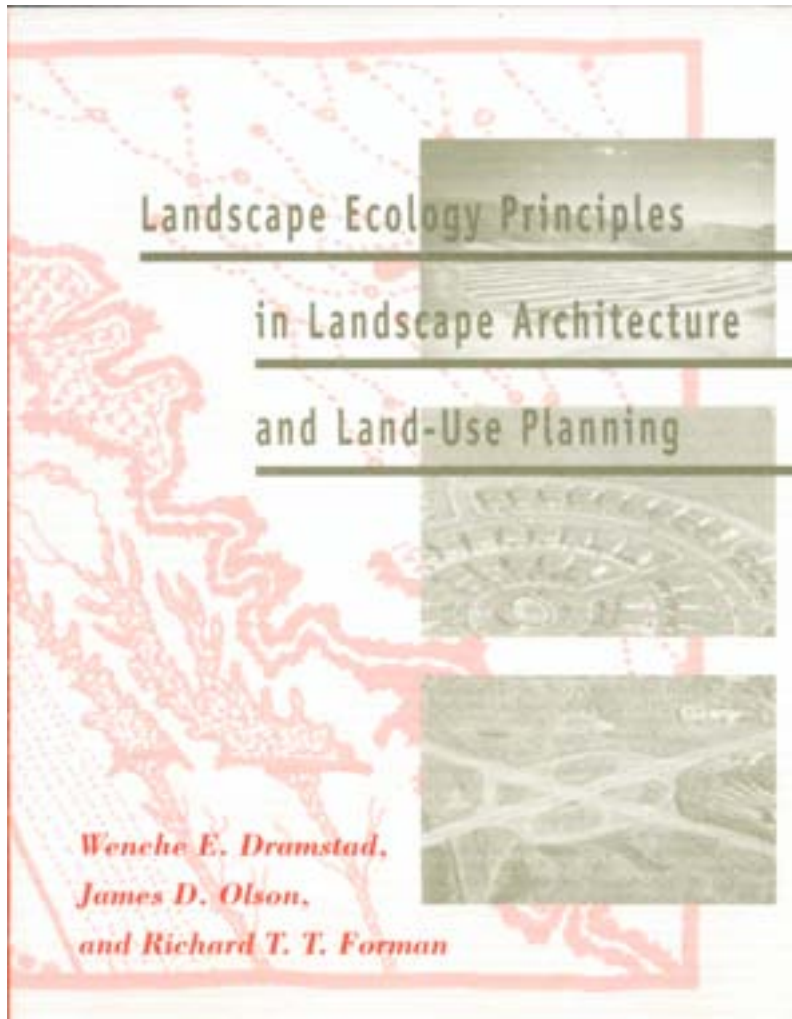


The Urban Surface – die städtische Oberfläche

From urban surface to Landscape Urbanism: Design strategies

1 thickening	(endickend Bindmittel)	Schouwburgplein, West 8
4 folding	(faltend)	Yokohama Port Terminal, FOA
5 new materials	(neue Materielle)	Parc Val d'Hebron, Eduard Bru
4 un-programmed use	(unprogrammatische Nutzung)	Schouwburgplein, West 8
5 impermanence	(unbeständigkeit)	Parc de la Villette, OMA
6 movement	(Bewegung)	Euregio 2008. Team Bava

Field Ecology



Field Ecology

Field Ecology Principles

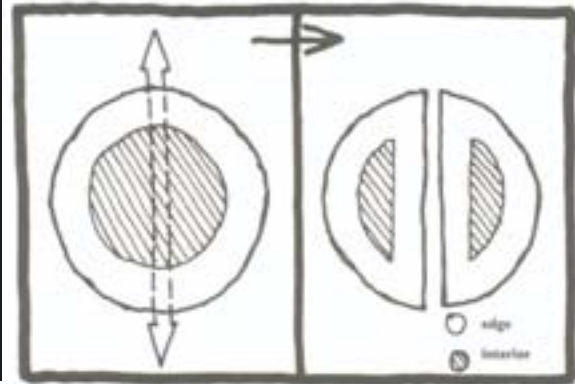
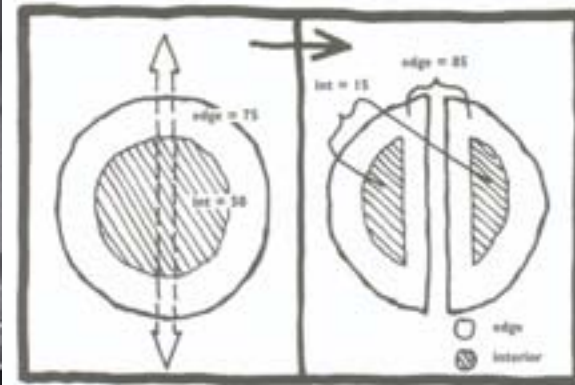
Landscape ecology is the ecology of large heterogenous areas, of land mosaics.

It is the spatial scale that explicitly integrates nature and humans.

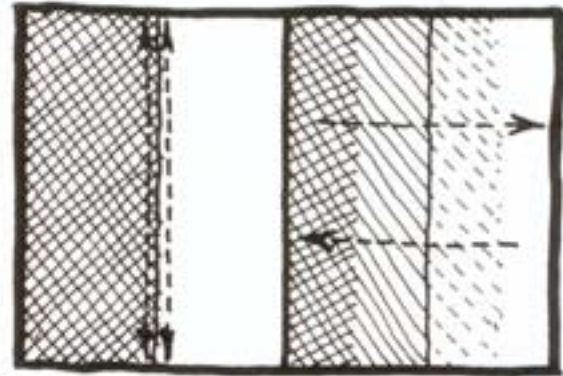
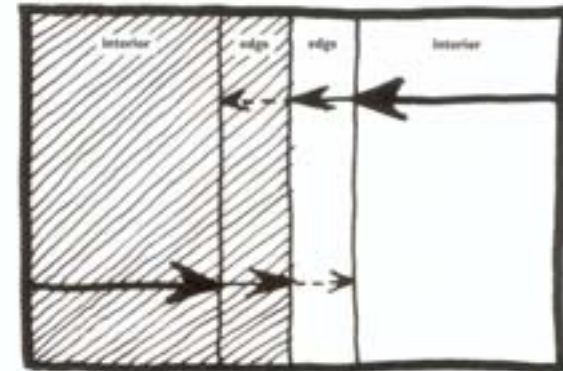
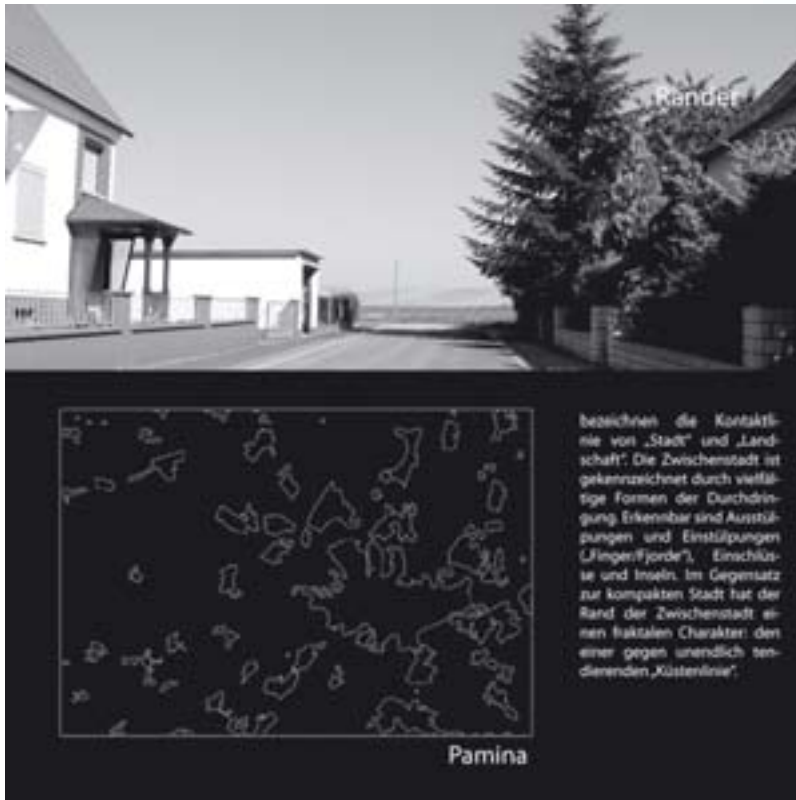
Patches	patches of plant and animal habitat
Edges	boundaries
Corridors	connectivity
Mosaics	network pattern and scale

Spatial pattern matters. Context is more important than content.

Clones - Patch, Zwischen_Stadt_Entwerfen + Landscape Ecology, T.T. Foreman



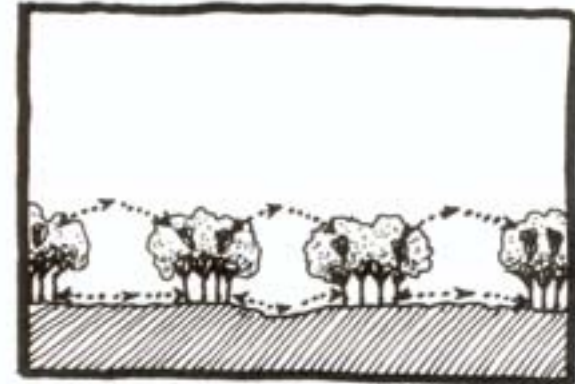
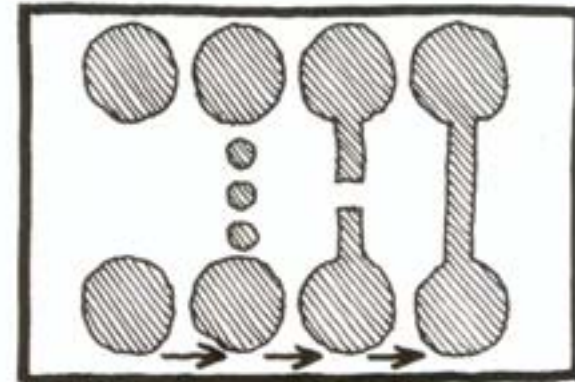
Edges, Zwischen_Stadt_Entwerfen + Landscape Ecology



Corridors, Zwischen_Stadt_Entwerfen + Landscape Ecology



außen-Infrastruktur- oder Bewegungslinien, welche den Raum in Längsrichtung verbinden und in Querrichtung trennen. Sie bezeichnen Straßen, Schienen, Fließgewässer, Hochspannungsleitungen. Die Anzahl von Kreuzungspunkten von 2 oder mehr Bändern bestimmt den Grad von Erschließung/ Vernetzung.



stba

Contemporary City

CYCLES

Flows + cycles

Solar cycle:

Sun radiation sets the bio-geochemical cycles into motion
(carbon, water, oxygen).

Industrialization + urbanization affect these flows and cycles.

GHG effect – warming due to anthropogenic release of stored (fossil) carbon.

Water cycle:

Evaporation/Verdunstung, Precipitation /Niederschlag, River course/Flussverlauf

Water: drop in water tables due to consumption + impervious surfaces;

Flood plain loss + channeling produce increasing river flooding.

Cycles

Water and Nutrient cycles

Global, regional and city water cycles

oceans

glaciers, groundwater, wetlands

consumption and depletion

Urban water and nutrient cycles as a linear system

depletion, dead zones, acid rain, sanitation and sewage

Urban water and nutrient cycles as a loop system

towards water neutrality, waste water as resource

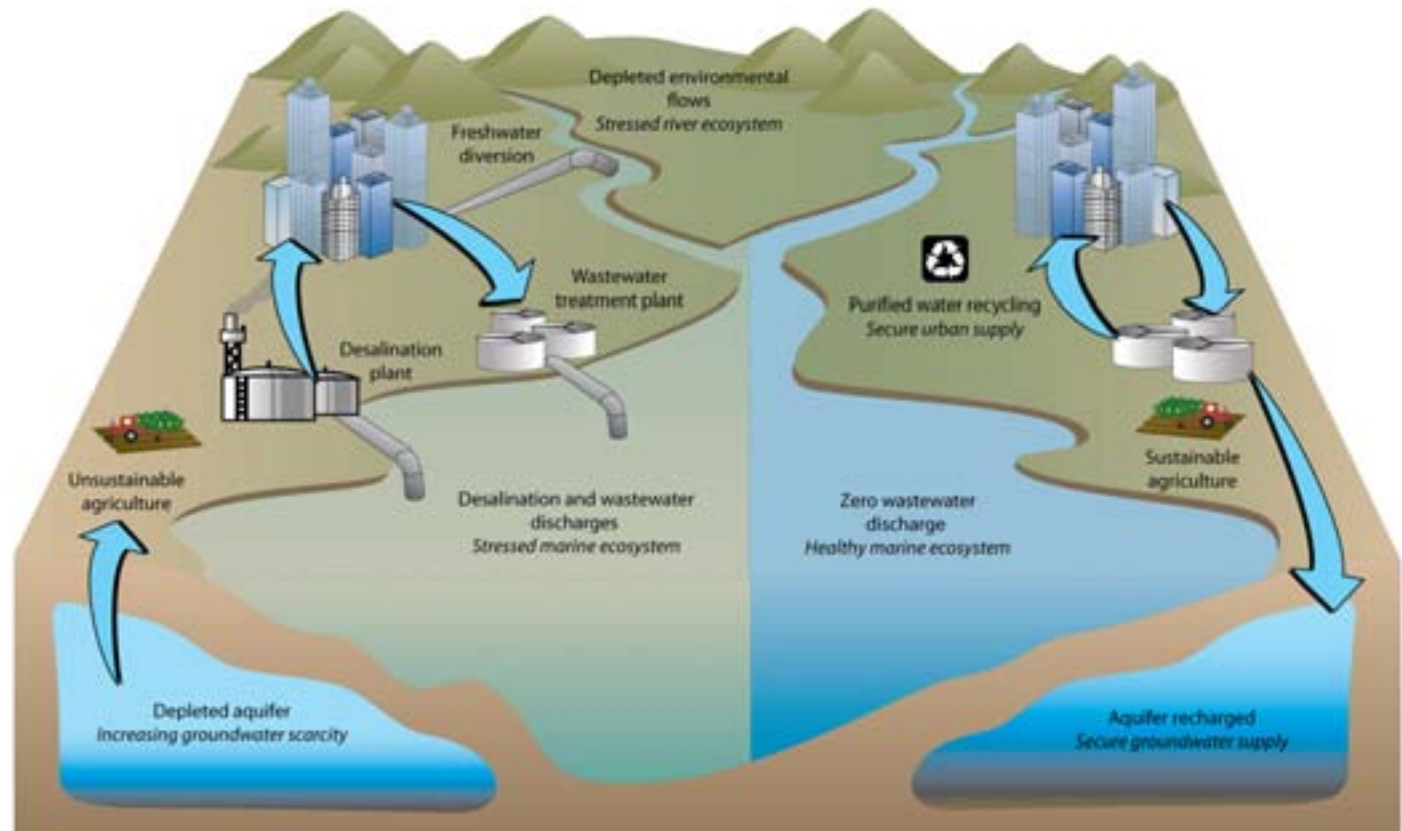
Creative water solutions

desalinization, seawater greenhouse, dew and fog harvest,

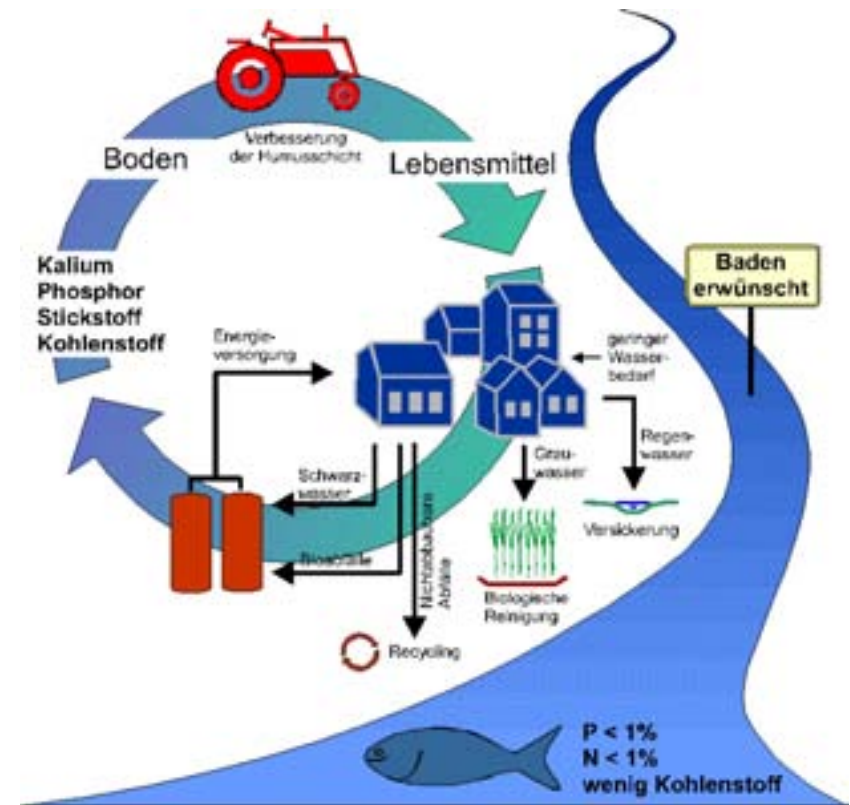
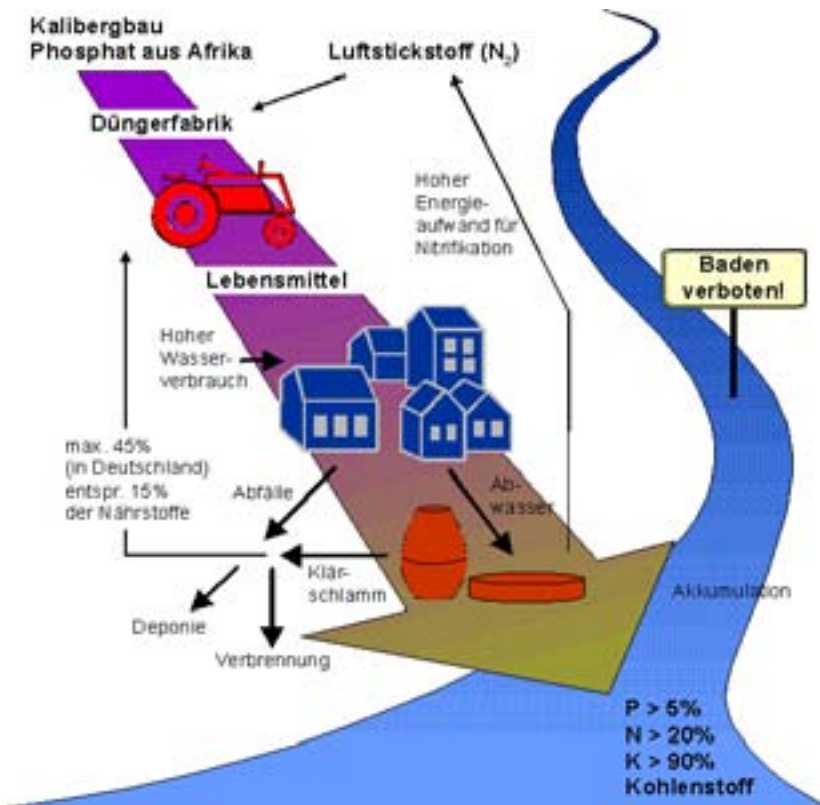
Water and nutrient cycles

Unsustainable

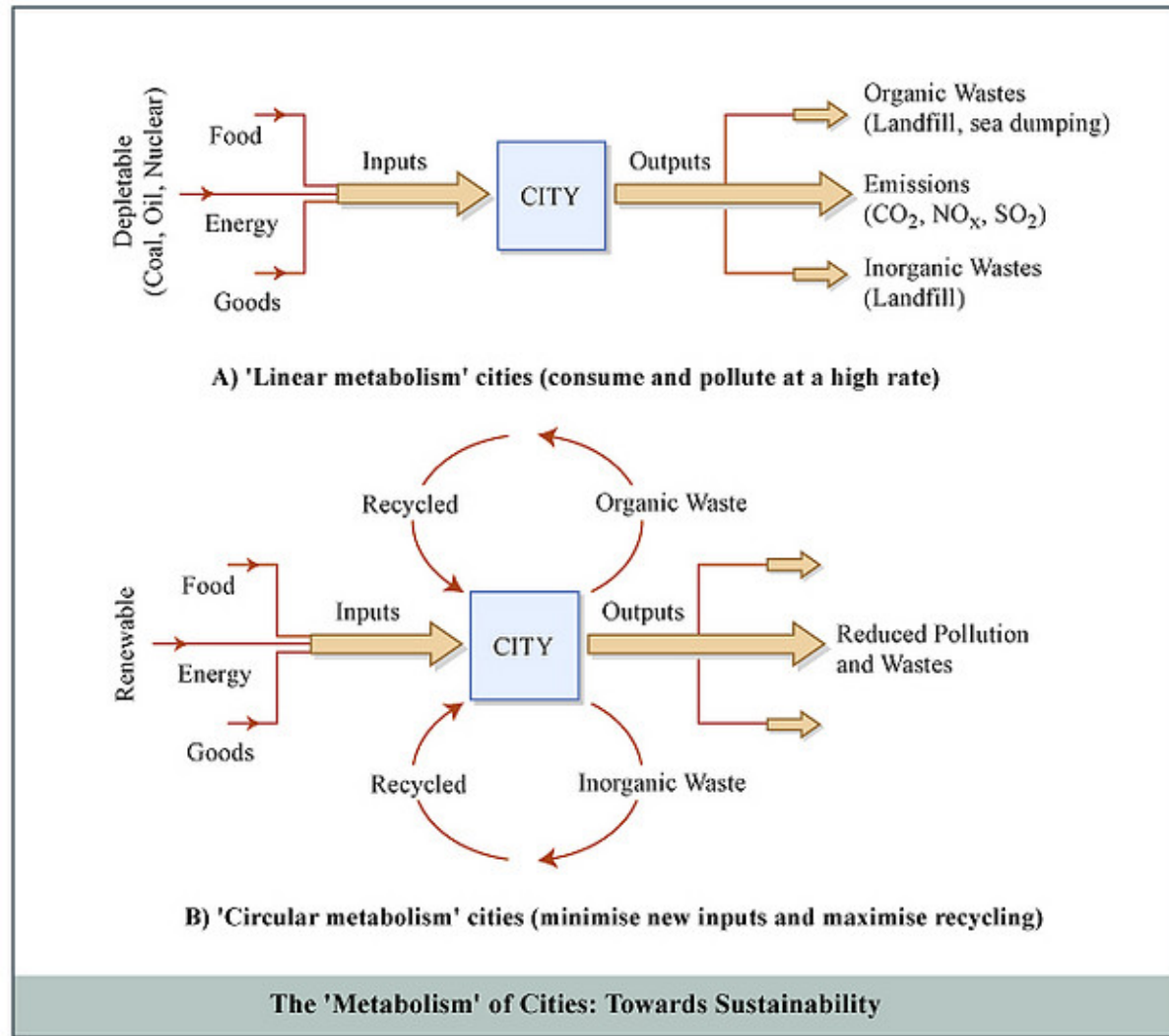
Sustainable



Comparison linear and circular metabolism,



„Metabolism“ of Cities



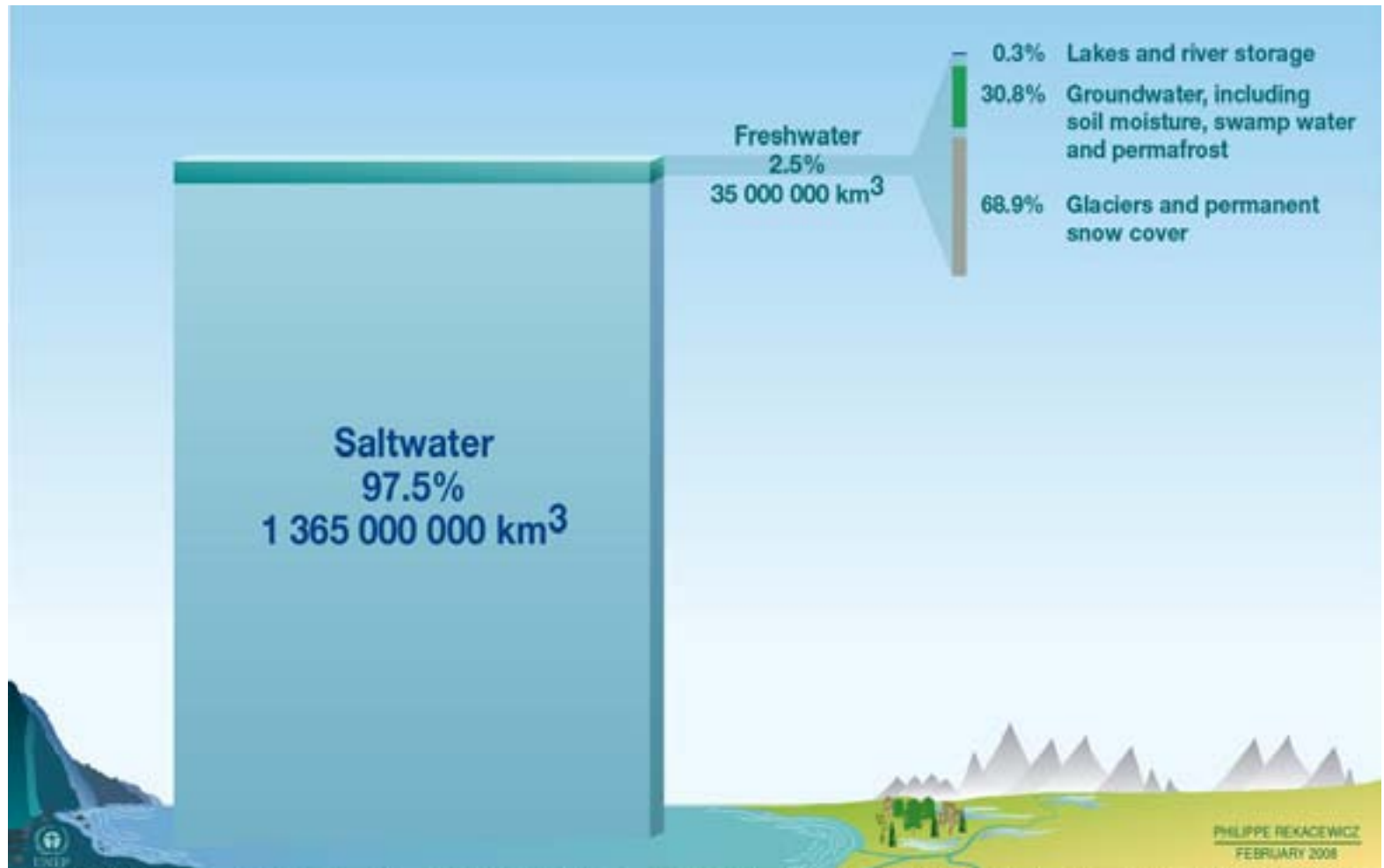
I Natural water and nutrient cycle

Global water cycle

Regional water cycle

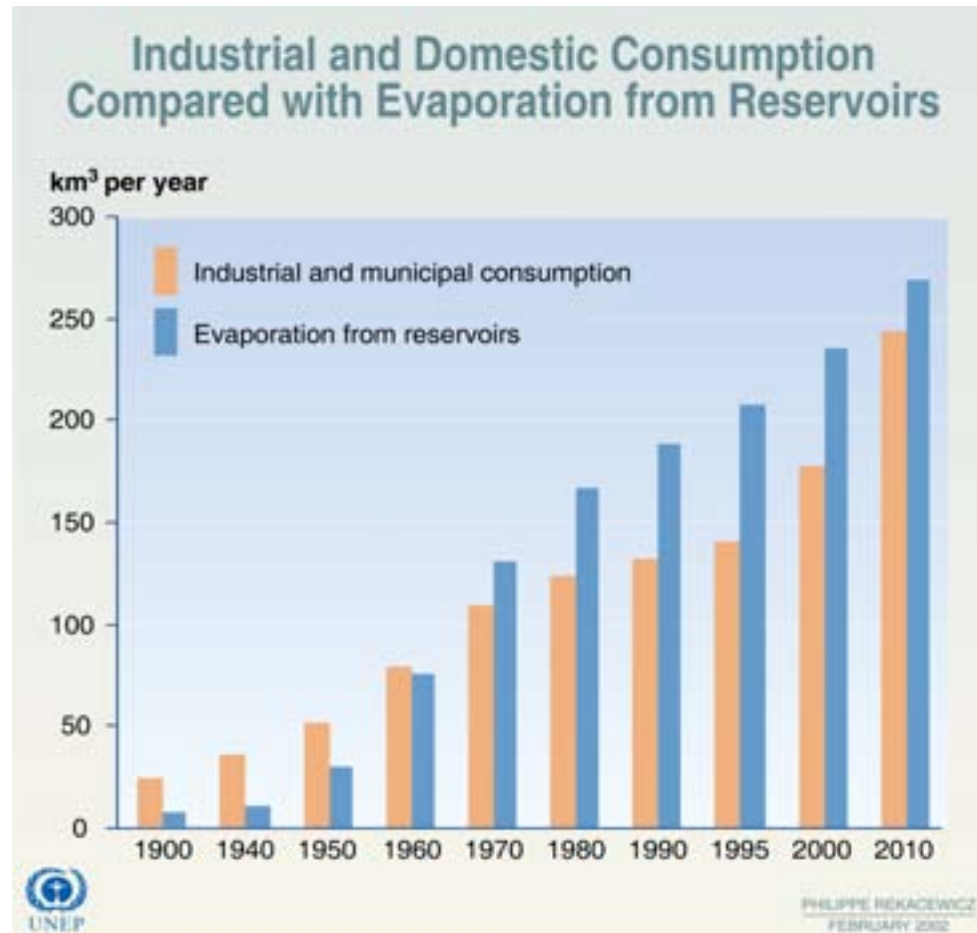
Nutrient cycling

Global water



Source: Igor A. Shiklomanov, State Hydrological Institute (SHI, St. Petersburg) and United Nations Educational, Scientific and Cultural Organisation (UNESCO, Paris), 1999.

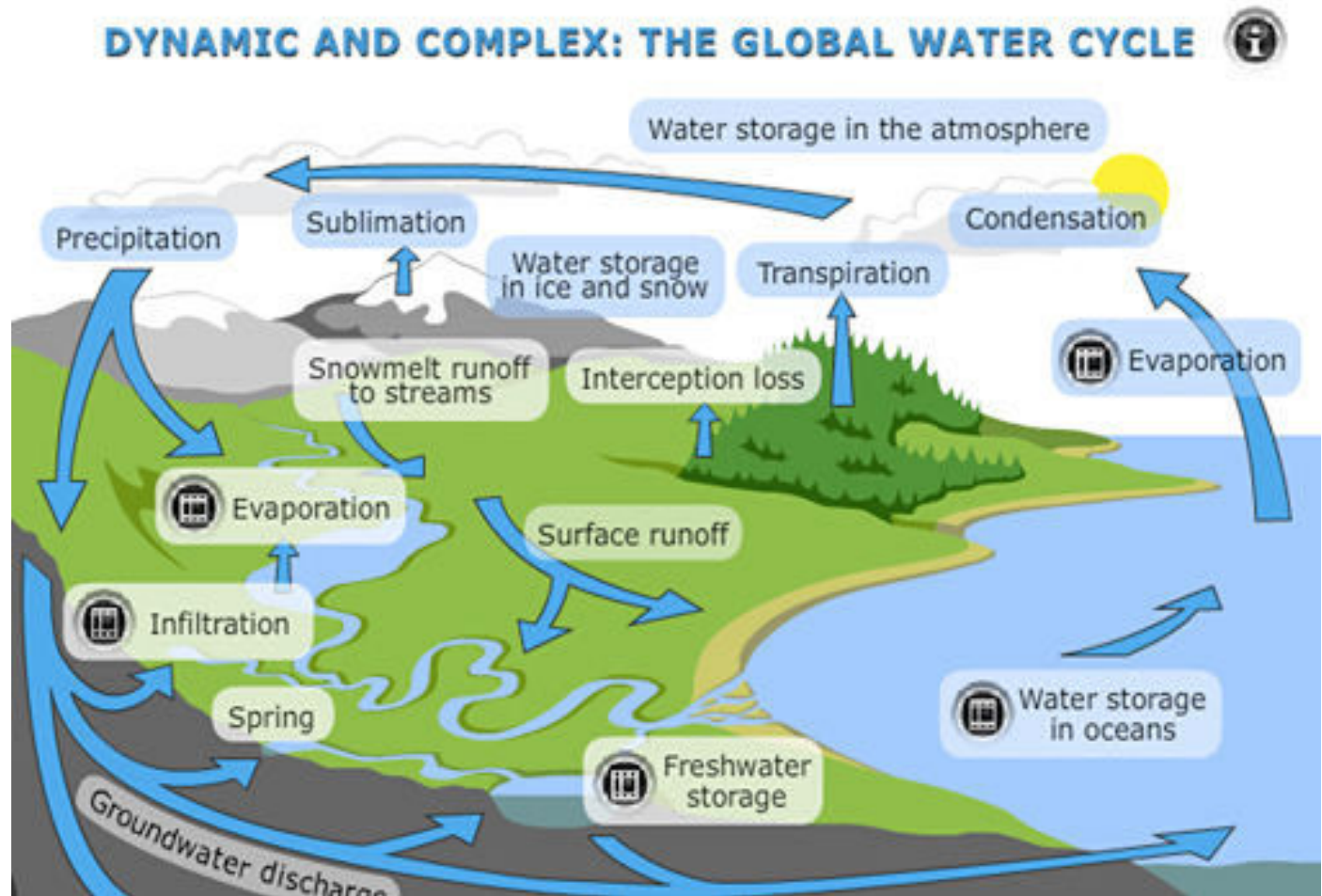
Global water cycle



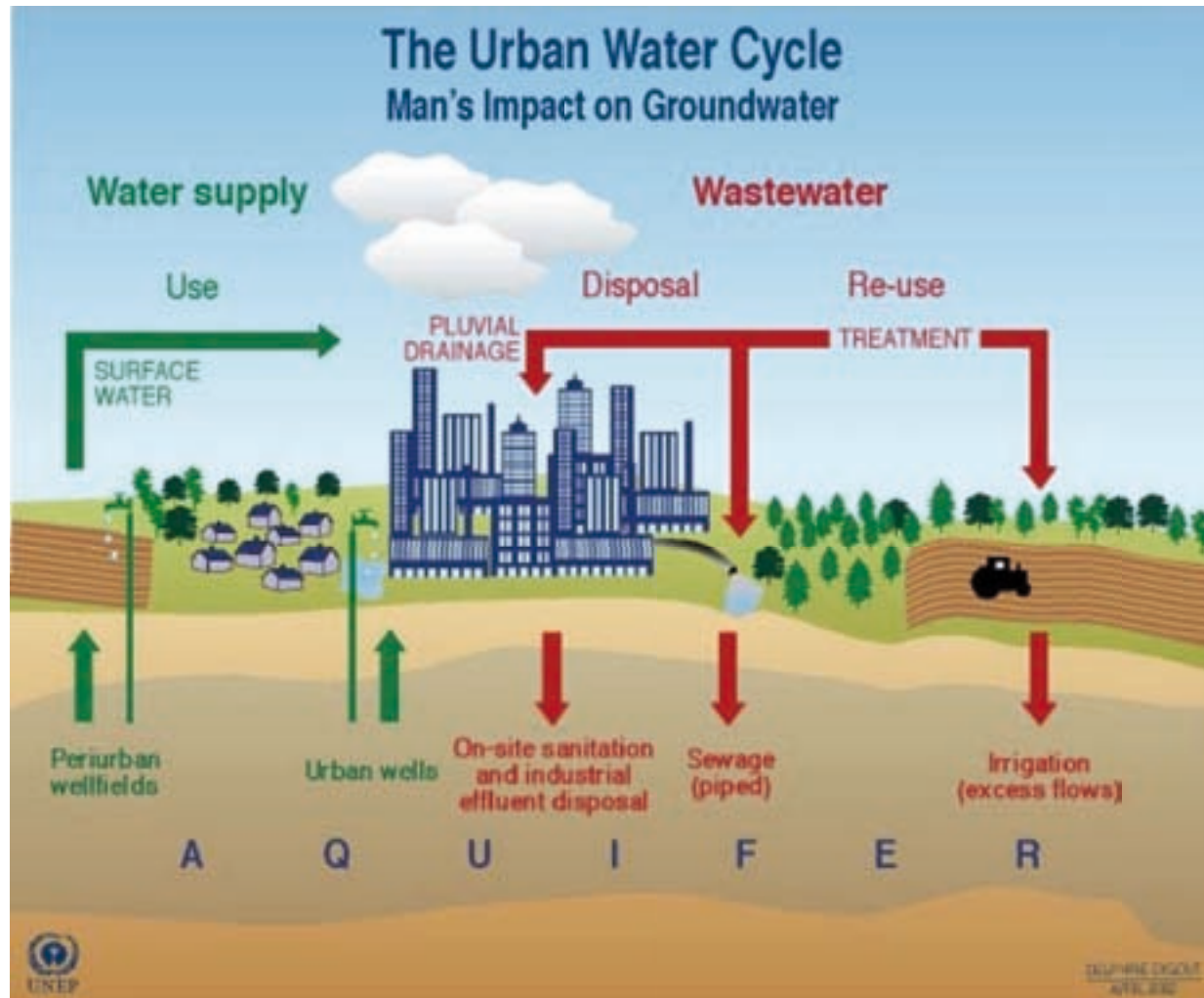
Source: Igor A. Shiklomanov, State Hydrological Institute (SHI, St. Petersburg) and United Nations Educational, Scientific and Cultural Organisation (UNESCO, Paris), 1999.

Global water cycle

DYNAMIC AND COMPLEX: THE GLOBAL WATER CYCLE

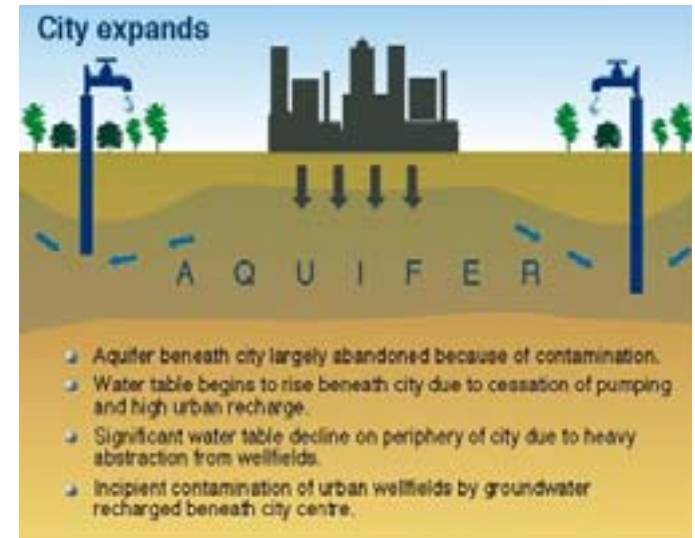
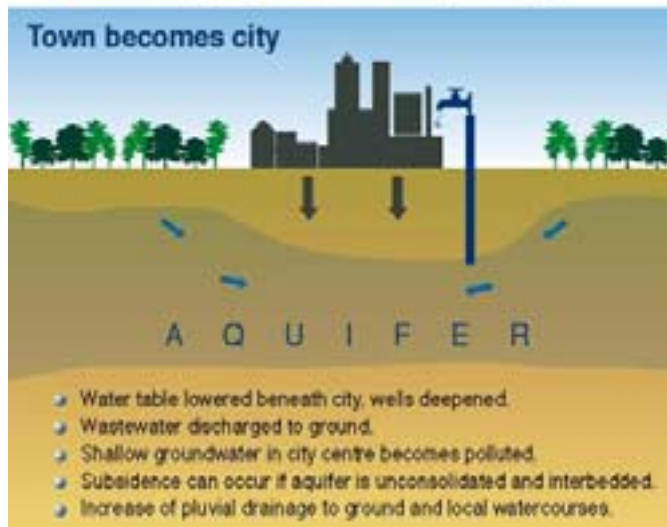
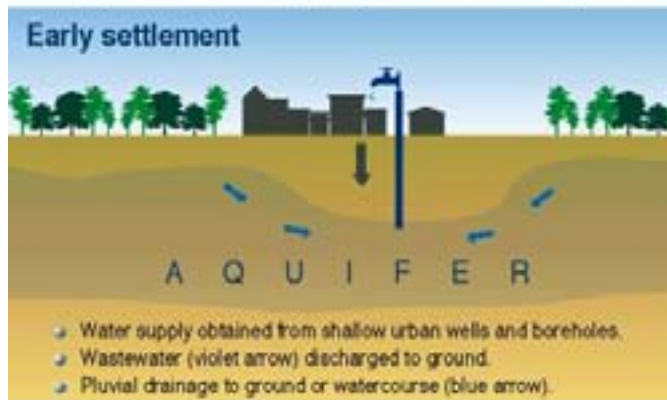


Urban Water Cycle

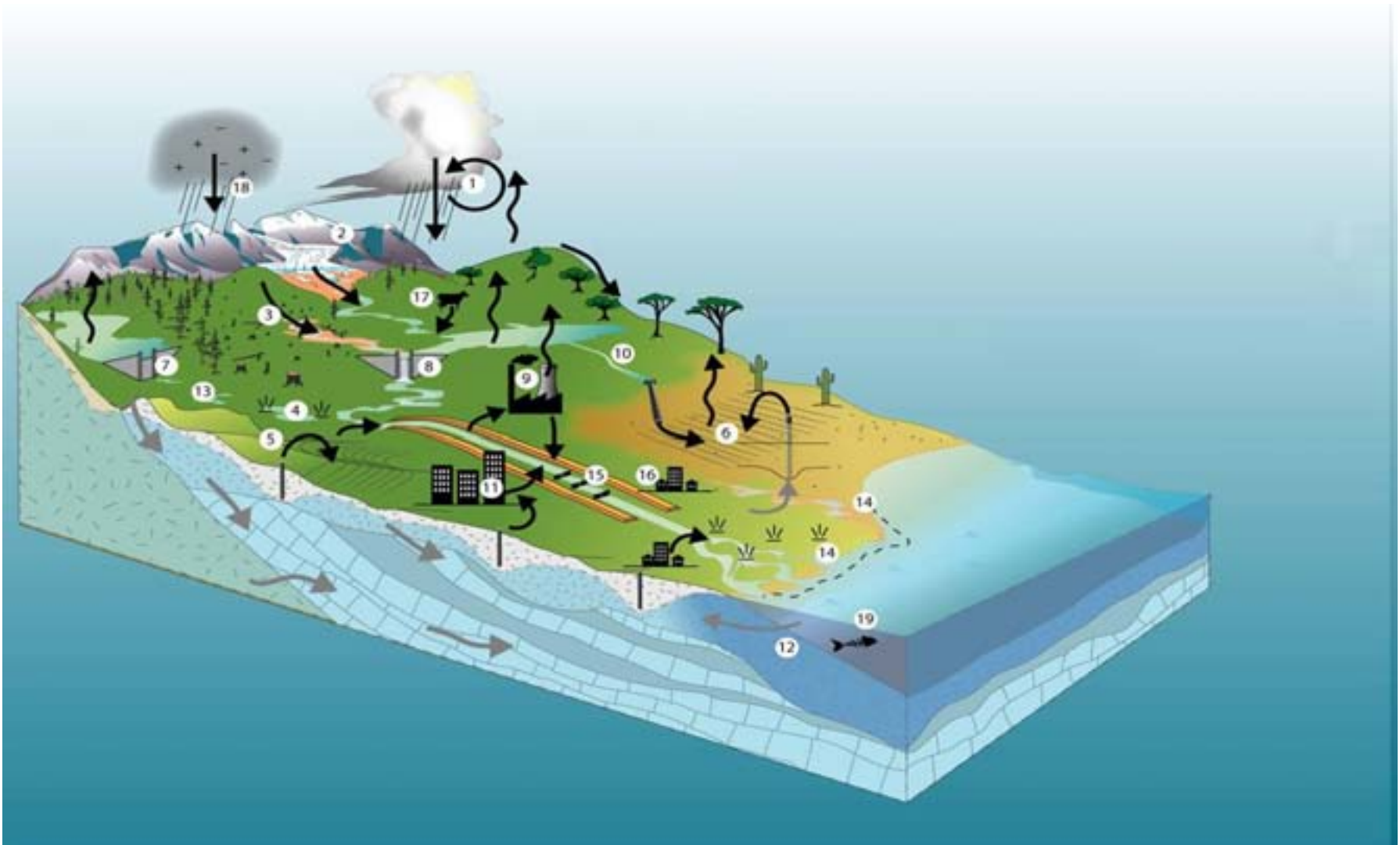


Regional water cycle

Evolution of Water Supply and Wastewater Disposal Impact of a Growing City on a Shallow Aquifer



Regional water cycle



II Urban water cycle as linear system- opening cycles

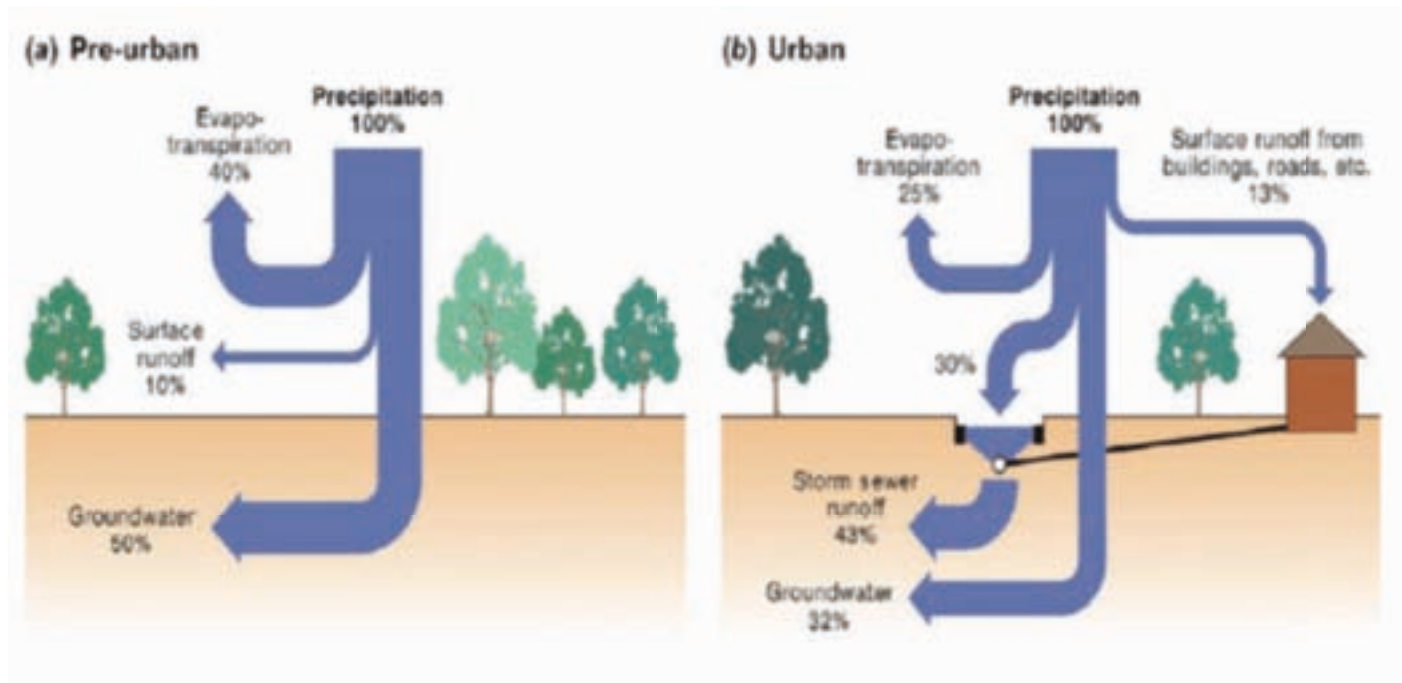
Seal or gutter?

Have plenty?

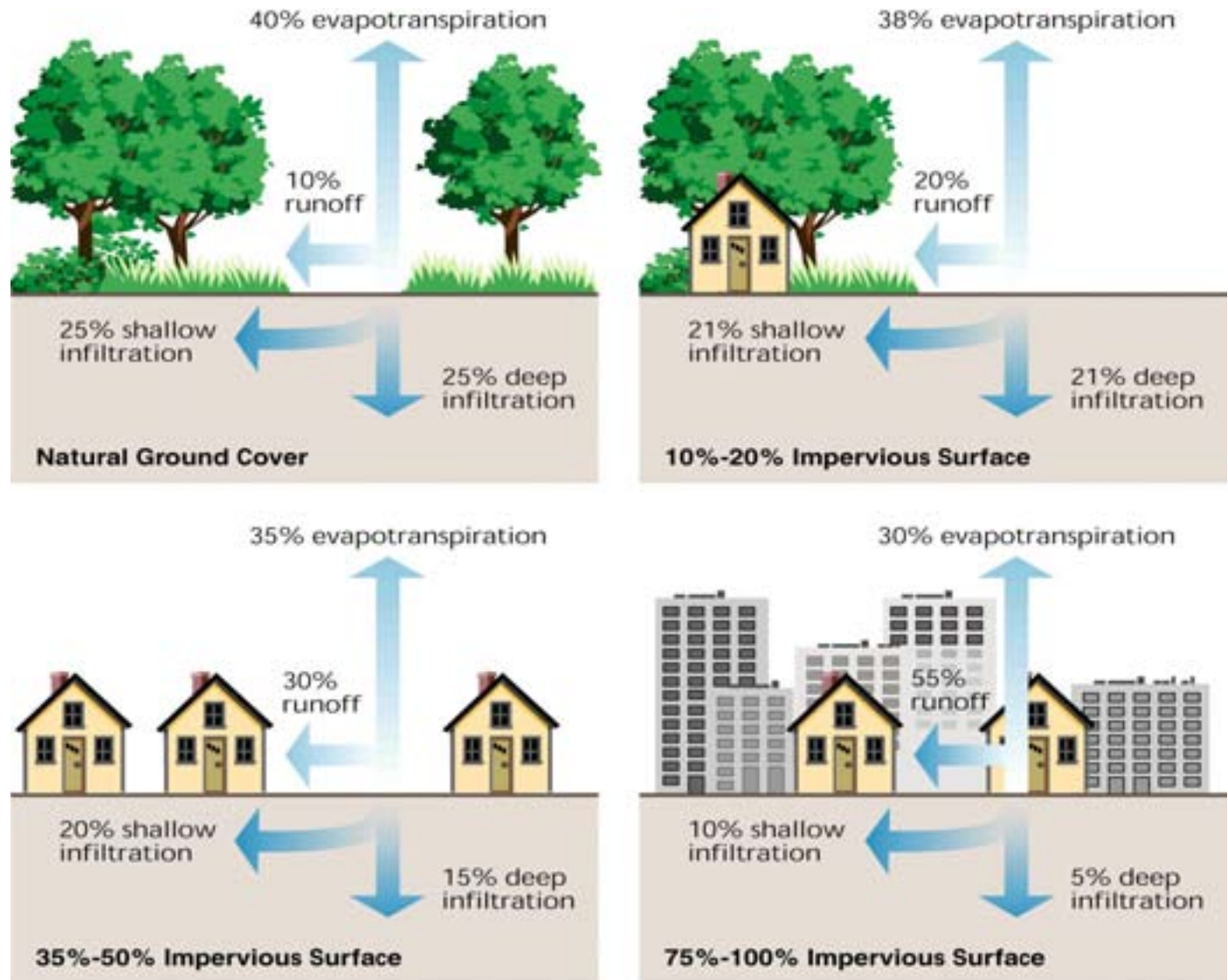
Get rid off?

Regulate and control?

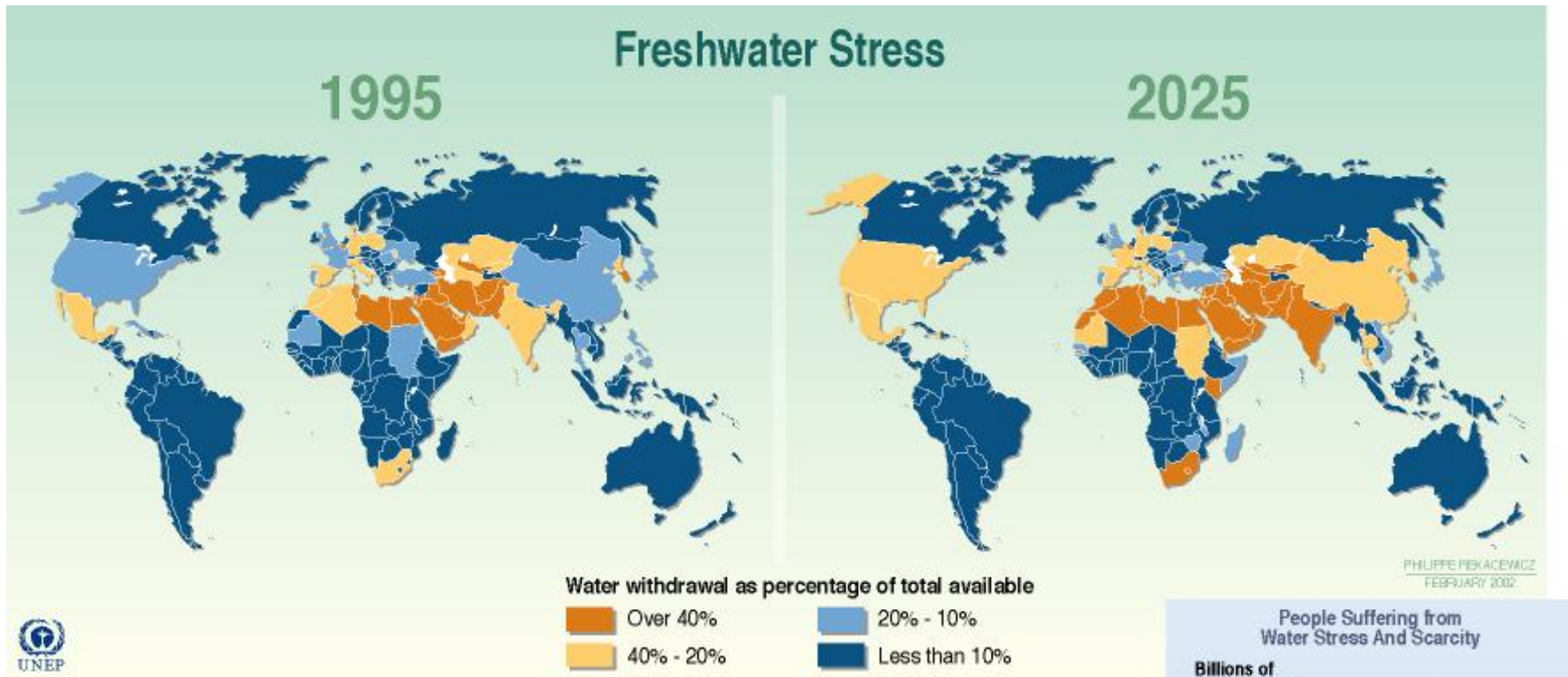
Seal or gutter?



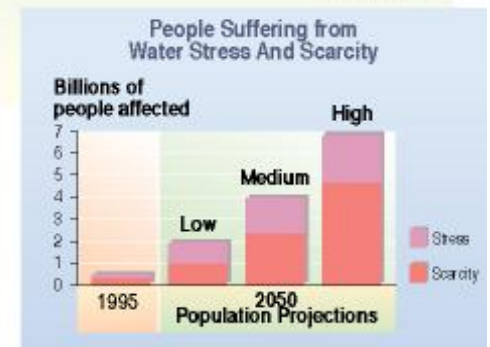
Seal or gutter?



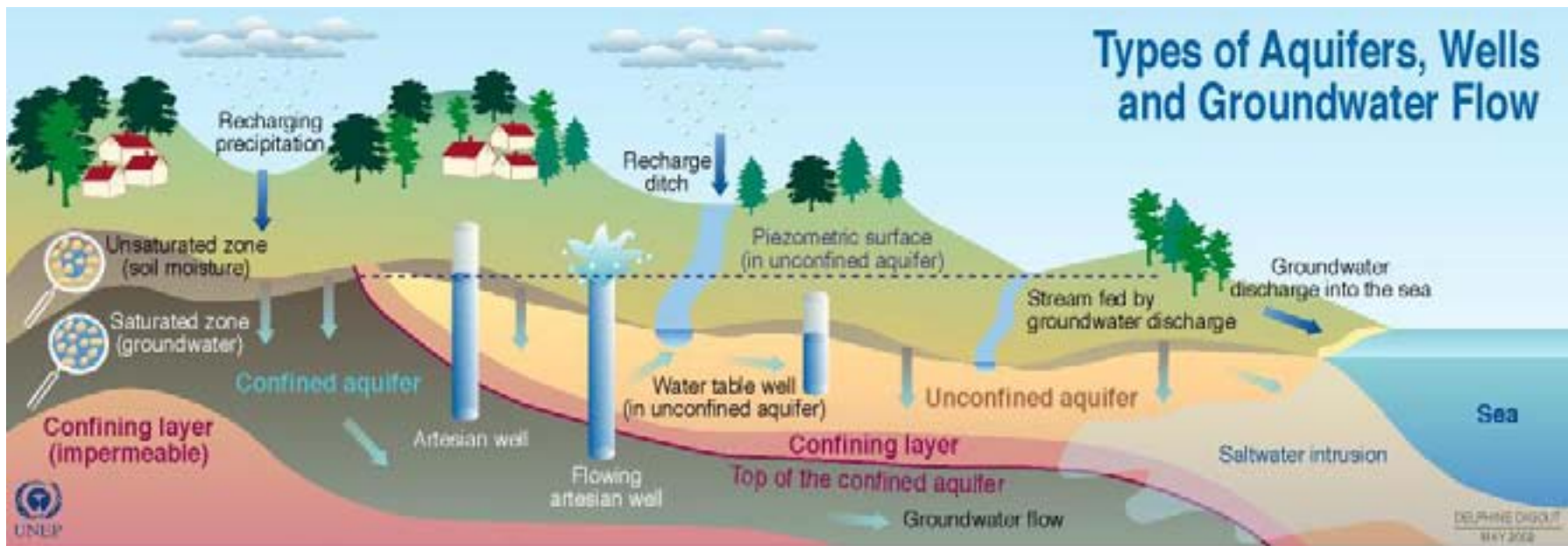
Have plenty?



Source: World Meteorological Organisation (WMO), Geneva, 1996; Global Environment Outlook 2000 (GEO), UNEP, Earthscan, London, 1999.



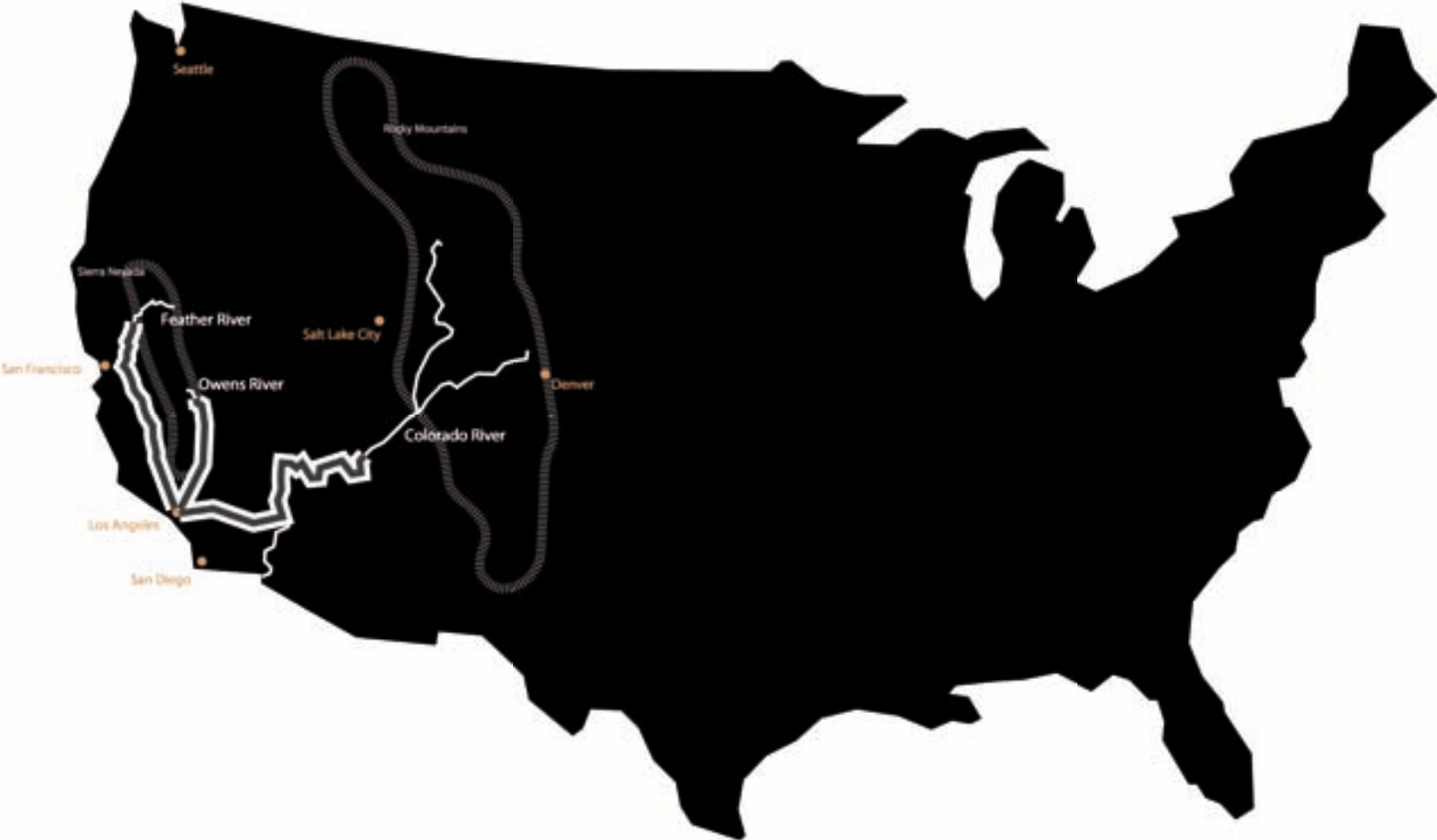
Have plenty?



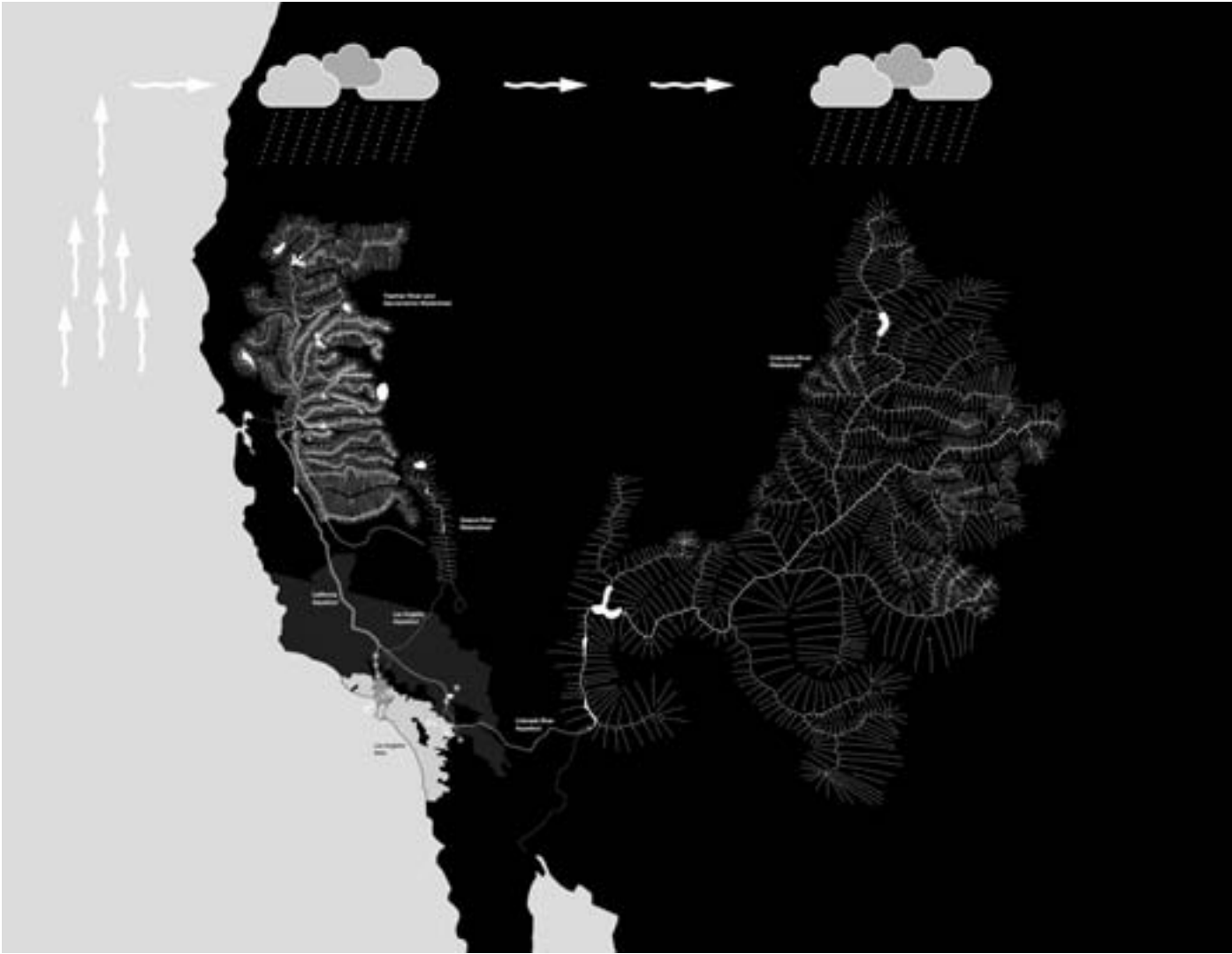
Source: Environment Canada, 2001 (Adapted from: <http://www.ec.ca/water/index.htm>)

Los Angeles Water, SMAQ

Los Angeles Water, SMAQ



Los Angeles Water, SMAQ



Los Angeles Water, SMAQ



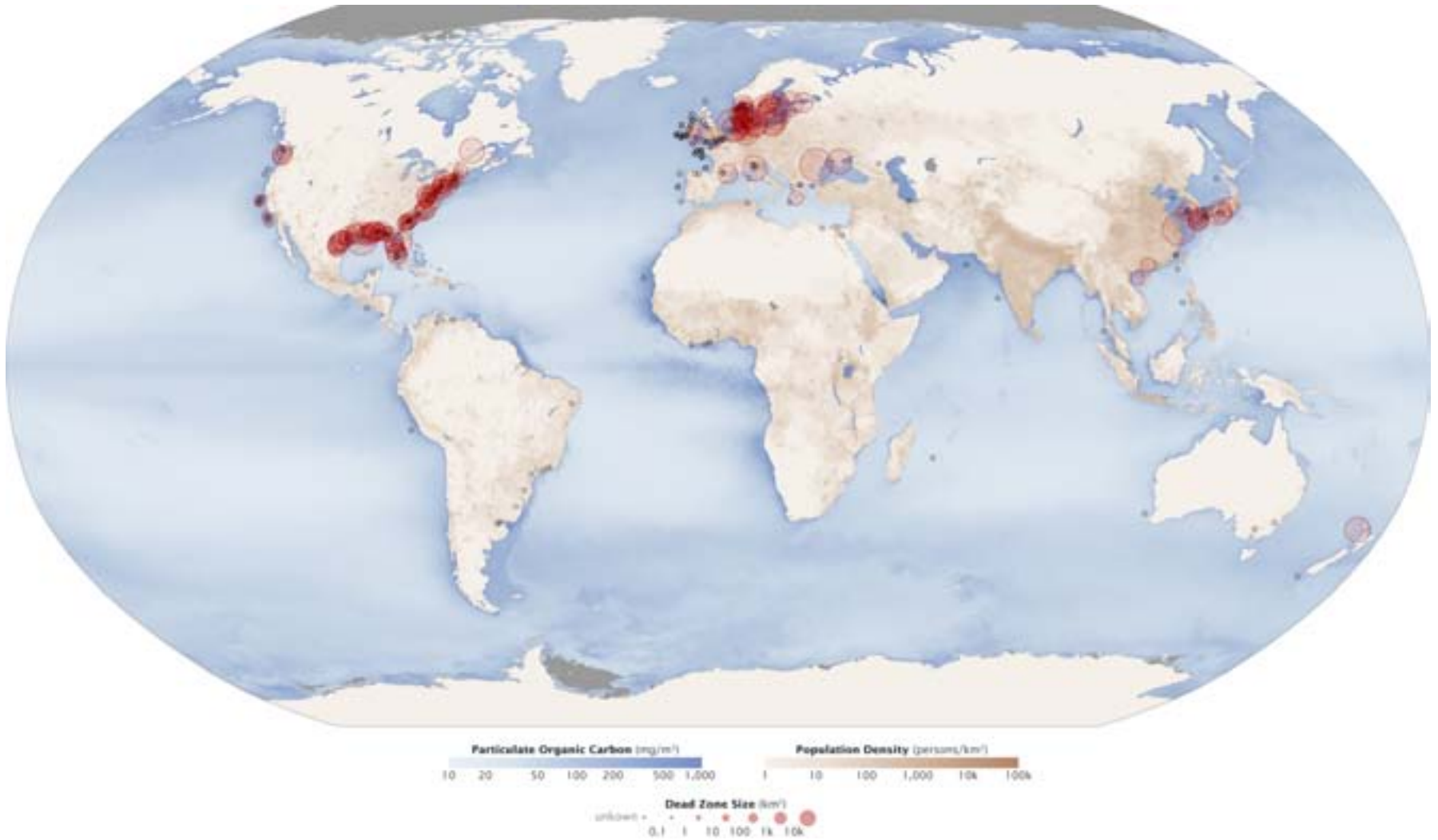
Los Angeles Water, SMAQ



Los Angeles Water, SMAQ



Get rid off? – Aquatic dead zones

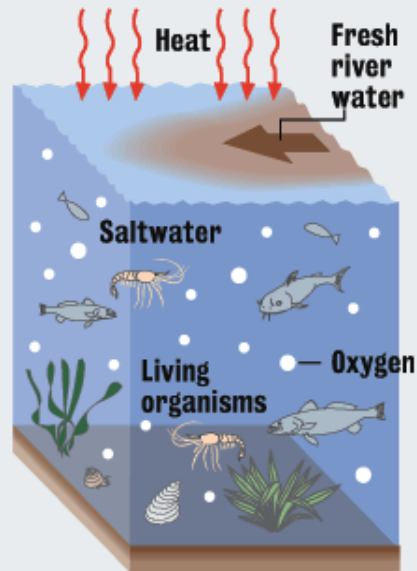


Nutrient cycling



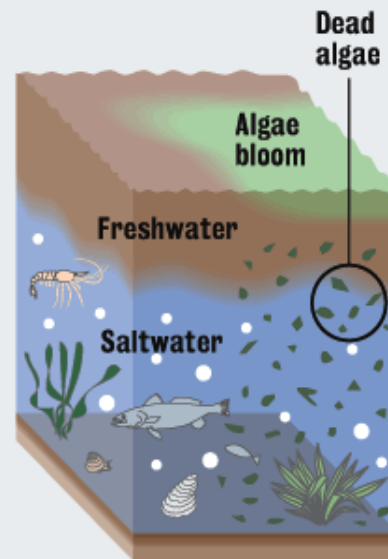
Get rid off? – Aquatic dead zones

HOW THE DEAD ZONE FORMS

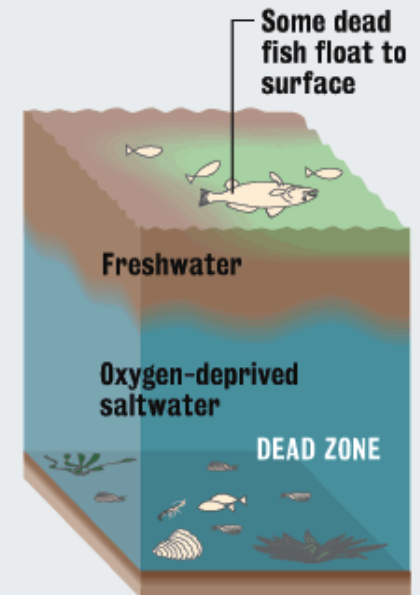


1 During the spring, sun-heated freshwater runoff from the Mississippi River creates a barrier layer in the Gulf, cutting off the saltier water below from contact with oxygen in the air.

Source: Staff research



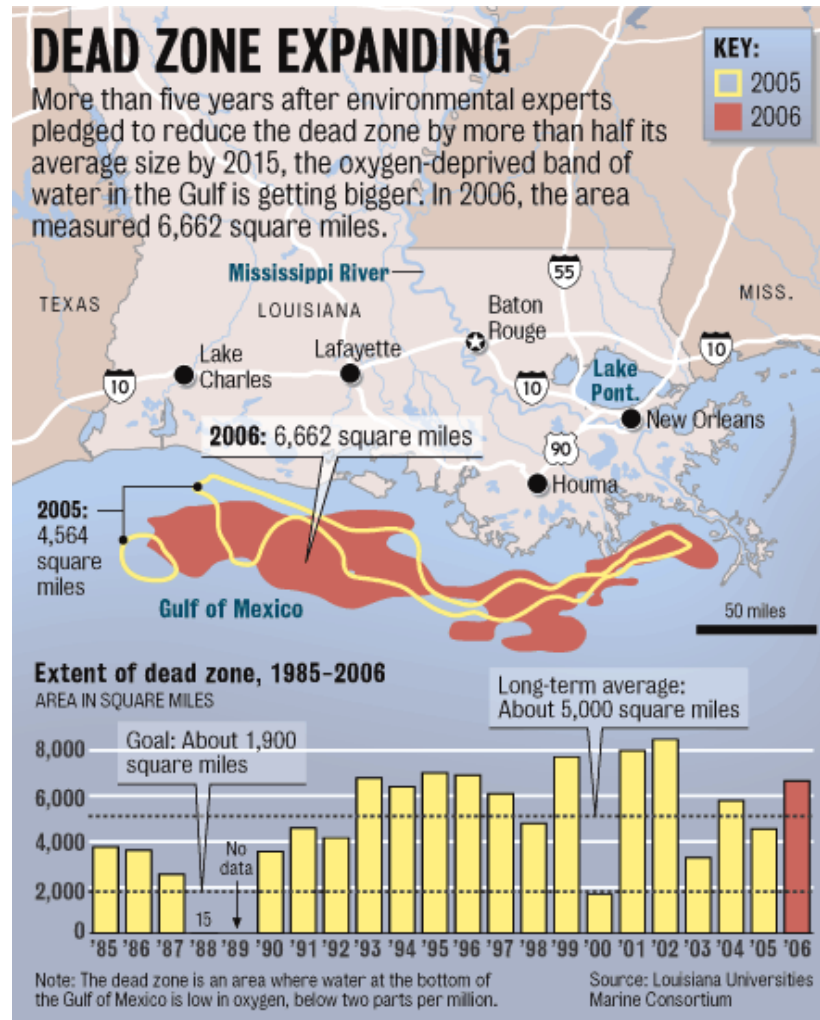
2 Nitrogen and phosphorus from fertilizer and sewage in the freshwater layer ignite huge algae blooms. When the algae die, they sink into the saltier water below and decompose, using up oxygen in the deeper water.



3 Starved of oxygen and cut off from resupply, the deeper water becomes a dead zone. Fish avoid the area or die in massive numbers. Tiny organisms that form the vital base of the Gulf food chain also die. Winter brings respite, but spring runoffs start the cycle anew.

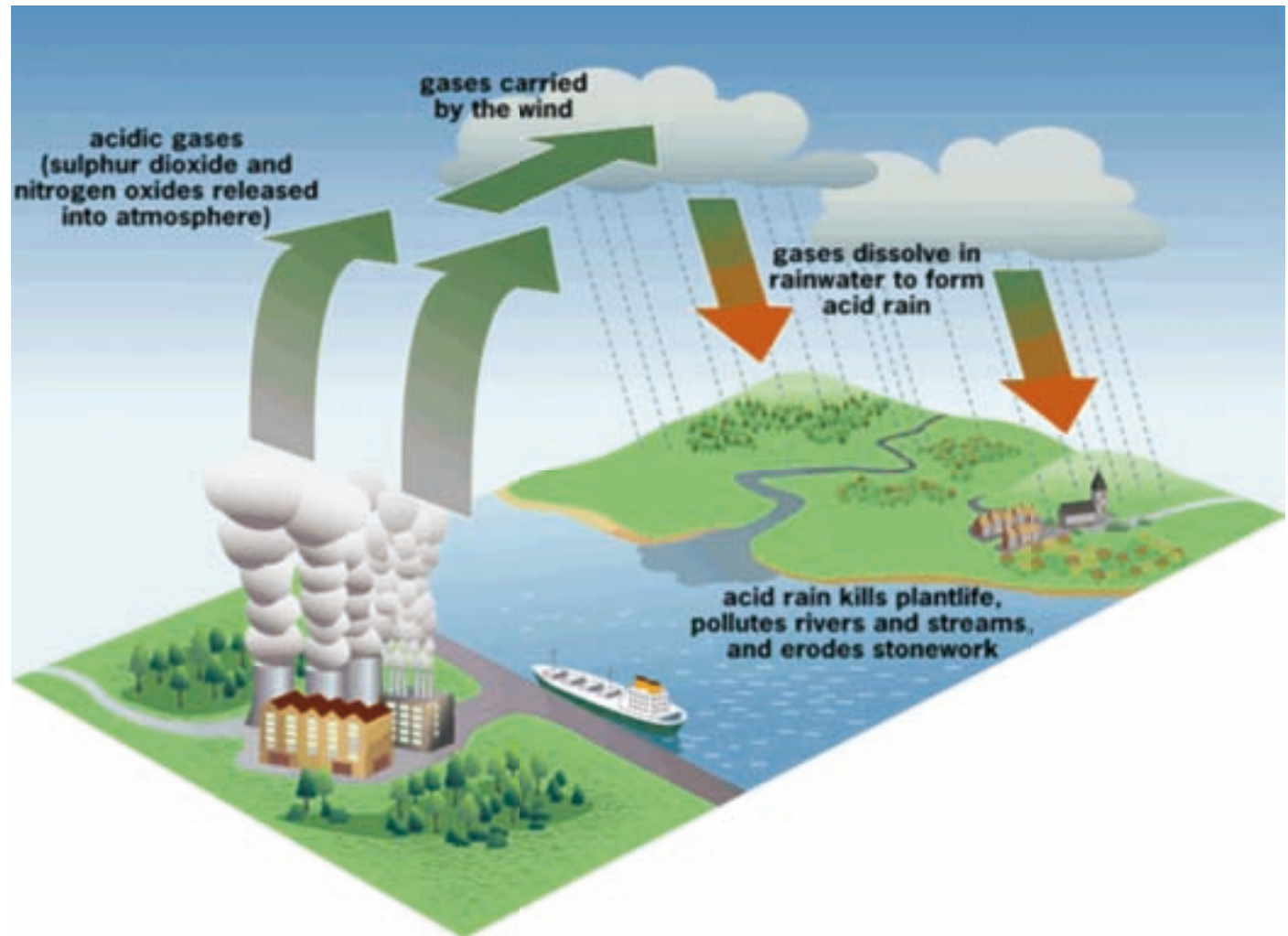
STAFF GRAPHIC BY DAN SWENSON

Get rid off? – Aquatic dead zones

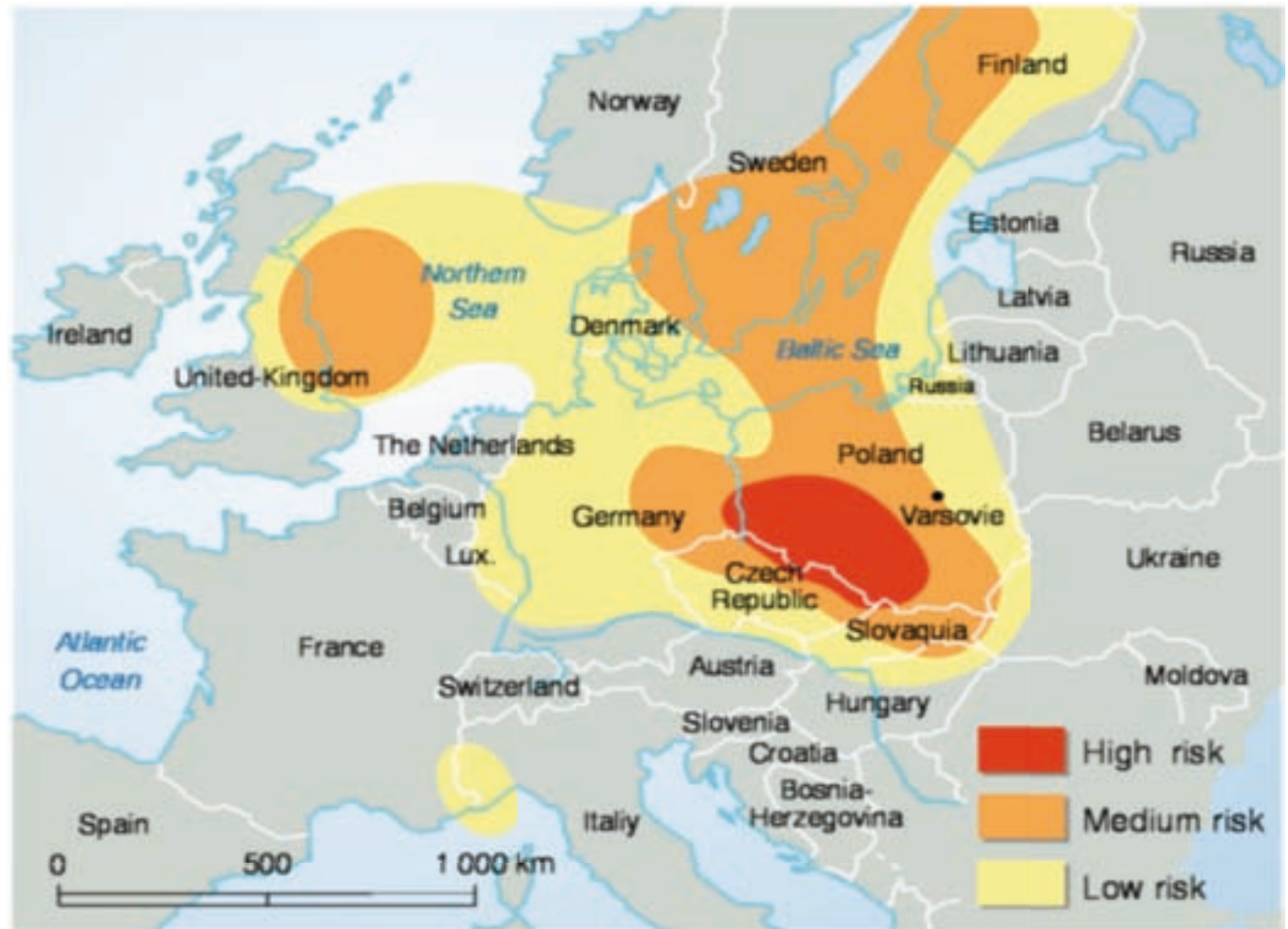


STAFF GRAPHIC BY DAN SWENSON

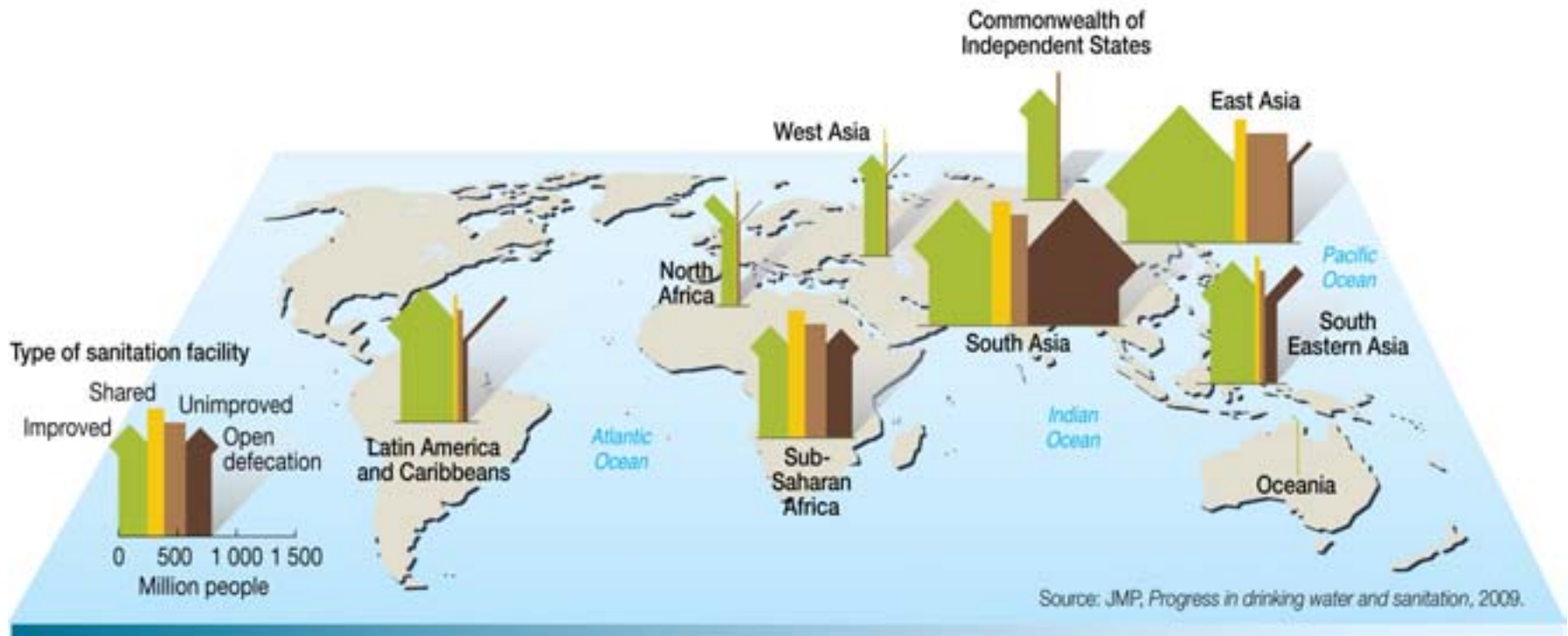
Get rid off? – Acid rain



Get rid off? – Acid rain



Get rid off? – Access to sanitation facilities



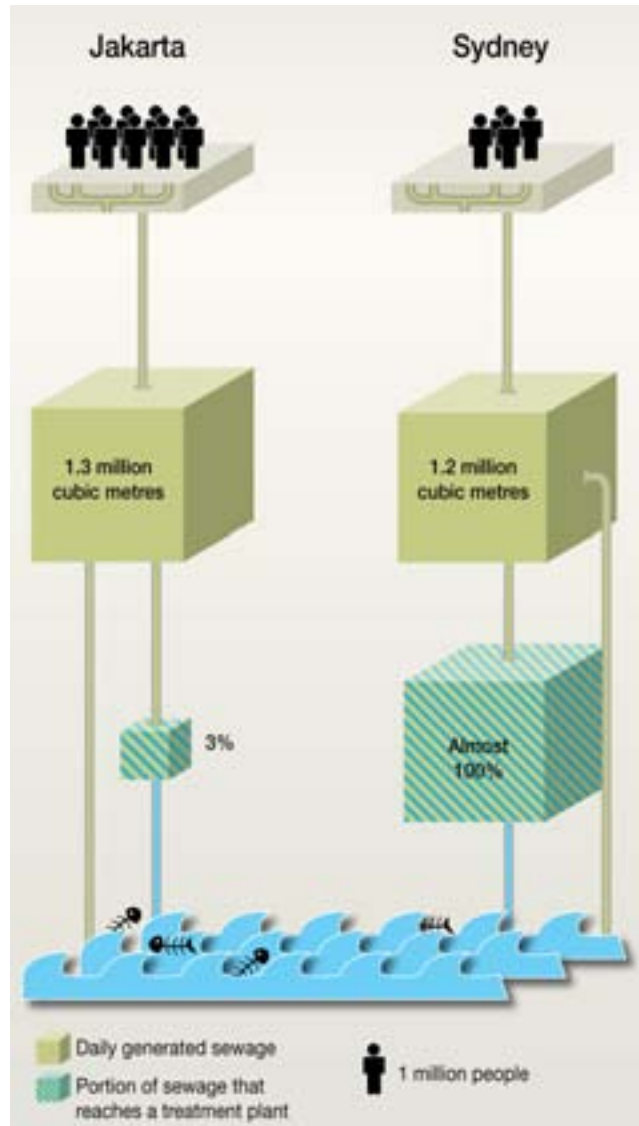
Improved: facilities that ensure hygienic separation of human excreta from human contact. Includes connection to a piped sewer system, septic tank, or pit latrines.

Shared: Sanitation facilities of an otherwise acceptable type shared between two or more households.

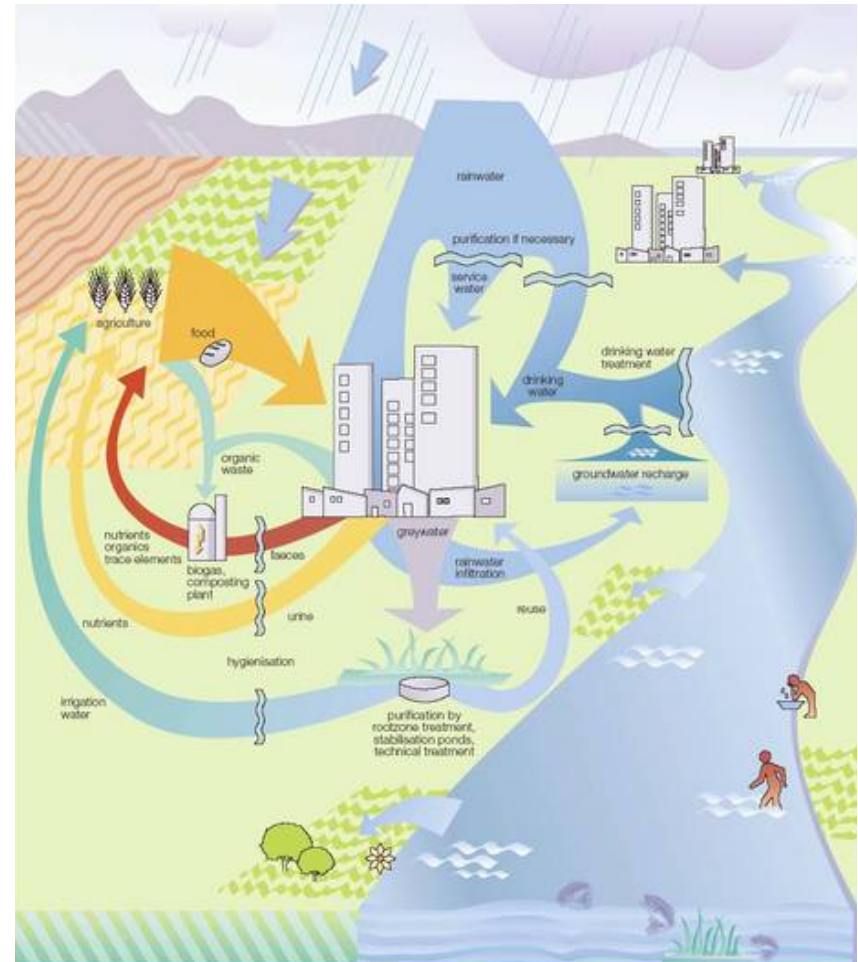
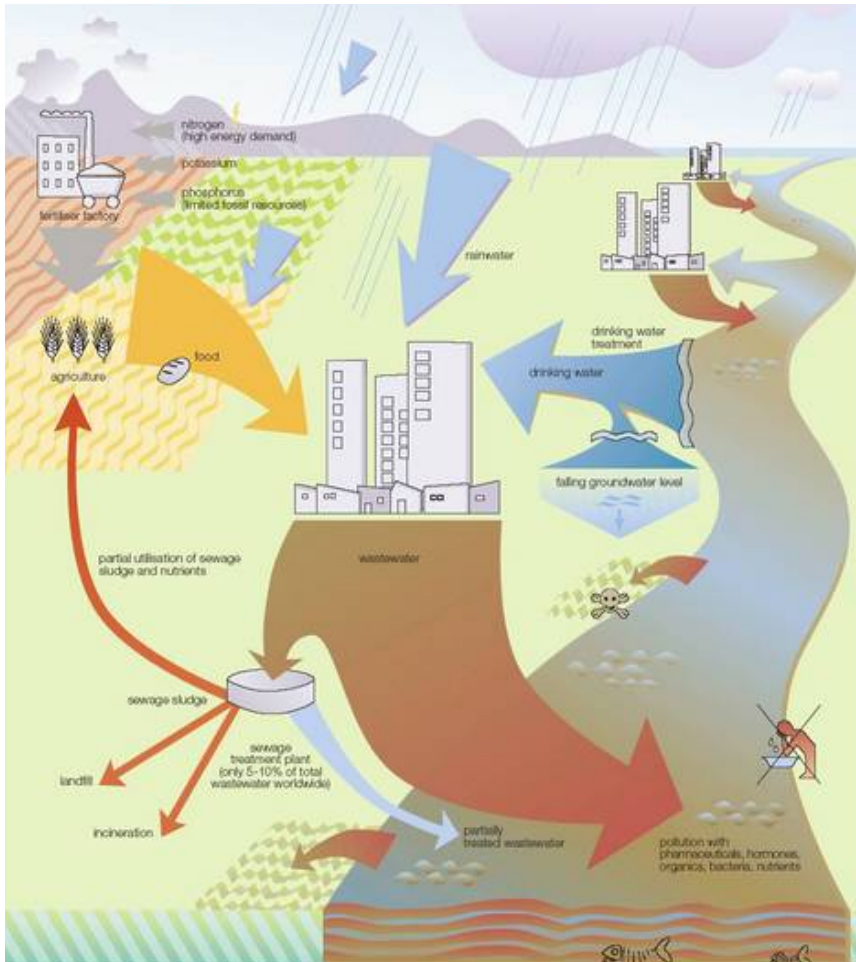
Unimproved: Facilities that do not ensure hygienic separation of human excreta from human contact

Open defecation: in fields, forests, bushes, bodies of water or other open spaces, or disposal of human faeces with solid waste.

Get rid off? – Sanitation sewage and treatment in big cities



Closing the loop in wastewater management and sanitation



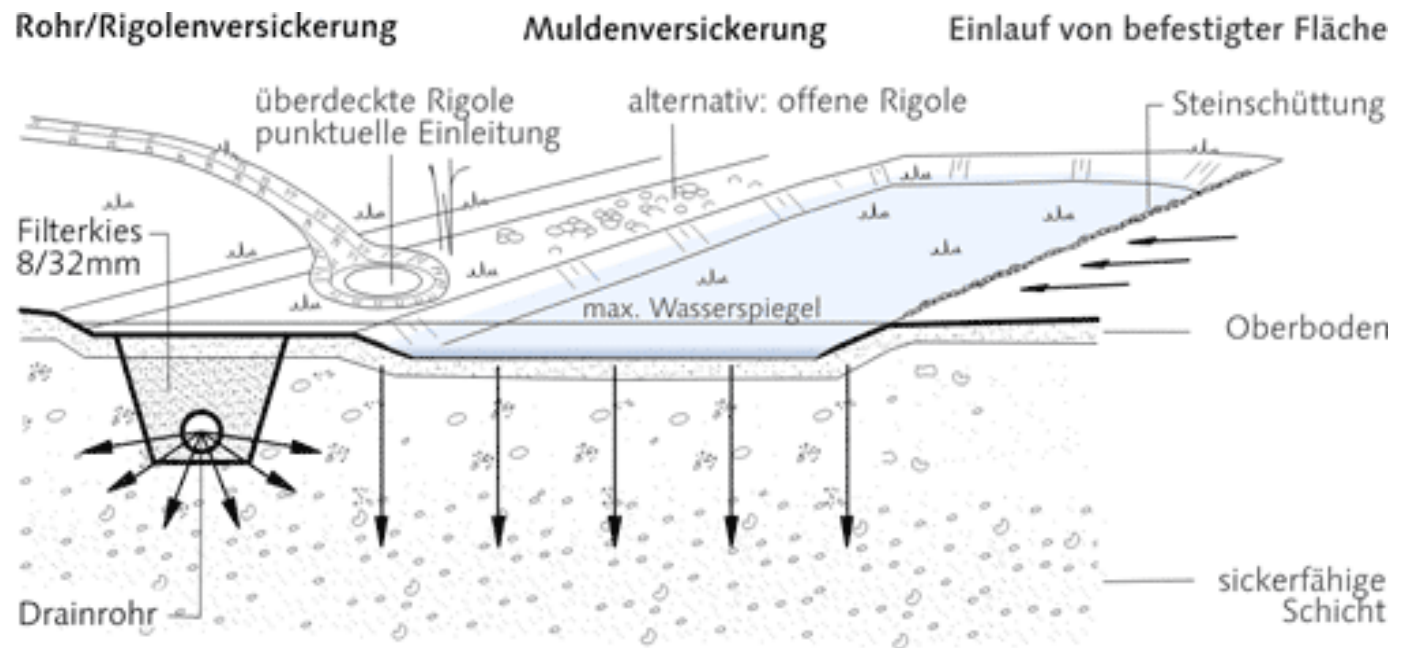
III Urban water and nutrient cycles as a looped system

Parks not pipes!

Use the local!

Waste water as resource!

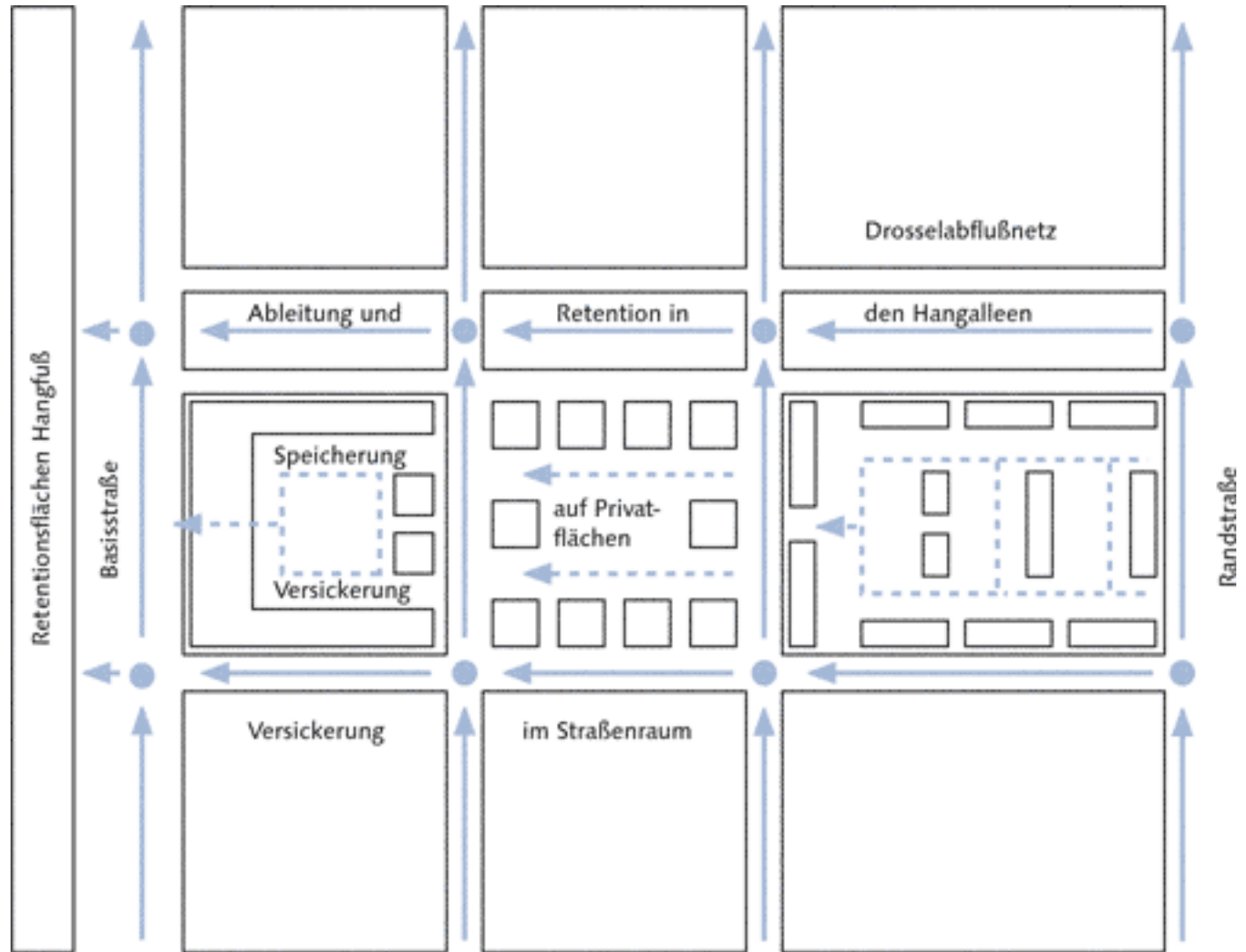
Parks not pipes!



Parks not pipes!



Parks not pipes!



Parks not pipes!



IV Creative water solutions: expanding water resources

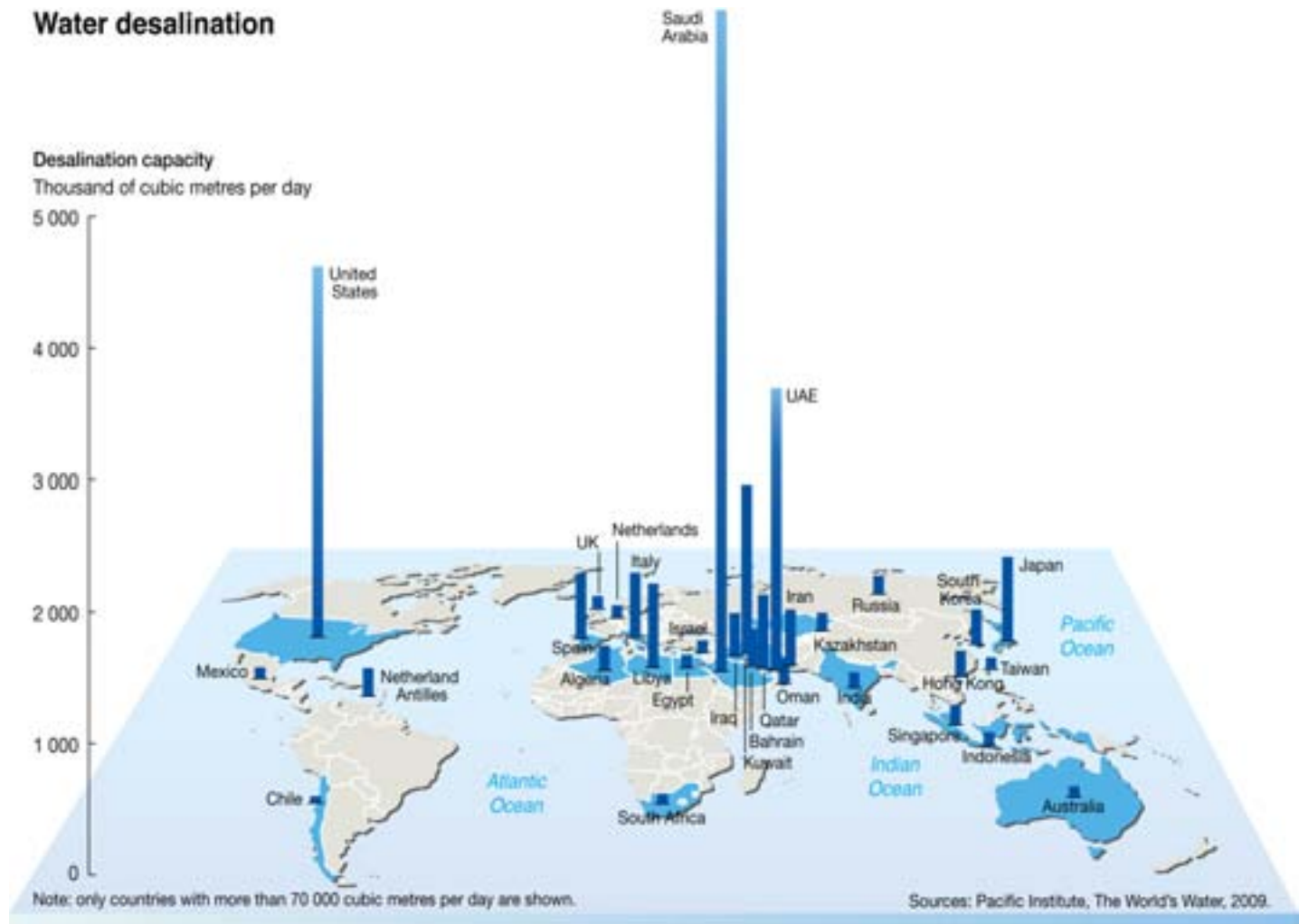
Salt water greenhouse

Desert dew harvesting

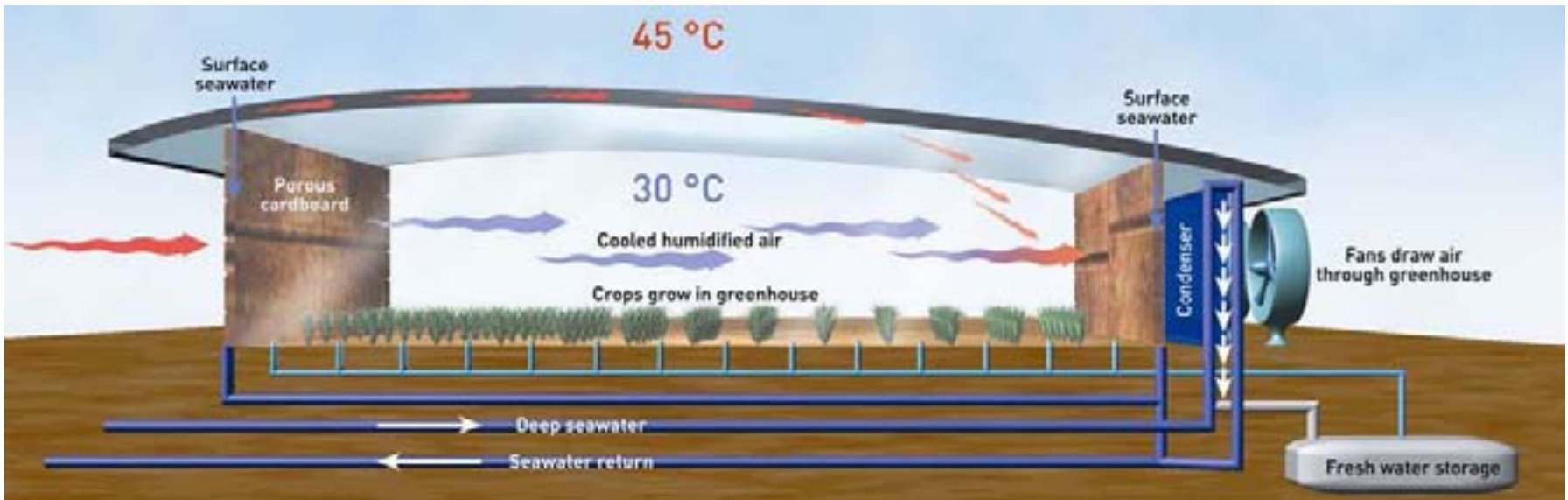
Evapotranspiration in closed greenhouse

Fog harvesting

Water desalination



Seawater greenhouse



Seawater greenhouse



Coastal Fog Tower, Atacama

Huasco River valley, Chile
Iberto Fernandez / Susana Ortega

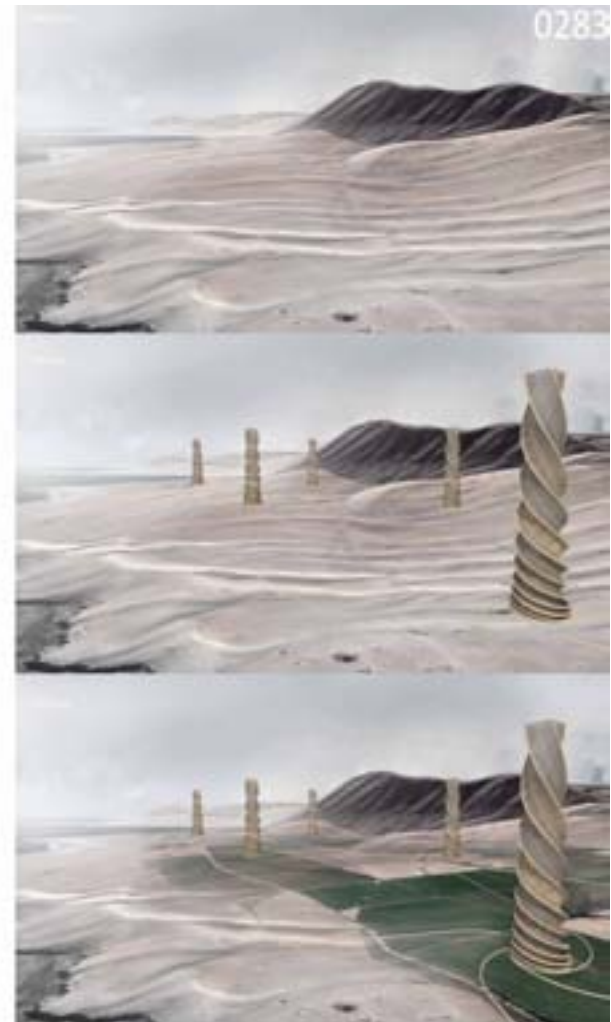
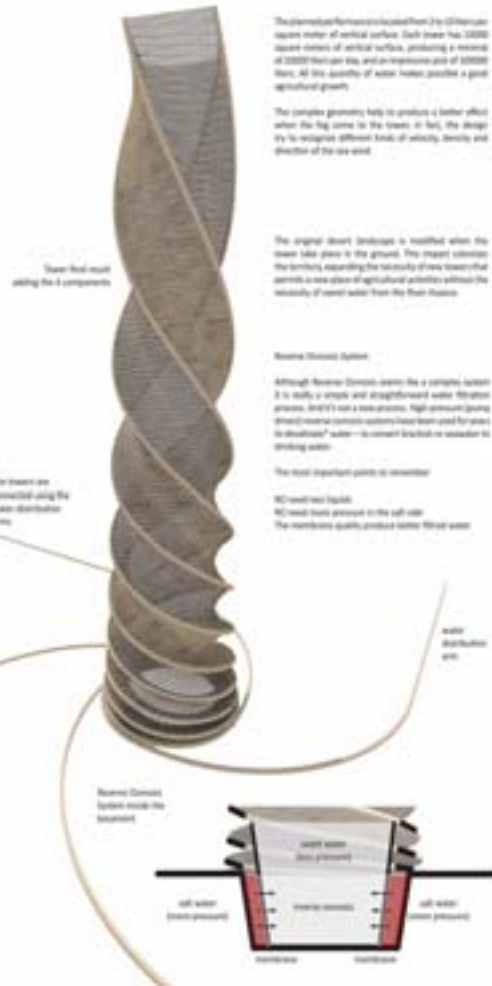
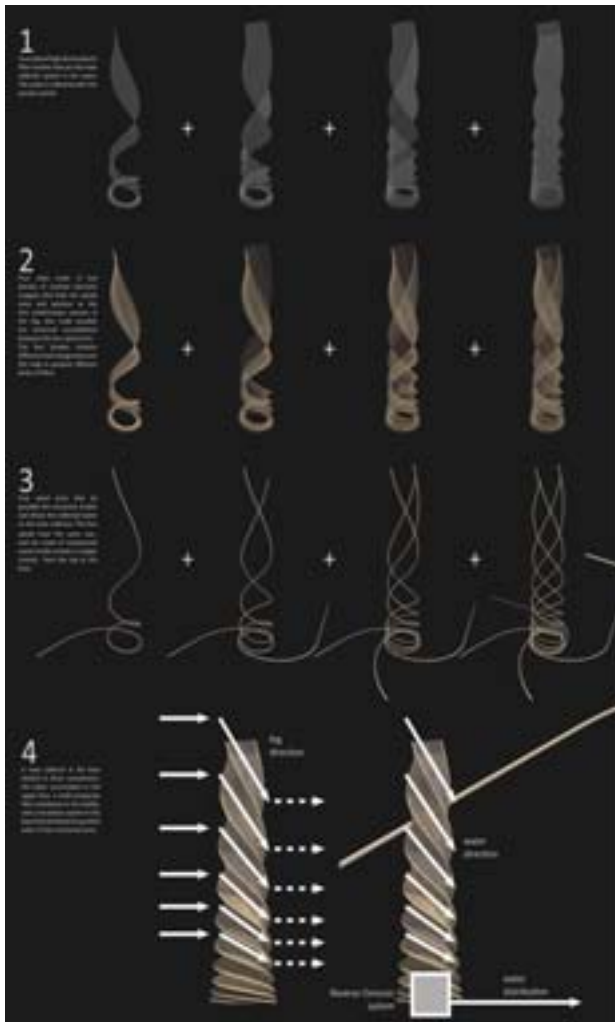
sustainable agriculture at edge of the Atacama Desert, one of the driest places on earth

- 400 m tall towers harvest airborne water from dense fog molecules
- stacked weave construction serves to trap and wick moisture into the tower
- spiraling structure provides a large surface area that funnels water into the basement
- trace minerals from the sea are filtered out via a reverse osmosis system

Coastal Fog Tower, Atacama



Coastal Fog Tower, Atacama



Erosion Control, Negev Desert, IL. Shlomo Aronson



Erosion Control, Negev Desert, IL. Shlomo Aronson



Flows + cycles

Flows may be invisible, but are real and material;
They include different aggregates and chemical states.

Engaging flows and cycles shifts concepts:
from local (administrative) borders to (dynamical) system boundaries.
zB. How big is e.g. Los Angeles if you consider it in terms of water supply?
How to inscribe urbanization into these flows –
how to inscribe these flows into urbanism?

Best practice: regional cultural landscape of Veneto - a mutual relationship:

Projects

Paulini Code, Venice, 1608.
Sustainable forestry in Veneto alpine landscape to
minimize sediment in rivers flowing into the lagoon

Watery Voids, Sao Paulo. MMBB, 2006.

Waterpleinen, Studio Vermeulen, Rotterdam

Erosion Control, Negev Desert, IL. Shlomo Aronson, 1977.
Managing flash floods to create new microclimate

Palisades Bay, NY

Downsview Park, Toronto. “xxx” J Corner + S Allen (20xx)

Agrarian Urbanism, Andres Duany (2010)

Paulini Code, 1608



Paulini Code, 1608



Paulini Code, 1608



Watery Voids, Sao Paulo, MMBB, 2006

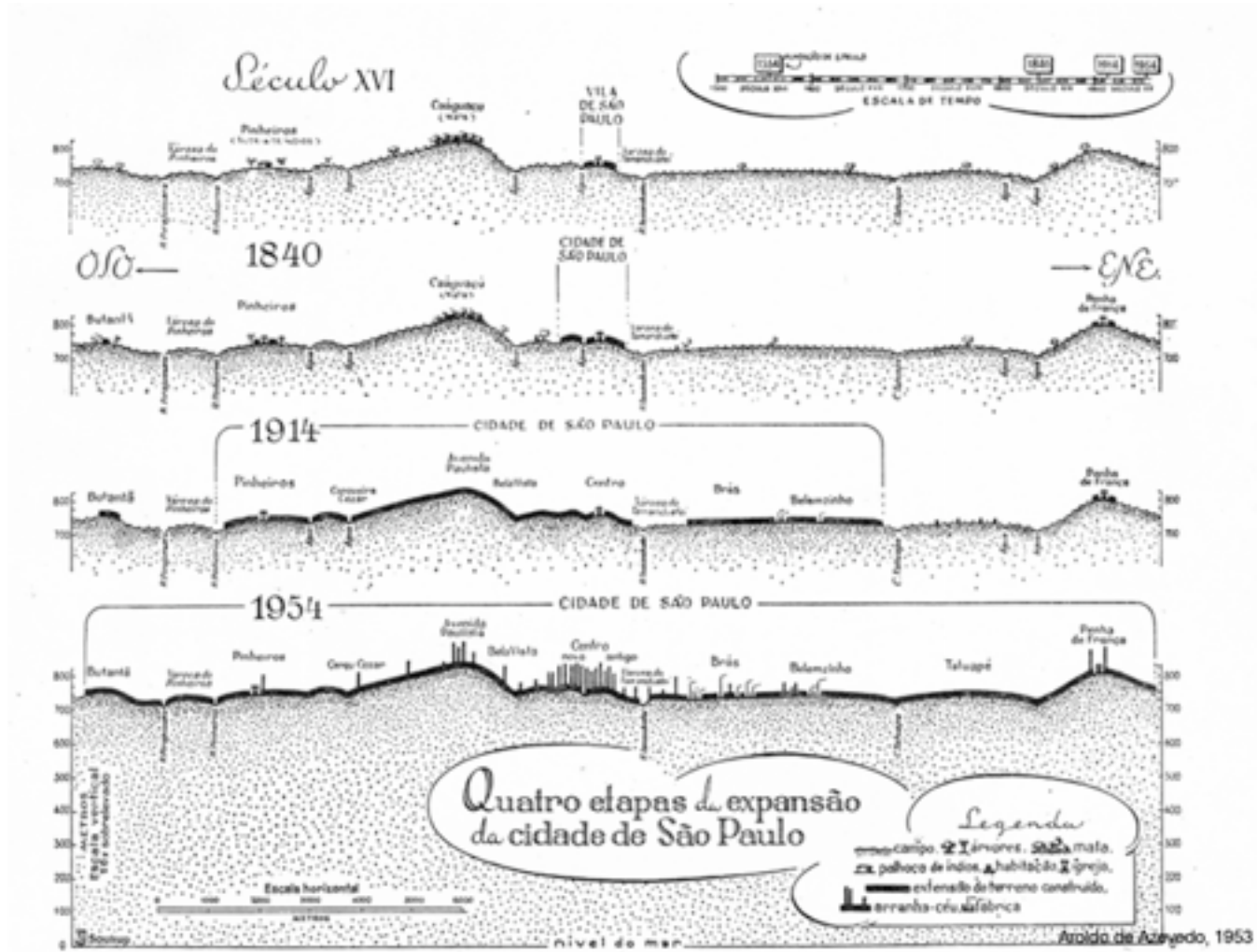
city grown over alluvial plain resulting in flooding

city building 131 *piscinoes* – flooding basins (43 completed)

MMBB – develop *piscinoes* not only technical infrastructure but as urban space integrated with context and given additional functions

project requires cooperation with other political and technical partners

Watery Voids, Sao Paulo, MMBB, 2006



Watery Voids, Sao Paulo, MMBB, 2007



Watery Voids, Sao Paulo, MMBB, 2007



Watery Voids, Sao Paulo, MMBB, 2007



Waterpleinen Rotterdam, Studio Vermeulen

Rotterdam Waterstad 2035

Rotterdam + water: changes from sea, river, sky and land

Using water threats as opportunity to address other agendas

1 new dikes make new inside/outside

2 Maas as living space

3 create spatial-structural water network

4 separate rainwater and sewage systems

Watersquare (pilot project) - Bloemhof

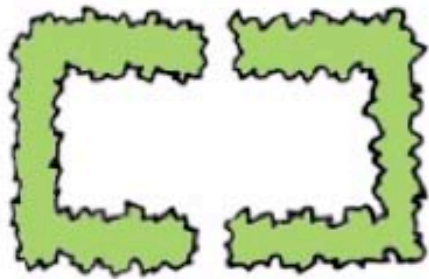
Oud Zuid district low lying with historic flooding problems

Bloemhof as central neighborhood square

making weather change visible, rainwater retention as visible and audible

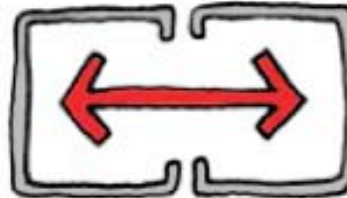
Waterpleinen Rotterdam, Studio Vermeulen

Bestaande bomen rij | Existing trees row



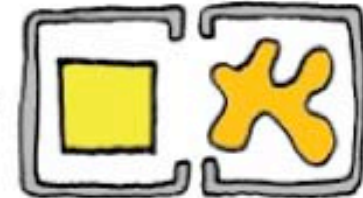
+

Twee sferen | Two spheres



+

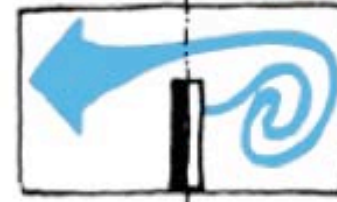
Een plein | One Square



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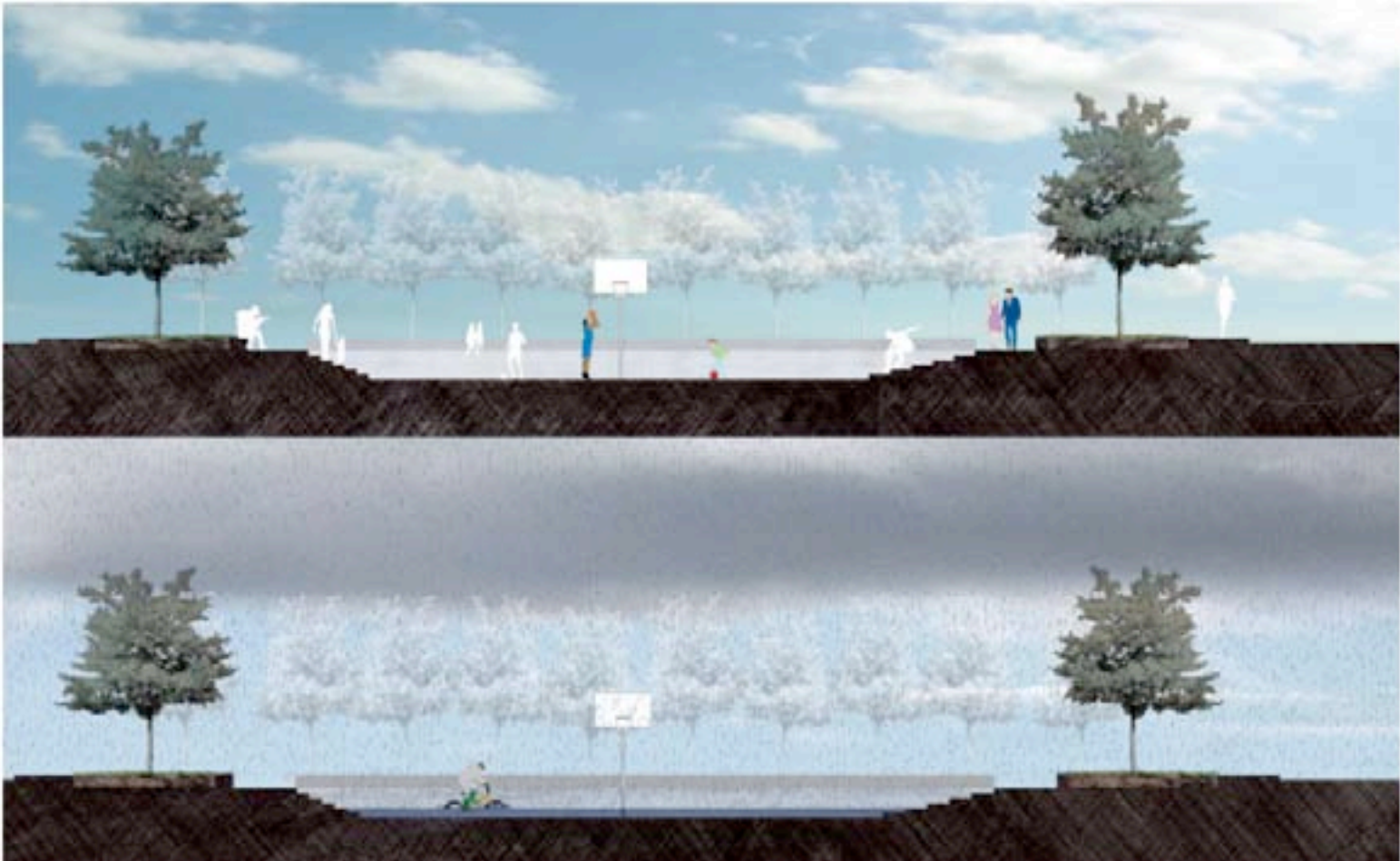
Contrastrijk | Contrasts

Correspondeert met waterhuishoudkundige werking |
Corresponds to hydraulic force

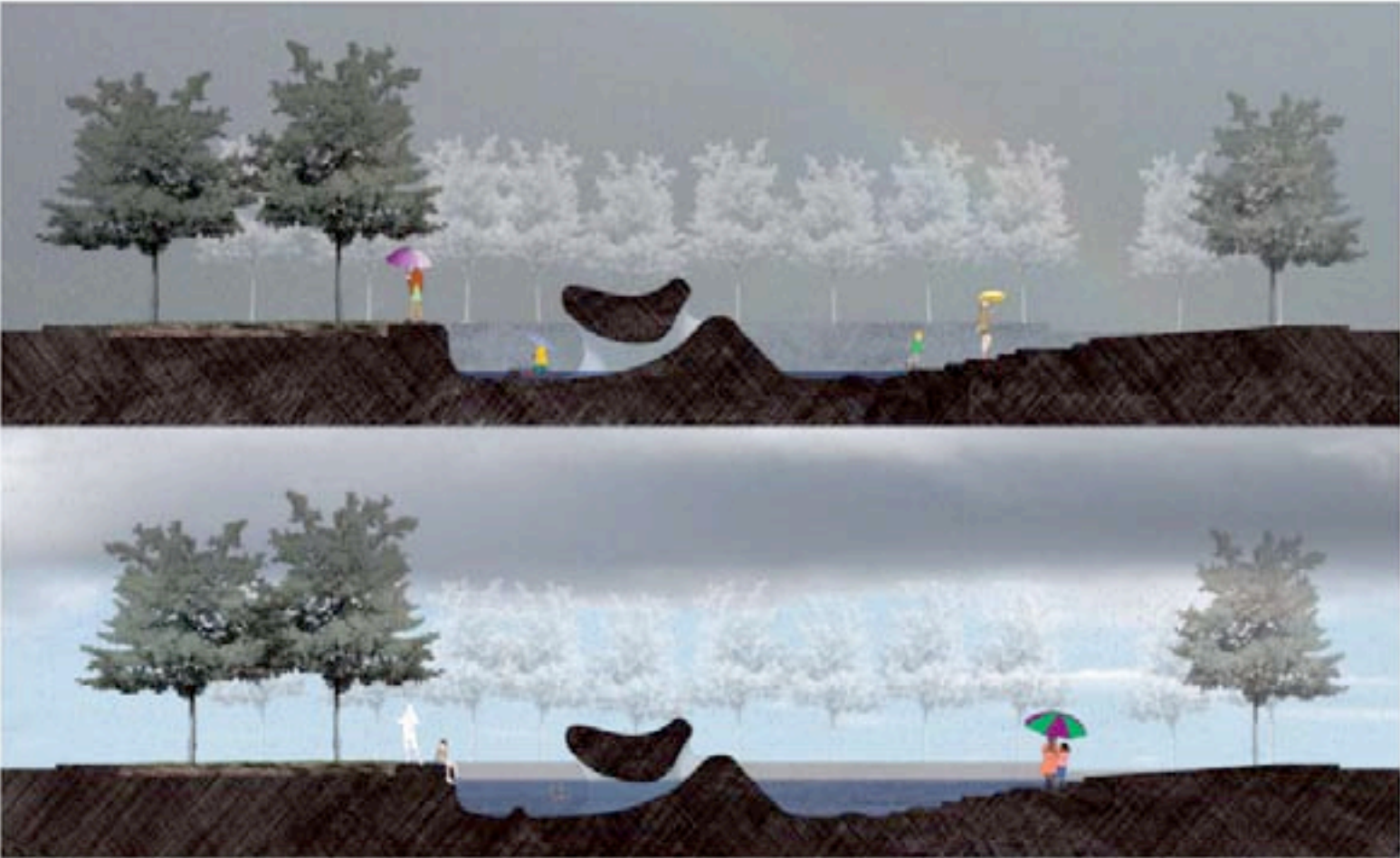
Waterpleinen Rotterdam, Studio Vermeulen



Waterpleinen Rotterdam, Studio Vermeulen



Waterpleinen Rotterdam, Studio Vermeulen



Waterpleinen Rotterdam, Studio Vermeulen



Palisade Bay, NY

Despite the hard lines of quays, sea walls and dikes, city and sea are one

Rising sea and stronger storms will break down this hard infrastructural barrier

To: build harder and stronger defenses, or use soft infrastructure to merge city and sea
Soft infrastructure synthesizes solutions for storm defense and environmental enrichment

0 “A new urban ground” (lower Manhattan). Yarinsky, Cassell, Drake

1 “Water proving ground” (Ellis and Liberty Islands u.a.). Lewis, Tsurumaki, Lewis

2 “Working waterline” (oil tank farm, Bayonne). Baird

3 “New aqueous city-man made islands” (Staten Island, Brooklyn). Bunge, Hoang

4 “Oyster-tecture – oyster reef nursery” (polluted canals and basins). Orff

Nordenson, G., Seavitt, C., Yarinsky, A. *On the Water / Palisade Bay*. New York: Hatje Cantz-MOMA, 2010. And, *Rising Currents: Projects for New York's Waterfront*. MOMA, New York, March 24-August 9, 2010.

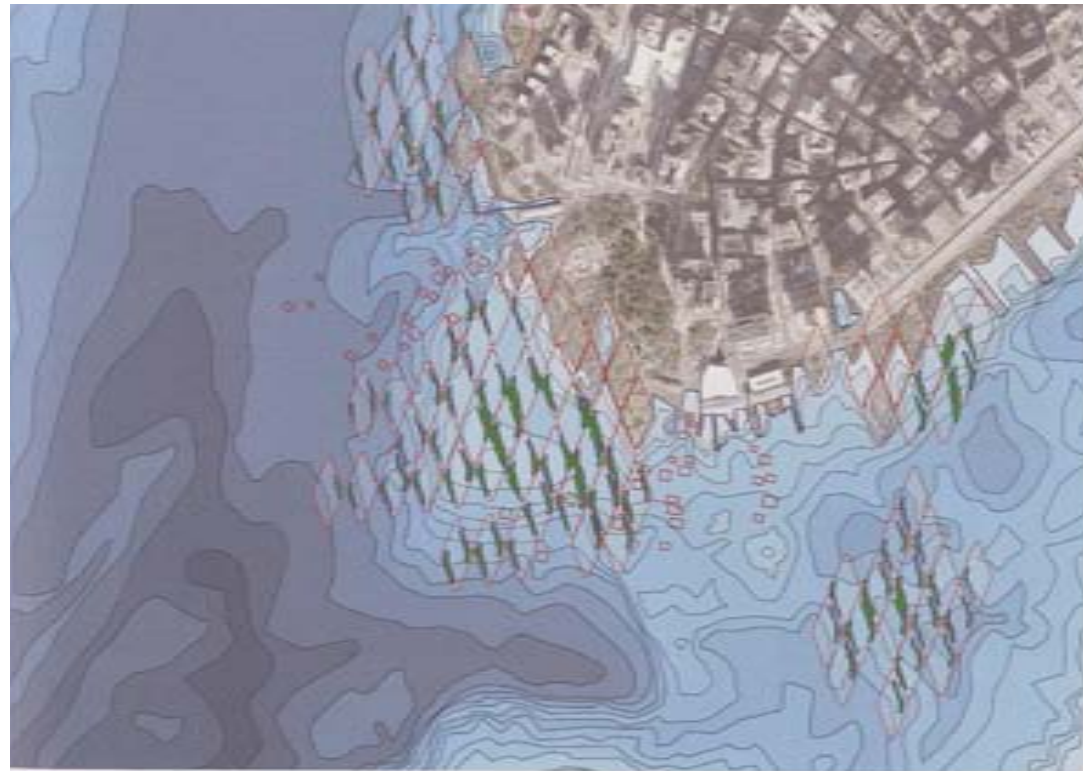
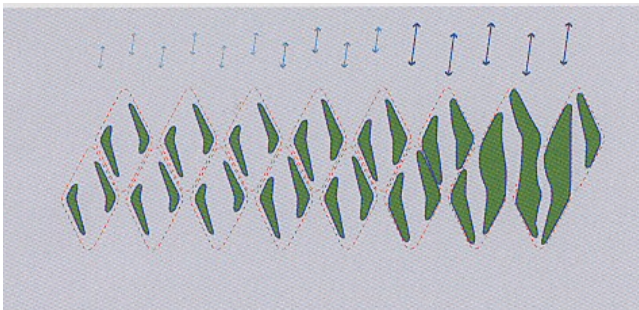
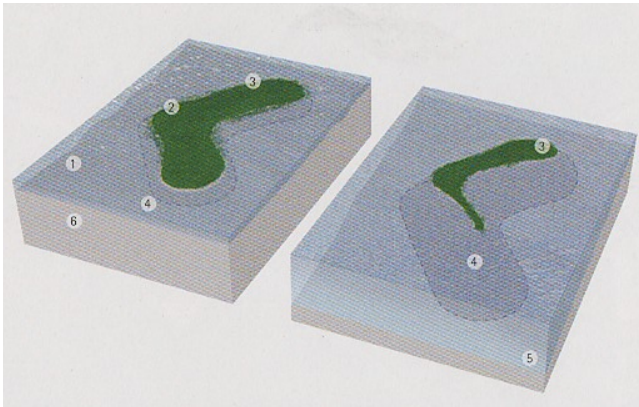
Palisade Bay, NY



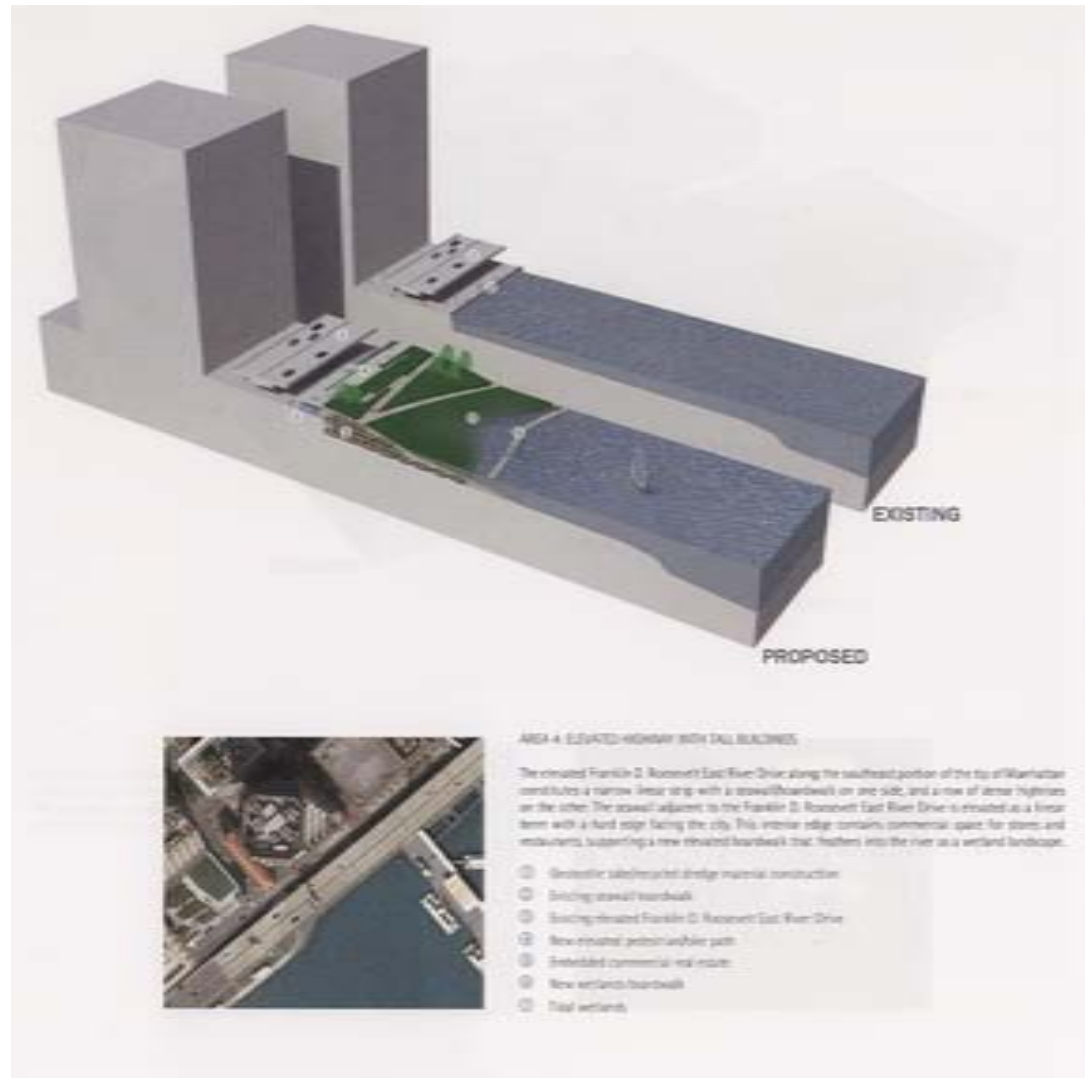
Palisade Bay, NY



Palisade Bay, NY



Palisade Bay, NY



Palisade Bay, NY

