



WATER SCARCE CITIES



WORLD BANK GROUP



WATER
PARTNERSHIP
PROGRAM

Towards urban water security under scarcity



Urban Water Security under Scarcity

A new pathway to urban water security

Unprecedented Challenges

Population growth, urbanization, economic and climate change are looming over urban water security in the region

Unsustainable Resource Management

Putting the region on a dangerous path towards major water crises in many countries

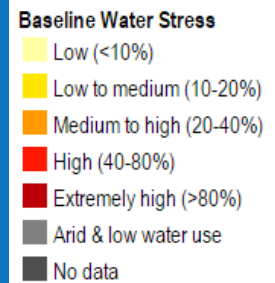
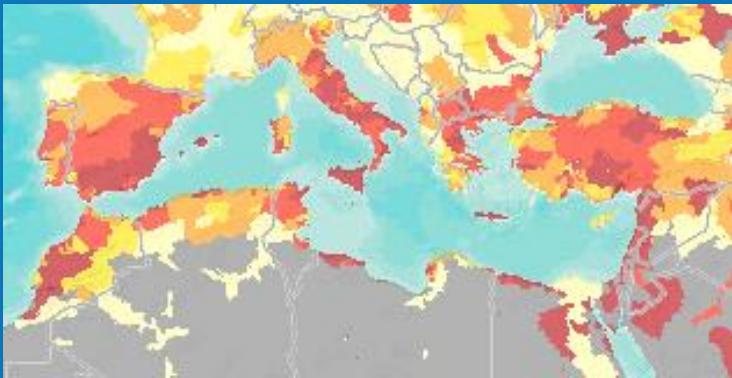
Unconcerned Utilities

Cities worldwide continue to rely on traditional solutions based on abundant resources and engineering approaches to increasing water supplies

Shifting the mindset towards resilience through diversification

The **mindset must shift** away from linear solutions, to embrace more integrated approaches. To support this, there is tremendous scope to **demystify** some of the existing, practical solutions to get there, and **unleash** the region's potential to tackle physical scarcity

Unprecedented challenges are looming over urban water security in the region...



...and the current management of water resources is putting the region on a dangerous path



Most of MENA population (> 60%) live in areas of high / very high water stress, – a situation shared by much of the Mediterranean region

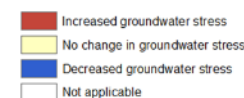
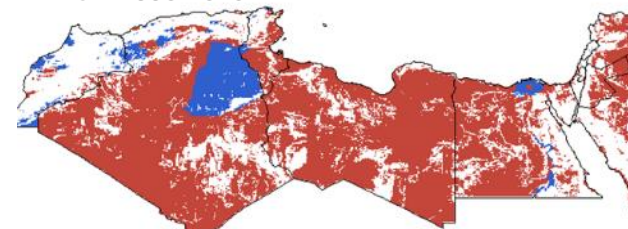


In MENA region, urban population to ↑ by 120% by 2050, while all climate models point to more severe and intense droughts in the future



In 2050, per capita municipal consumption could be constrained to 70-85% its current level, due to ↓ of water availability and competition with other users (mostly agriculture)

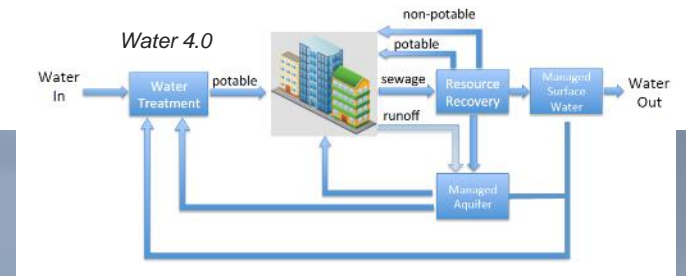
GW stress has increased almost everywhere from 1990-2010



Deltares

This redefines the challenge of delivering urban water services

Managing urban water service delivery is no longer sufficient, it becomes also about understanding and managing the urban water cycle in all its components, *and its links to the watershed (and aquifer)*



New questions become critical for service providers...

- ✓ Are the water resources we rely on managed in a sustainable manner?
- ✓ Which other users rely on these water resources?
- ✓ Will their (and our) water demand increase? What will that mean for our supplies?
- ✓ How will water resources be affected by climate change?
- ✓ Are there other, untapped water resources available?

... some of which have already embraced a new mindset

Closing the urban water cycle

Promoting recycling and recharge, and increase unlimited resources such as desalination

Resilience through diversification

It's not either/or anymore, it's both/and, where increased uncertainty and variability call for a better risk balance

Cooperating for increased allocations

Working with non-municipal users to promote wastewater reuse, or water banking/trading

Many solutions have already proved effective

Many cities have already pioneered effective solutions
to build resilience to water scarcity
and there is tremendous scope to demystify their
experience

Optimize Conventional Resources

Better storage management (surface and groundwater), inter-basin transfers

Increase Non-Conventional Resources

Seawater or brackish water desalination, wastewater recycling, stormwater harvesting

Improve Demand Management

Leakage reduction, Conservation

Successful experiences need to be scaled up...

- ✓ **Technologies are known**, and often less costly than alternative, especially when accounting for scarcity
- ✓ **Integration is critical**, to overcome the array of political, cultural, and other barriers
- ✓ **Public Outreach is key** to most successful experiences (e.g. Pure Water in San Diego)

... to bring the most successful solutions to the forefront

A difficult path to security

How do we unleash the region's potential?



Political/cultural issues

Limited sensitivity to water risks, entrenched engineering approaches, complexity of cooperation and demand management, cultural resistance to recycling, desalination



Institutional issues

Lack of accountability/autonomy of service providers, lack of mechanisms for integrated planning, rigid regulatory frameworks limiting innovations (recycling, trading, PPPs)



Technical/economic issues

Limited awareness of solutions, insufficient capacity for design/O&M, lack of robust economic assessment tools, limited financial resources

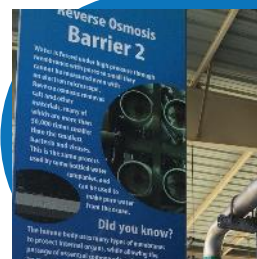


The Water Scarce Cities Initiative

Bolster awareness of effective approaches to build urban water security and climate resilience across the MENA region



Case Studies



Generate knowledge

Build on the review of water scarce cities experiences around the world to demystify options for urban water security under scarcity

The case studies will describe the nature of the local challenge from a water resources perspective, the technical solutions, costs and institutional mechanisms put in place. They will analyze the political economy around their adoption, identify the drivers of change and analyze how governance, capacity or technological challenges were addressed

Network



Facilitate exchanges

Multi-stakeholder dialogue, knowledge flow and collaboration through establishing a global network of practitioners and experts

This would include state/local government, water agency and utility managers with firsthand experience dealing with water scarcity or interest in exploring new approaches, and academic think-hubs that are fostering knowledge flows, in order to bring that experience to our countries, cities and utilities most in need.

Support



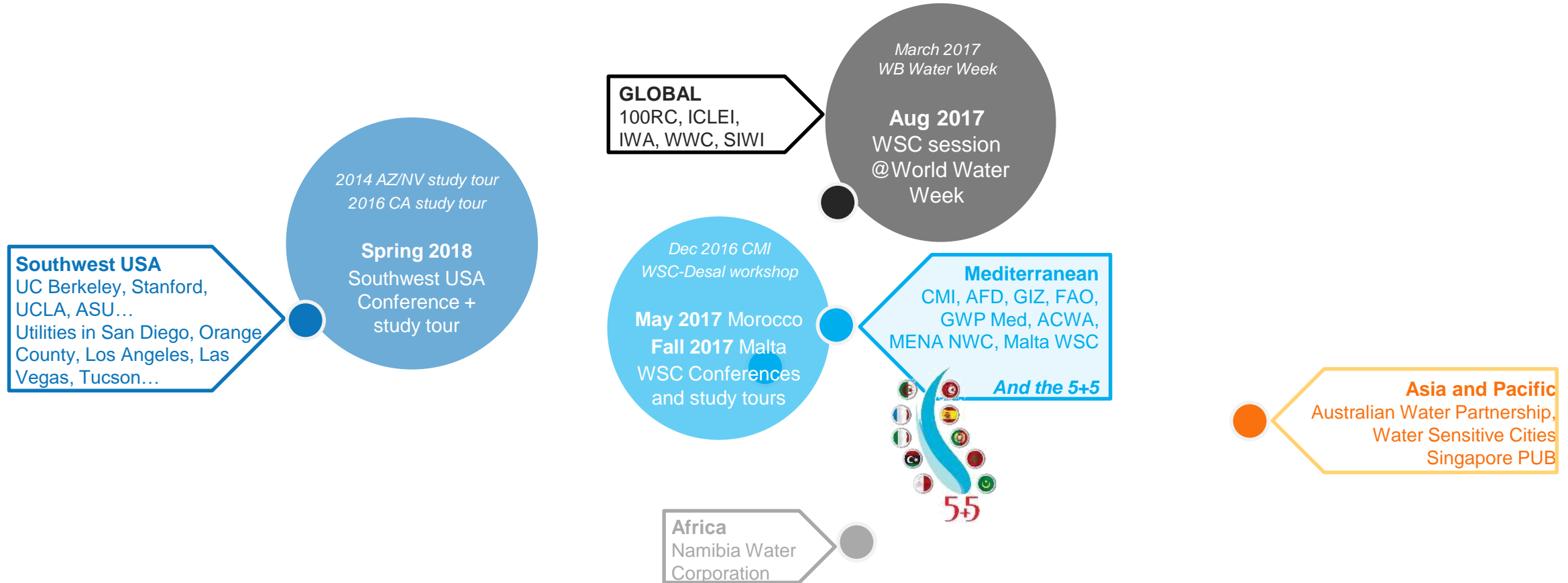
Engage our clients

Facilitate technical assistance to interested cities, to establish feasible pathways to water security

This support could include assessing current water resources management approaches, identifying opportunities based on knowledge generated through the initiative, or incentivizing the application of innovative approaches.

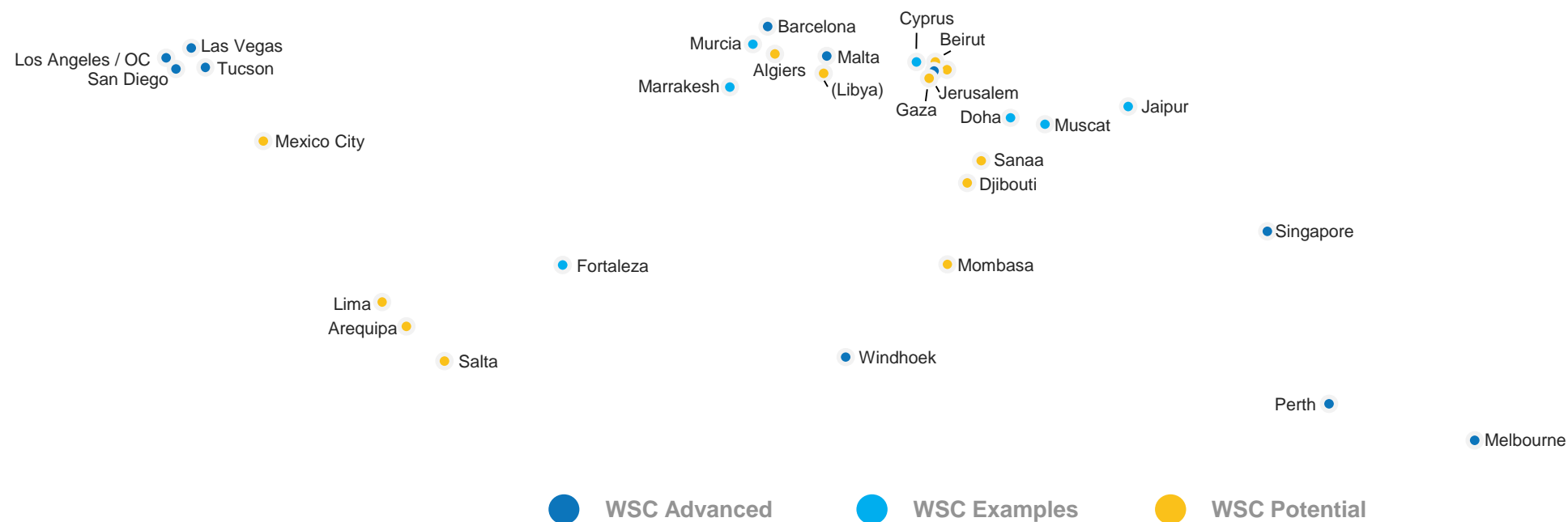
The Water Scarce Cities Initiative

Network – potential partnerships and upcoming events



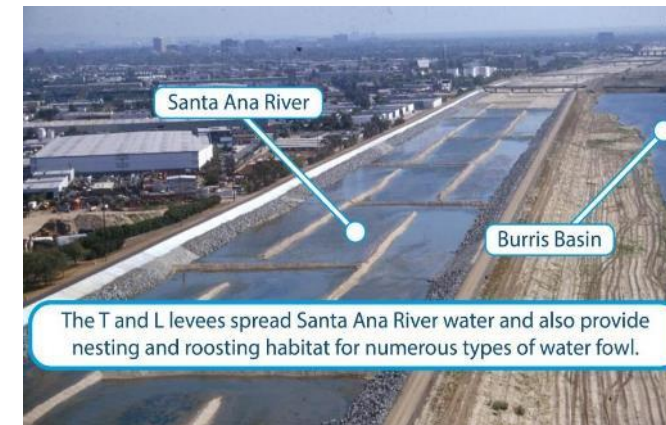
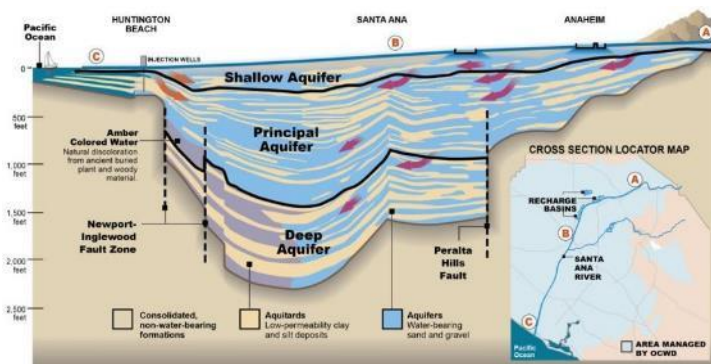
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Knowledge – on-going/potential case studies and target cities



Example from Southern California

Orange County Water District's decades of experience mobilizing non-conventional resources to secure local groundwater resources



Groundwater Governance

Orange County Water District (OCWD) developed wastewater recycling and stormwater capture to recharge the aquifer and reduce its dependence to imported water

Wastewater Recycling

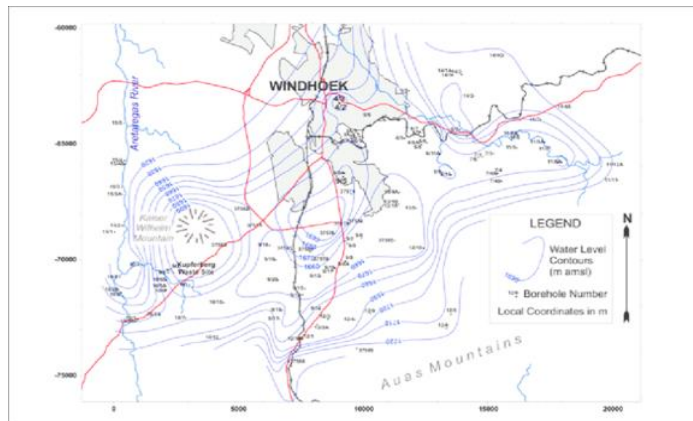
OCWD built a 400,000 CM/day water purification facility (GWRS), operational since 2008, producing near distilled quality to recharge the aquifer

Stormwater Capture

OCWD also built a dam on the only existing (seasonal) river in its jurisdiction, and manages the river bed into recharge basins, controlled by inflatable rubber dams

Example from Namibia

Windhoek's decades of experience
addressing extreme water scarcity



Groundwater Management

Windhoek artificially recharges its local aquifer, where surface water is “banked” during wet years as security against droughts.



Water Reclamation Wastewater reuse

The treatment of its wastewater effluents covers 17% of Windhoek's potable water demand. It is also used for urban irrigation and gardening needs (golf, parks, etc.)



Water conservation

With non-revenue water at 13% and well targeted regulation and tariff structure to address water wastage, Windhoek strives to make every drop count

Example from Malta

Malta's New Water strategy to diversify water resources and reduce pressure on aquifers



Seawater desalination

First introduced in Malta in the early 1880's through distillation plants, seawater desalination has long been a pillar of the country's water supply



Rainwater harvesting

Increase in rainwater harvesting infrastructure capacity at national scale, with a focus on the generation of additional benefits (ecosystems, tourism...)



Wastewater reuse

Three new polishing plants for re-use in irrigation, landscaping, industry and aquifer recharge



Water conservation

Reduction by 40% of water demand since 1994 through leakages reduction, awareness campaigns and economic incentives

Thank you for your attention

And if you're interested...



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Our Website

<http://www.worldbank.org/en/news/feature/2017/05/15/water-scarce-cities-initiative>



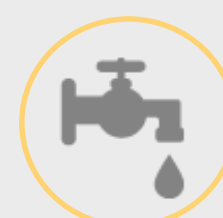
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