

Water Environment Federation: Responding to the Challenges to the Global Water Environment

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Background



Presentation Outline

- Water Environment Federation
 - Vision and Mission
 - Publications and Programs
 - Conferences
 - Challenges to the Global Water Environment
 - Water Infrastructure Sustainability
 - Contaminants of Emerging Concern
 - Global Climate Change
 - Workforce Demographics
 - Water Security Issues
 - Concluding Remarks
-

Water Environment Federation

The Water Environment Federation (WEF): Founded in 1928 as a not-for-profit technical and educational organization with members from varied disciplines within the water quality fields.

The WEF network includes water quality professionals from 76 member associations in 30 countries. On the web: <http://www.wef.org/>

Water Environment Federation: Vision and Mission

Vision:

- WEF will be *recognized as a leader dedicated to the **preservation and enhancement of the global water environment.***

Water Environment Federation: Vision and Mission

□ **Mission:**

- **Promote scientifically sound environmental practices and regulation.**
- **Educate members, the public and policy makers.**
- **Promote and advance the water quality profession.**
- **Promote public health by preserving and enhancing the global water environment.**
- **Develop and promote practices and policies, which assist our members to serve the public interest in providing efficient and environmentally protective water quality and wastewater management services.**
- **Deliver high quality products and services to members and stakeholders.**

WEF Members are Diverse

- Municipal utilities
- Private sector/consulting engineers
- Other: industry, academics, students, state and federal government employees
- Members in over 30 countries

WEF Technical Publications

- **Magazines and Journals**
 - Water Environment and Technology
 - *Water Environment Research*
 - *Water Practice* (on-line)
 - World Water
- **Technical Bulletins and Newsletters**
 - Water Environment Laboratory Solutions
 - Biosolids Technical Bulletin
 - Industrial Wastewater Technical Bulletin
 - Watershed & Wet Weather Technical Bulletin
 - Utility Executive
 - Water Environment Regulation Watch

WEF Technical Publications

- **Manuals of Practice**
 - Biological Nutrient Removal
 - Operation in Wastewater Treatment Plants
 - Clarifier Design
 - Upgrading & Retrofitting Water & Wastewater Treatment Plants
 - Financing & Charges for Wastewater Systems
- **Operations Manuals**
 - Operation of Municipal Wastewater Treatment Plants
- **Standard Methods**
- **Other**
 - Membrane Systems for Wastewater Treatment
 - Trenchless Technology Pipeline and Utility Design, Construction, and Renewal
 - Water-Quality Trading: A Guide for the Wastewater Community
 - Etc..

WEFTEC

WEFTEC: The Leading Water Quality Event in the World

- San Diego, CA, (Typically 17,000-18,500 attendees)
- Nearly 1000 businesses covering 2.5 hectares of actual exhibit space
- Technical Program:
 - 100 Technical Sessions;
 - 30 Pre-conference Workshops;
 - 500 Podium Presentations,
 - 100+ Posters,
 - Facility Tours



WEF Specialty Conferences

- Specialty Conferences include
 - Disinfection: Current Practice and Future Trends
 - Utility Management, in collaboration with AWWA
 - Nutrient Removal
 - Residuals and Biosolids Management
 - Collection Systems
 - Water Reuse Symposium (with AWWA & WRA)
 - Compounds of Emerging Concern
 - Membrane Technology
 - Total Maximum Daily Load (TMDL)

WEF Public Education and Outreach

- Water is Life...Infrastructure Makes It Happen
- World Water Monitoring Day
- Stockholm Junior Water Prize
- Educational Materials for Public and Educators
 - Fact sheets
 - School Curricula

WEF Policy Focus

Communications Tools:

- Consensus Policy and Position Statements
- Legislative and Regulatory Advocacy
- Government Affairs Program
- National Clean Water Policy Forum
- Working with Member Associations to address national and international issues.

Challenges to the Global Water Environment

- **Water Infrastructure sustainability**
- **Contaminants of Emerging Concern**
- **Global Climate Change**
- **Workforce Demographics**
- **Water Security Issues**

Water Infrastructure sustainability

- **Infrastructure sustainability Issues:**
 - Deteriorating infrastructure
 - Insufficient infrastructure facilities
 - Lack of sustainable renewal, replacement, and maint. programs
 - Absence of sustainability educational programs



Realities of Water Infrastructure Systems

- Water Infrastructure sustainability is a global problem:
 - For example, U.S. EPA estimates that the US will need \$450 billion over the next 20 years
 - Similar issues in developed and developing countries
 - Biggest Challenge: in 2007 there are:
 - 2 billion people with no access to safe water supply
 - 4 billion people with no access to reasonable sanitation

Sustainable Infrastructure Systems

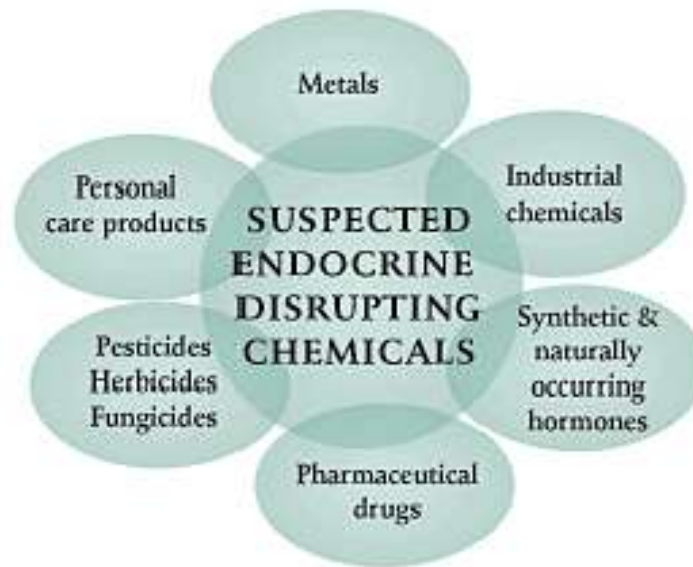
- WEF Position - a three-pronged approach to solve the infrastructure challenge:
 1. Effective water systems management and funding to ensure long-term sustainability of collection, treatment and distribution systems;
 2. Significant and continuing investment commitment; and
 3. Public and business support to insure that water systems continue to effectively serve their communities. – Full Cost Recovery

Compounds of Emerging Concern

- Compounds of Emerging Concern
 - Endocrine Disrupting Compounds (EDC)
 - Pharmaceuticals
 - Personal Care Products

Endocrine Disrupting Compounds (EDC)

Endocrine system -- a complex network of glands and hormones that regulates various life functions such as growth, reproduction and the way various body organs work in people, wildlife and aquatic organisms.



Workforce Demographics Issues

□ Workforce Demographics Issues

- “Graying” of the professional work force in all sectors of the water industry
- Insufficient replacement of work force with qualified professionals
- Problem more acute in wastewater sector of industry

Workforce Demographics Issues

The need to grow the human resource element of our industry:

- Programs to attract **young professionals** into the field
- **Public education** programs that highlight the need and impacts of water and wastewater systems on our civilization
- Programs to provide **schools** with the needed resources to educate children of all ages on the value of water and environmental management.
- Improving the **salaries and wages** of water professionals -- sufficiently attractive to match the value of water and environmental management to our civilization.

Global Climate Change

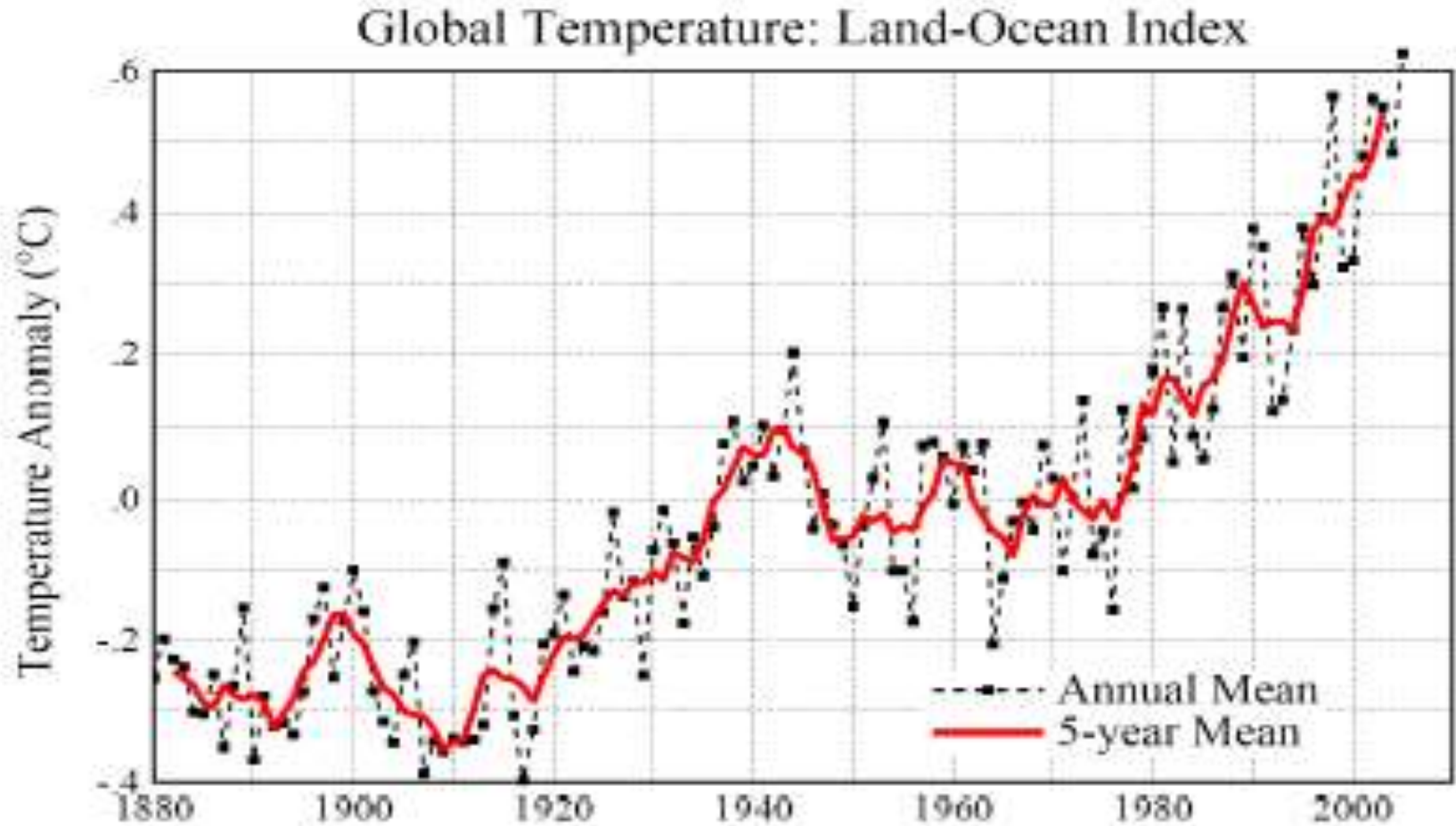
- **Climate change is quickly becoming one of the most pressing priorities for the water systems and water professionals**

- **Industry must be committed to:**
 - Help **understand the phenomenon** of climate change and its impacts on water systems.
 - Become **better prepared** to deal with the impacts of this phenomenon on the sustainability of water supplies and water systems.
 - **Adaptive Management** to implement timely solutions to the challenges posed by the changing global climate and environment.

Is Climate Change Here?

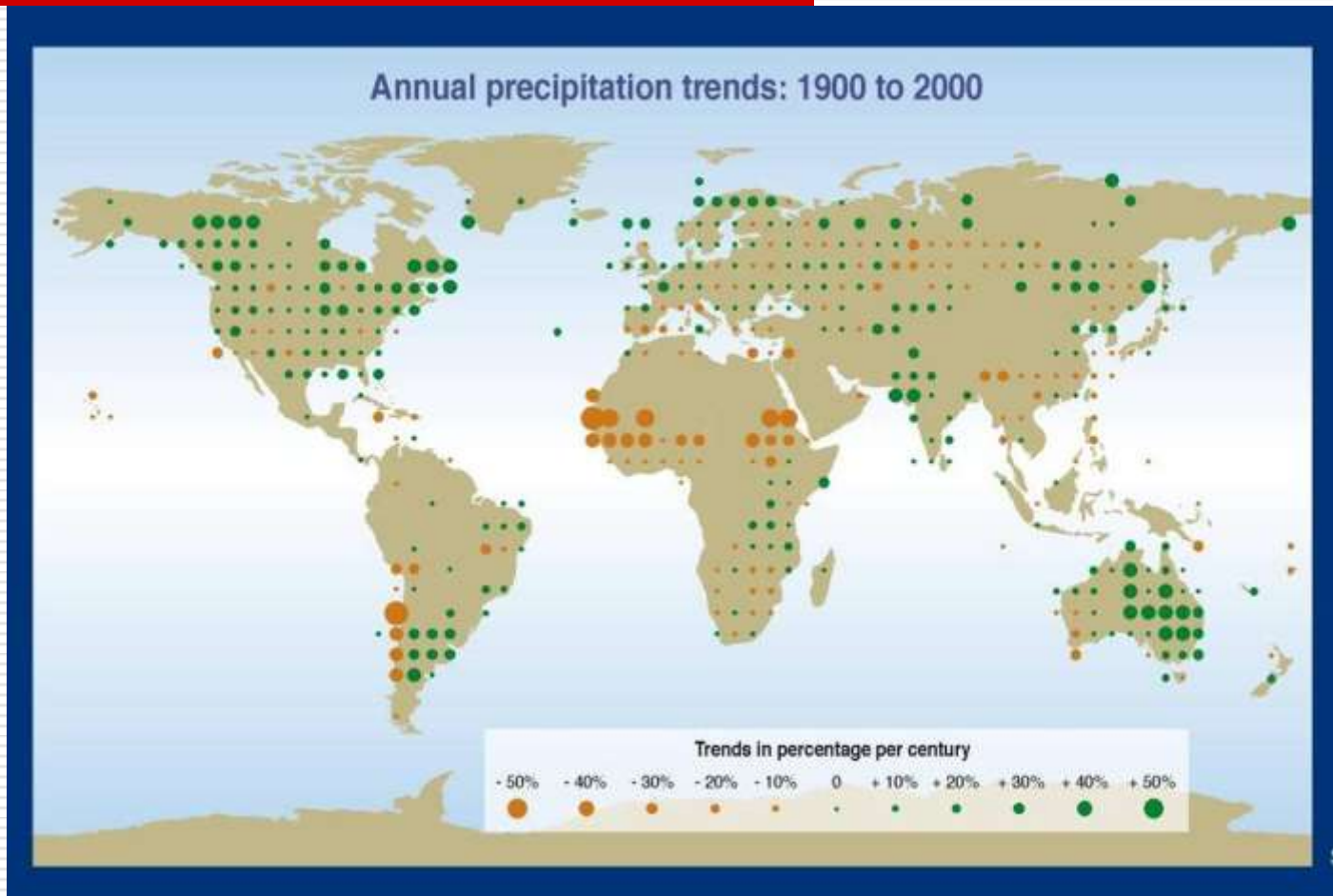
- UN Framework Convention on Climate Change – (based on data from UNEP, WMO, NASA) indicates:
 - Precipitous global temperature increase
 - An average 25 per cent decrease in rainfall has occurred in many area, especially the Sahel (Africa) during the past 30 years.
 - By 2025 approximately 480 million people in Africa (alone) could be living in water scarce or water stressed areas.
 - Middle East and North Africa (MENA) will be one of the most drastically affected areas in the world
 - Sea levels could rise by 15 to 95 cm by 2100, according to some estimates.

Evidence of Past Climate Change



Source: U.S. NASA

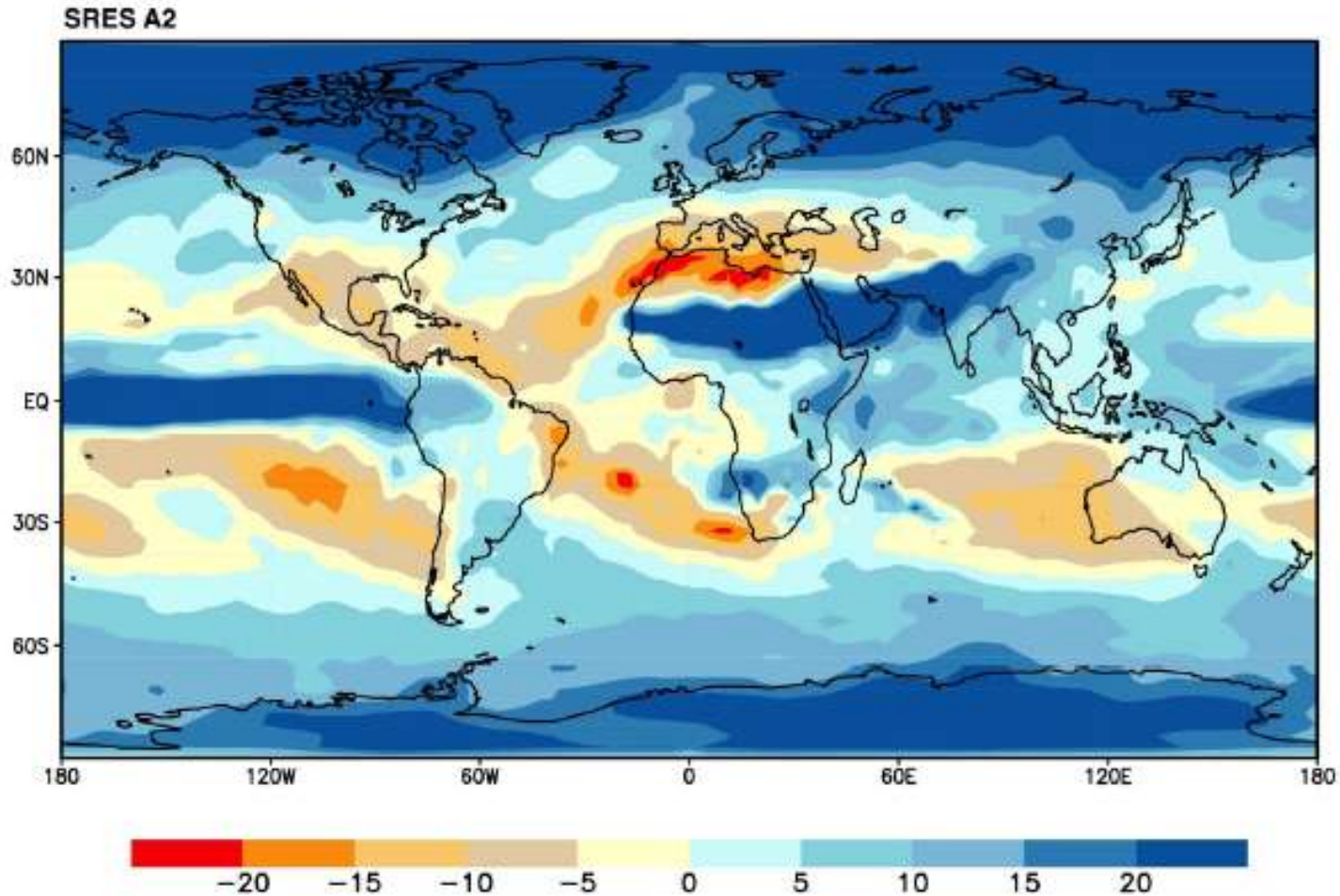
World-wide Precipitation Trends 1900-2000



Source: WMA-UNEP

GLOBAL CLIMATE CHANGE

Changes in total precipitation



Source: NASA & World Bank

Global Renewable Water Resources

(by region)

Actual Renewable Freshwater Resources per Capita by Region

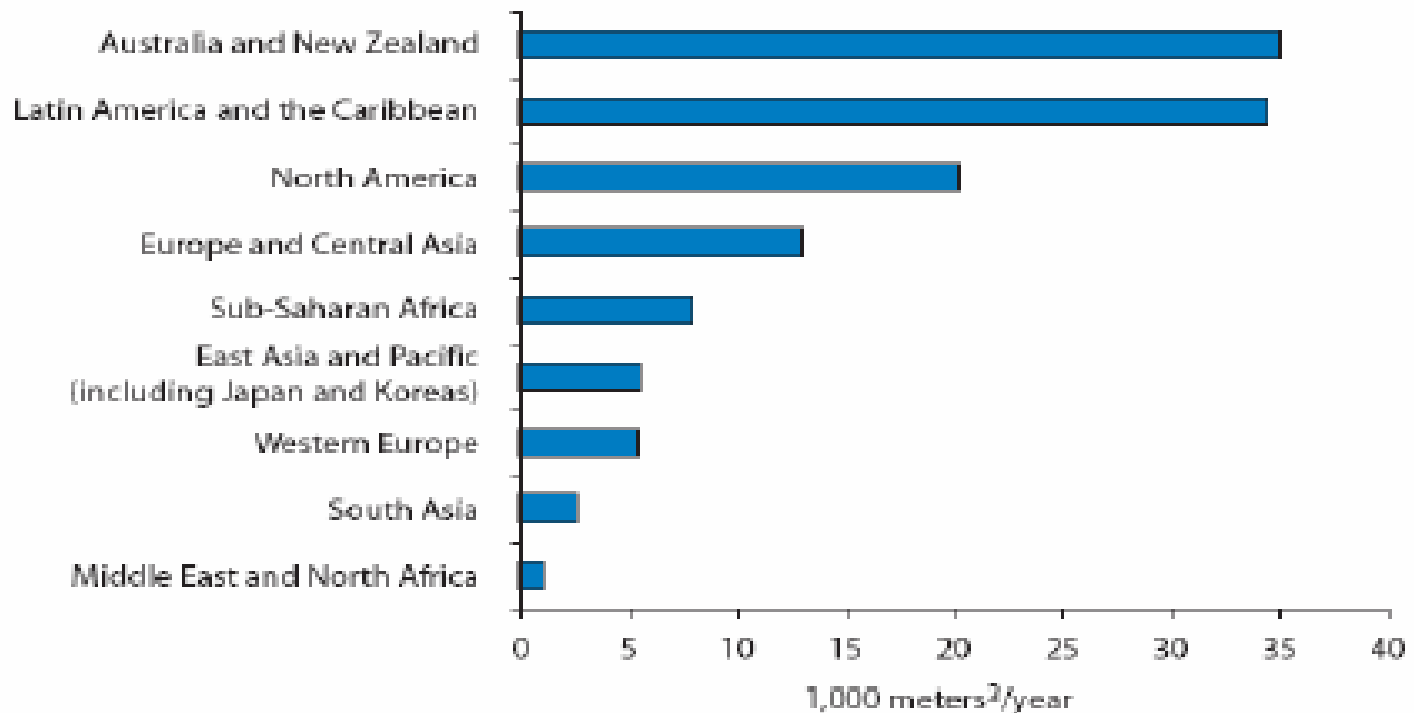
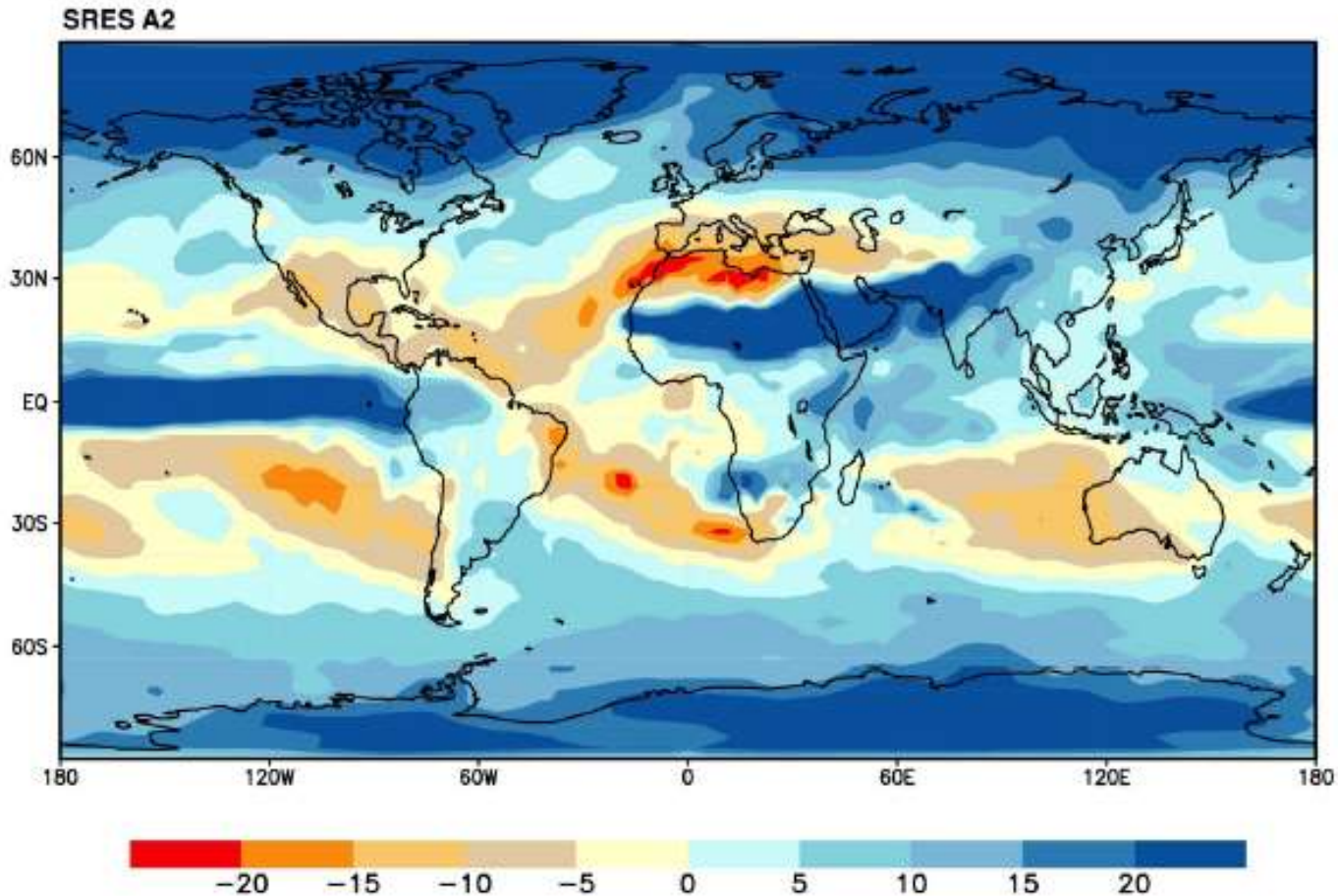


FIGURE 10.10 AQUACTAT

Source: World Bank

GLOBAL CLIMATE CHANGE

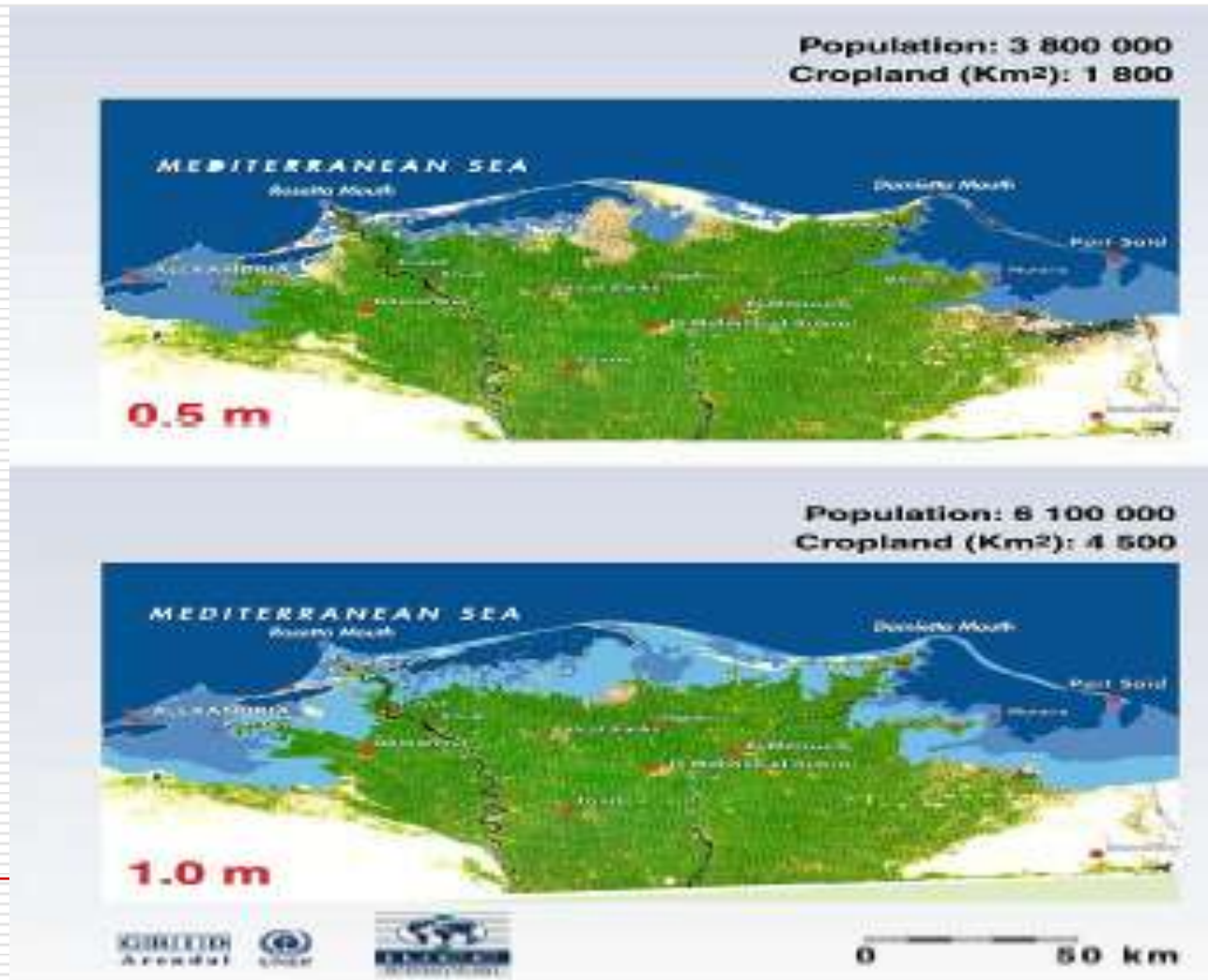
Changes in total precipitation



Source: NASA & World Bank

GLOBAL CLIMATE CHANGE

Potential Impacts on the Nile Delta



Source: World Bank

Global Climate Change Predictions

- ❑ **Most socio-economic, environmental, and human health sectors will be adversely impacted.**
- ❑ **Agricultural productivity is projected to decrease and crop yields are projected to decline.**
- ❑ **Melting glaciers will increase flood risk and result in long-term reduction in water supplies.**
- ❑ **Rising sea levels will increase coastal flooding.**
- ❑ **Water availability for services, energy, and environmental uses is projected to decrease.**
- ❑ **Warming will exacerbate loss of biodiversity, increase water pollution and degradation of watersheds.**

Challenges of Global Climate Change

Challenges of global climate change include:

- Dealing with uncertainty and unpredictability – Can we afford to ignore the possibility?
- Devising sustainable solutions to deal with climate change:
 - Prevention measures including reducing carbon emissions (CO₂ and CH₄).
 - Innovative responsive measures including serious conservation, water reuse, desalination, and finding new water supplies.
 - Public education

The Challenges of Water Reuse

Water reuse agenda

- Planned water reuse is a complex and requires a different mindset.
- Regulatory, planning, management constraints outweigh technical ones.
- Prerequisites: Good wastewater management capacity, and well-targeted economic applications of reclaimed water.
 - Agriculture
 - Industrial and power production
 - Recreational uses
- Reuse schemes such as the “NewWater” model need to be seriously considered.

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Thank You for Listening

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