The Coca-Cola Company's Water Programs and Research Needs

Brian McCord

Water Resource Manager

The Coca-Cola Company

Dept of Environment & Water Resources

Freshwater – A looming crisis

Headlines to the Bottom Line

WSJ.com THE WALL STREET JOURNAL. ONLINE

Business' Thirst for Water Is Unsated

August 23, 2004

NEW STRAITS TIMES
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June 6, 2004

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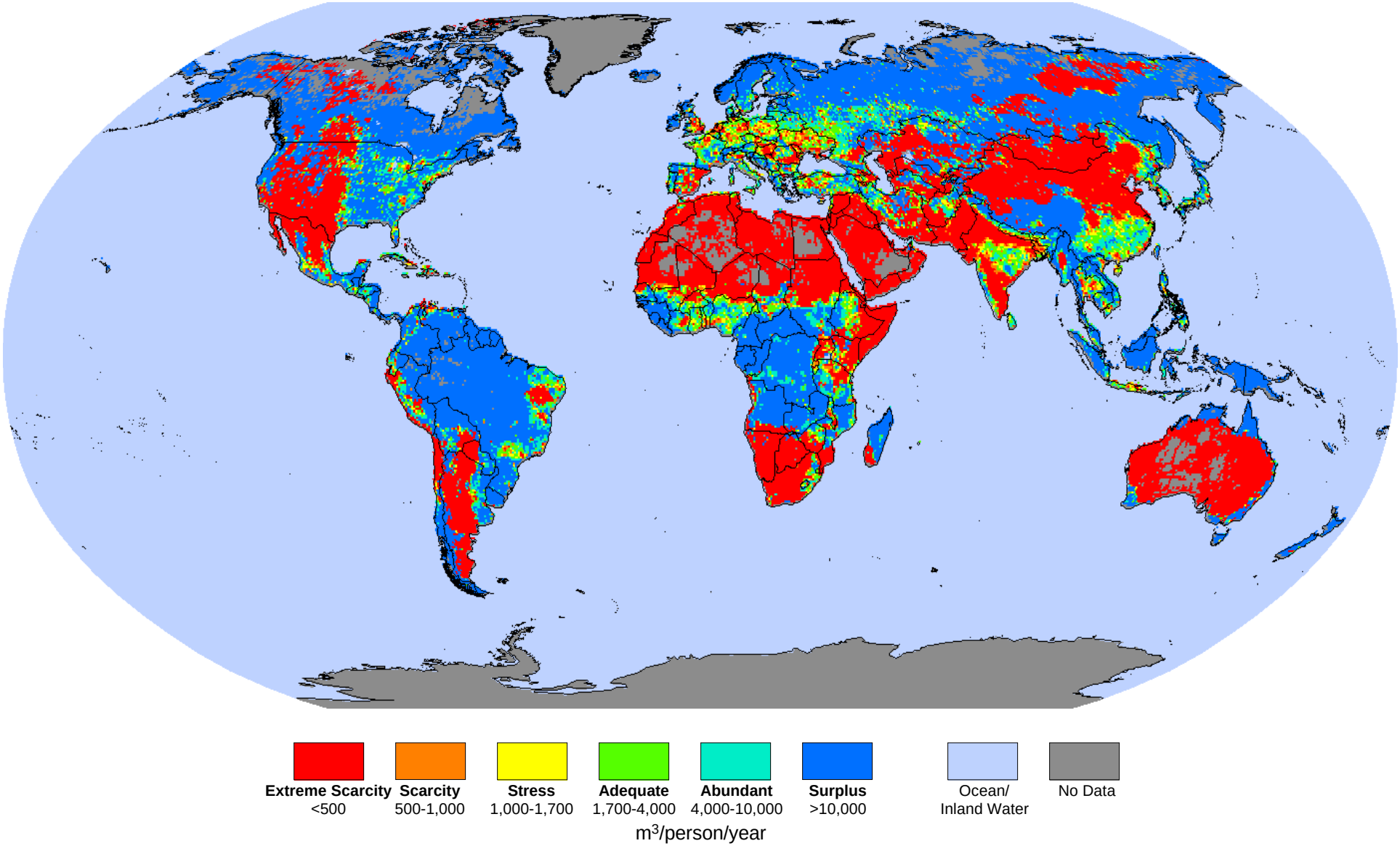
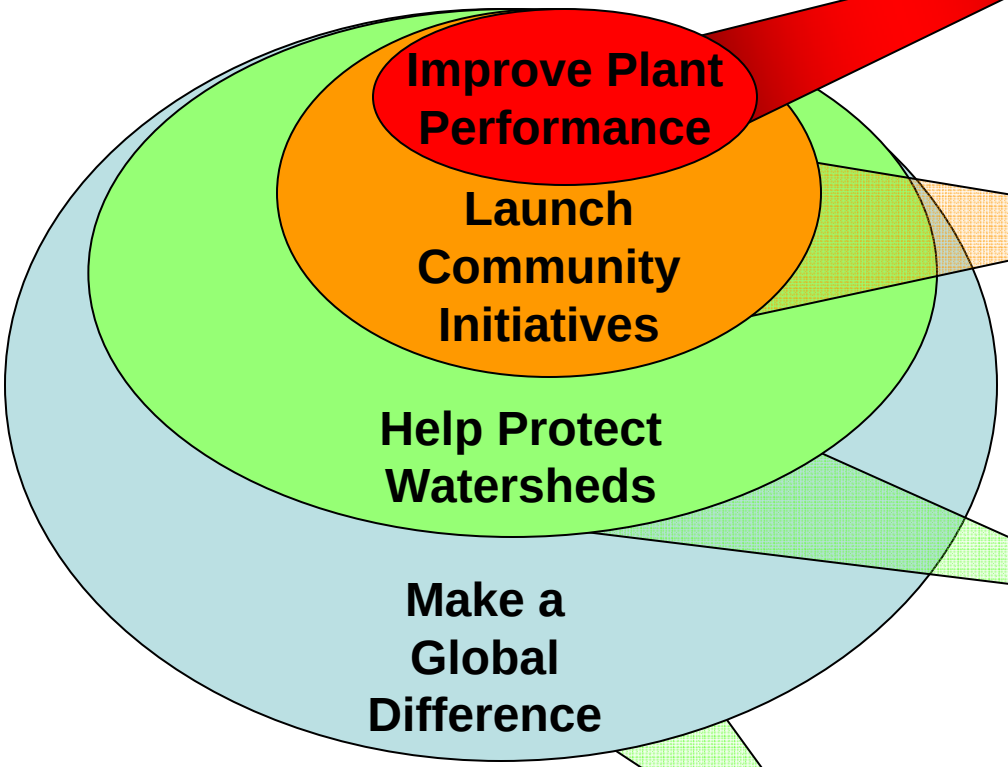


The Action Imperative

- Water is fundamental to our business.
- We have significant and increasing risks today.
  - SEC disclosure: “...Water is the main ingredient in every product… and is also a limited resource facing unprecedented challenges from over-exploitation, increasing pollution and poor management.”
- We do not have the option of inaction.
  - Fiduciary obligation to address water risks
  - “Pay Now or Pay More Later”
- We can lead … getting it right will pay real dividends.
  - Freedom to grow, cost avoidance, reputation
  - More control over our own future and options

Water Stewardship Destination



- ***Goal #1: Be one of the most efficient industrial water user in our peer class.***
- ***Goal #2: Help enable access to clean drinking water in all our communities.***
- ***Goal #3: Support the protection of watersheds in regions where we operate.***
- ***Goal #4: Mobilize the International Community.***

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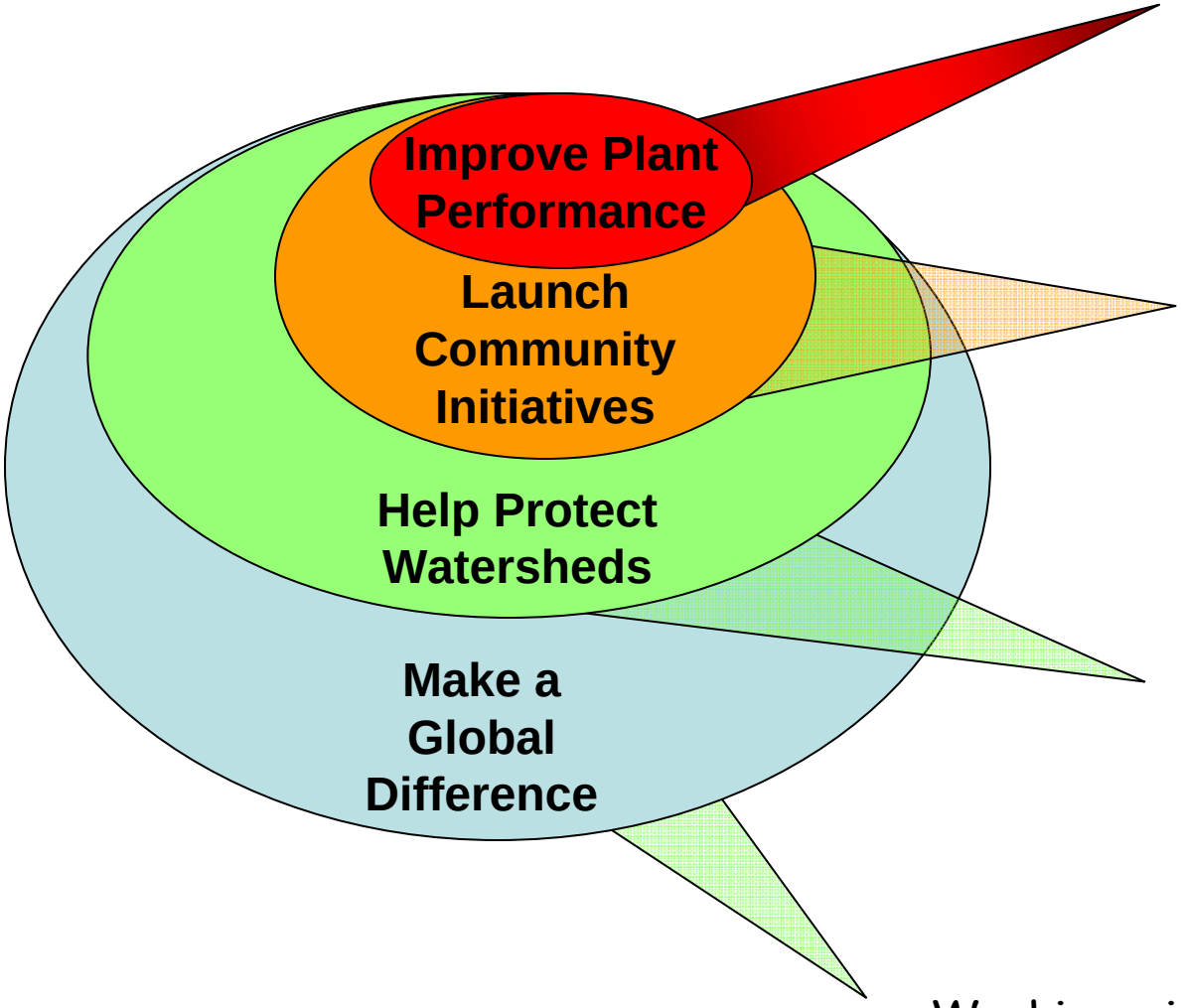


Water and Wastewater Minimization Program

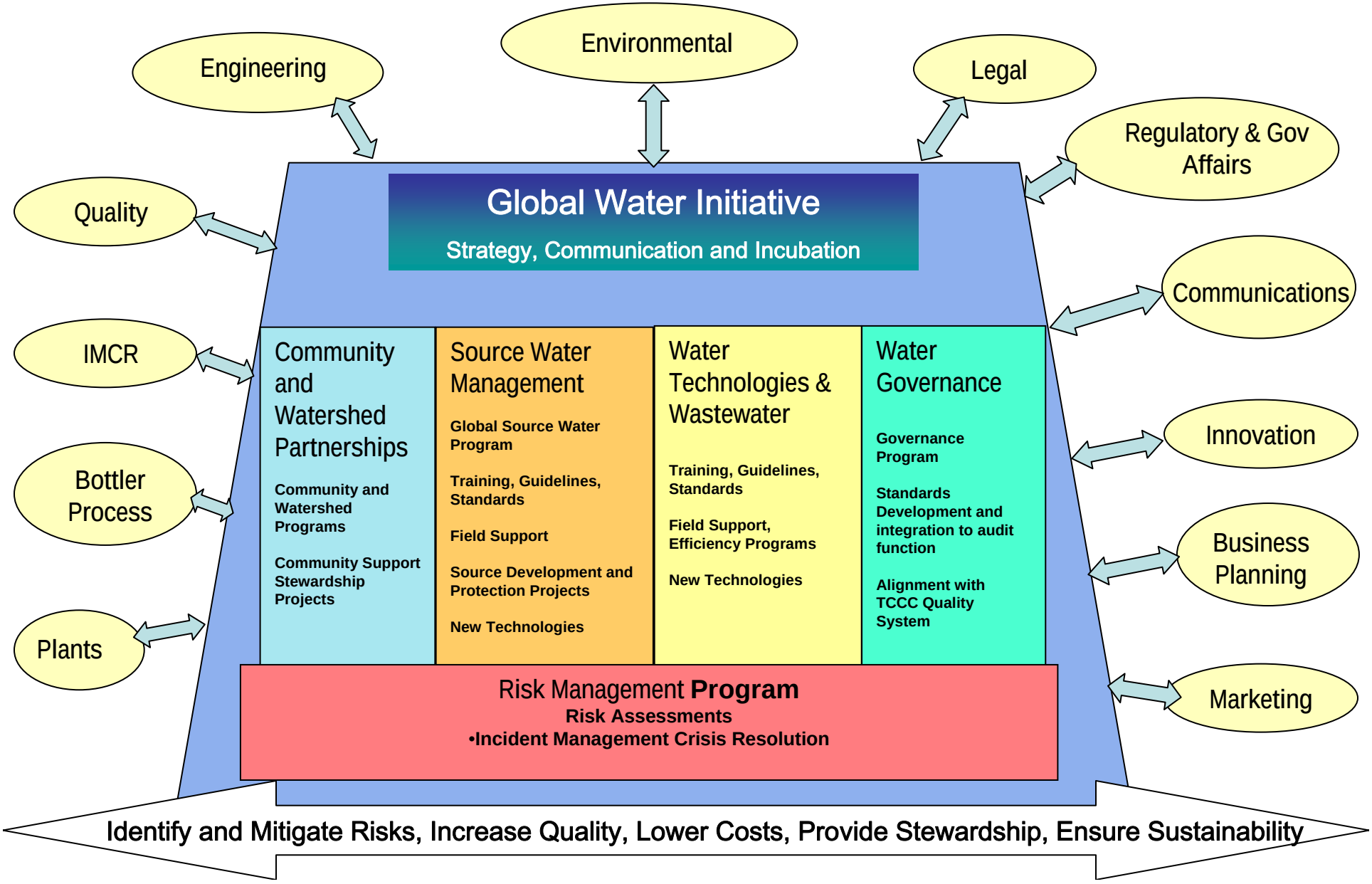
Community Partnership Programs Focused on Water Access and Watersheds

Watershed Partnerships, Hydrogeology and Hydrology Research

Working with NGO's and Media

Water Resource Management and Stewardship

Global Center for Water Excellence



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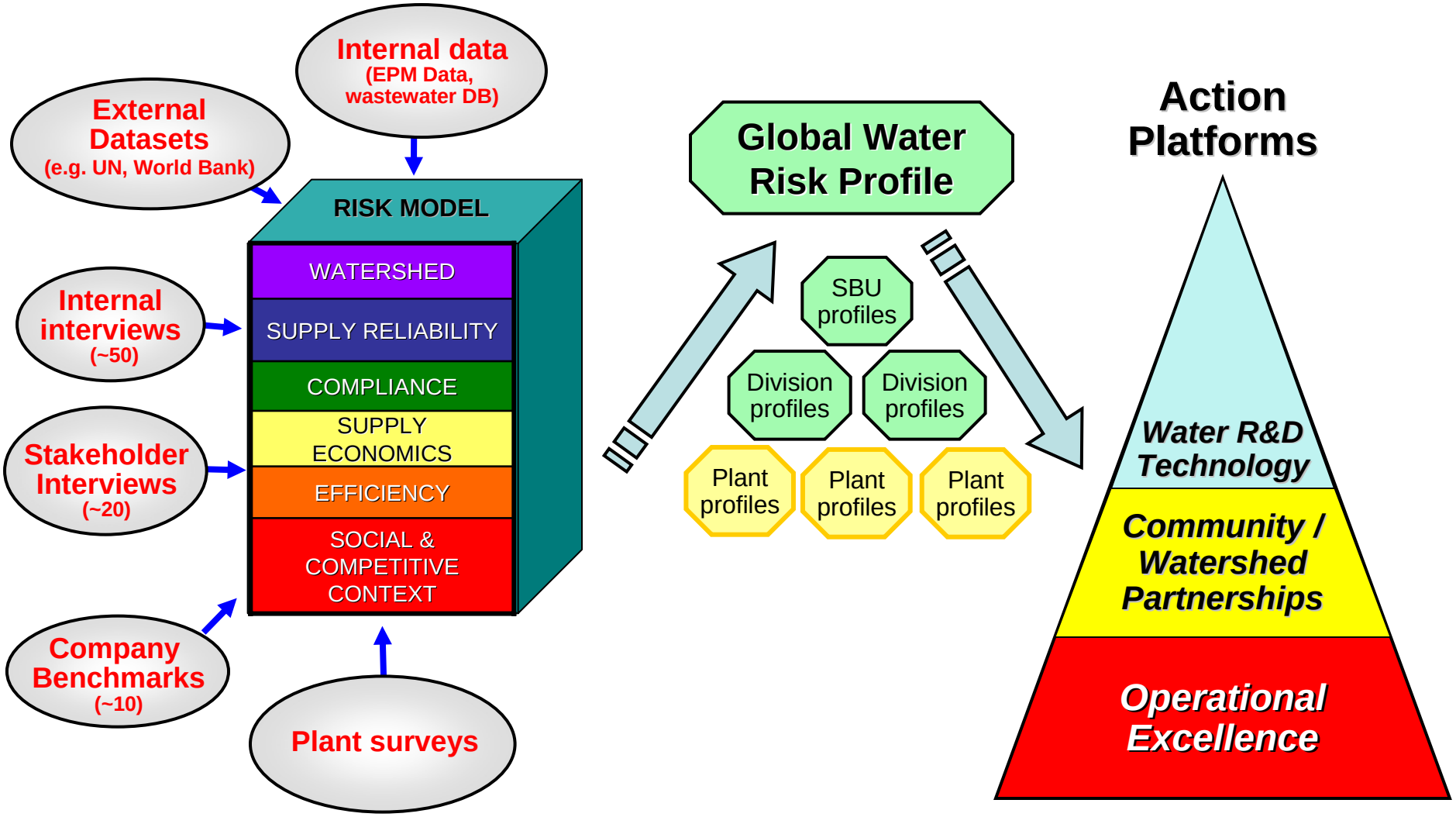

… and identifying solutions.

Global Source Water Management Program

- A comprehensive source water strategy using internal and external water experts and cross functional teams to develop, implement and improve source water management within the TCCC system.

- Ensure that everyone in our system understands water as a natural resource, an important ingredient and an integral constituent in our lives and business.

- Set goals to improve water quality, preserve quantity for expansion and sustainability and expand internal knowledge.

Aquifer Protection Studies and Strategies

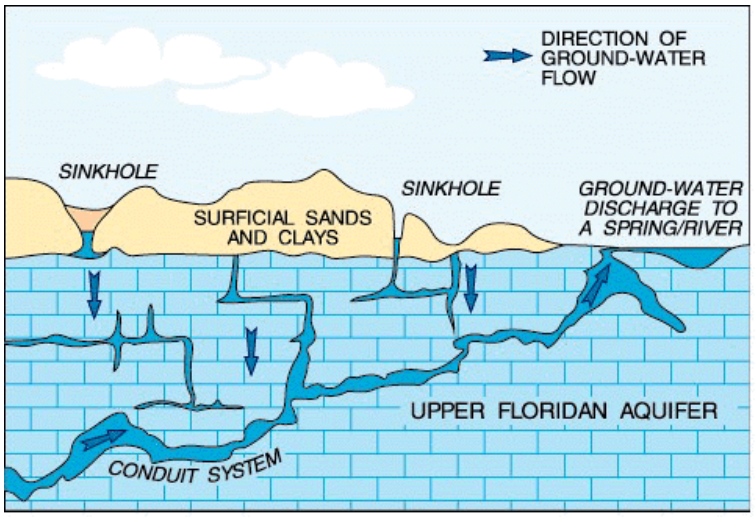

Figure 1. Generalized cross section in the Suwannee River basin showing karst features

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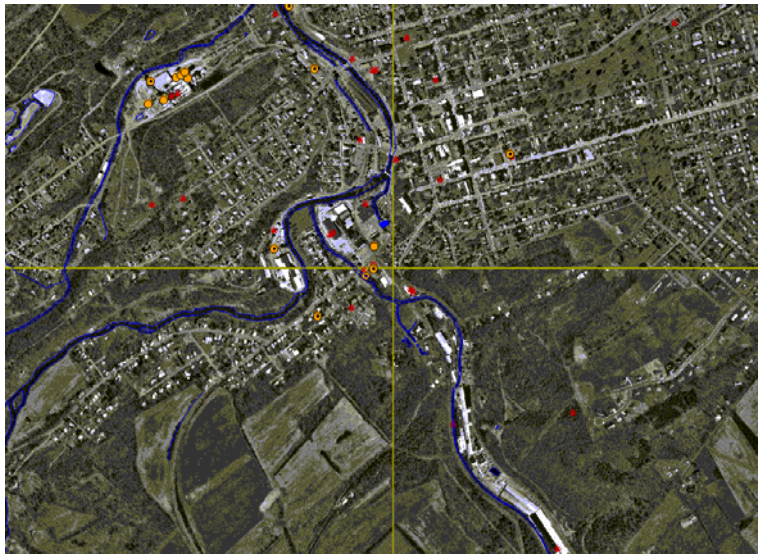
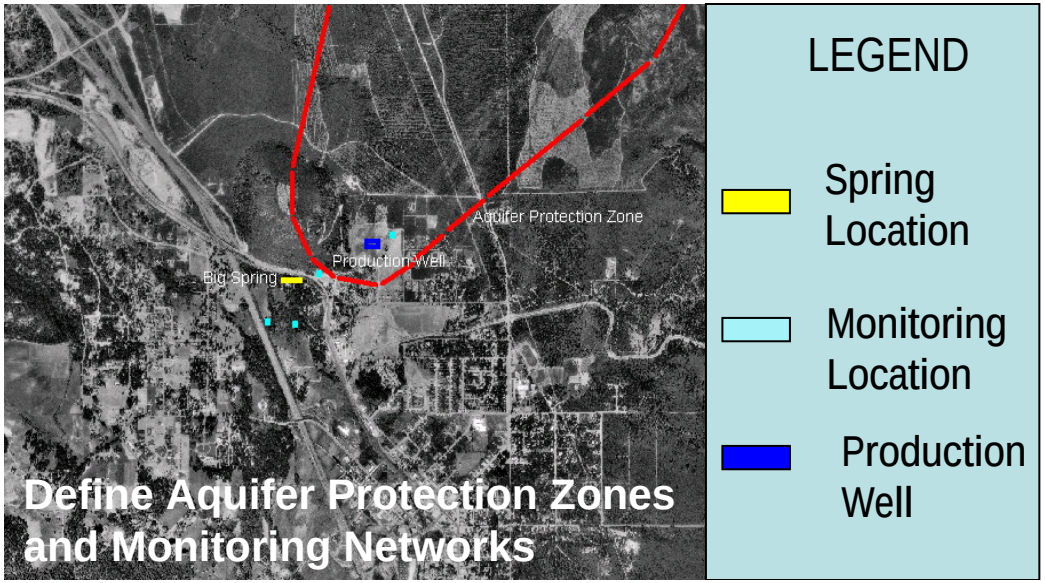
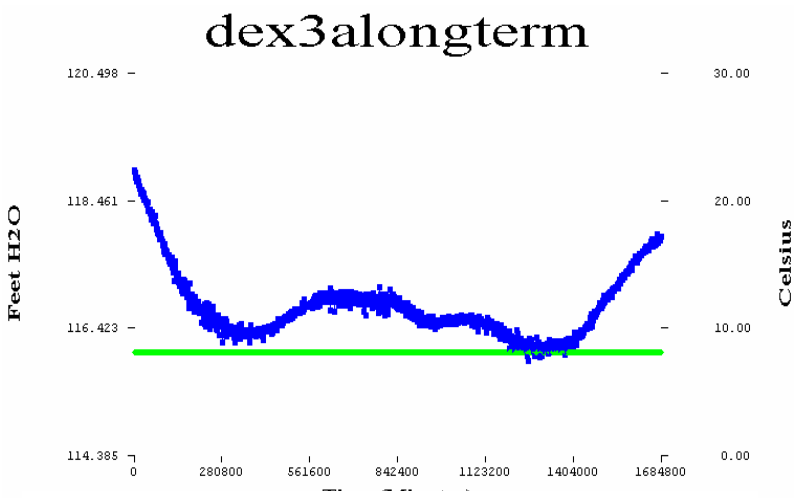


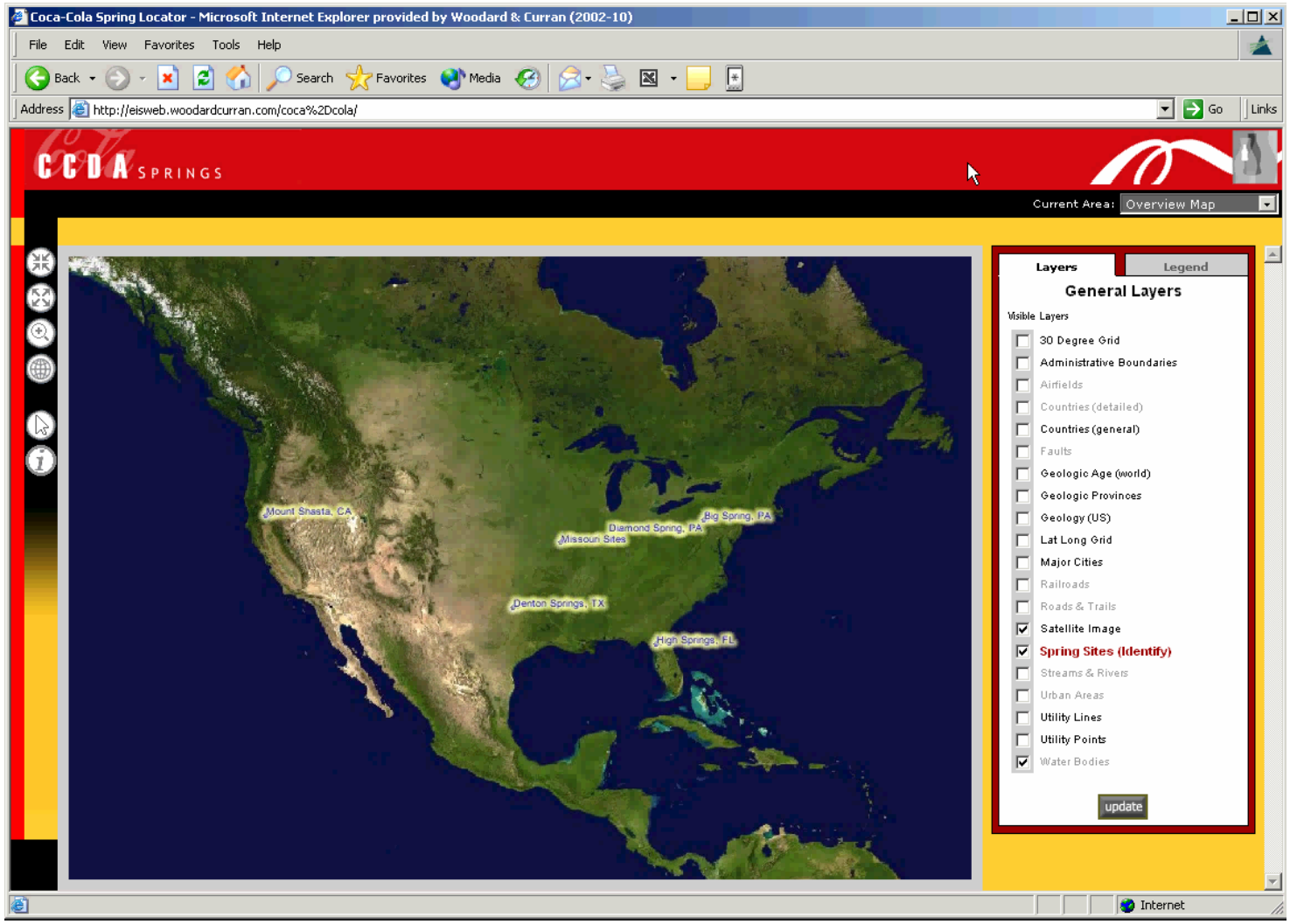
Identify Potential Pollution Sources





Data Management and Modeling

GIS and Data Management Systems



Watershed and Aquifer Protection Research and Information Needs

- Approx. 12% of TCCC plants in North America are on private supply
  - Need to understand issues that can face our industry at the municipal or supplier level.
- Government or Private/Public Sponsored Hydrologic and Hydrogeological Specialized Studies and Modeling
  - Cooperative interaction with water suppliers and regulatory agencies
  - Electronic Reports and Data, easily downloaded or uploaded
  - Basin budget models – safe yields on local scale
  - Land use – Better understanding of impacts
  - Drought definitions and contingency planning – Long term effects
  - Link of drawdown and long term impact to aquifers - what is overdraft?
- Monitoring
  - Hydrologic System Parameters: Precipitation, Water Levels, Quality etc.
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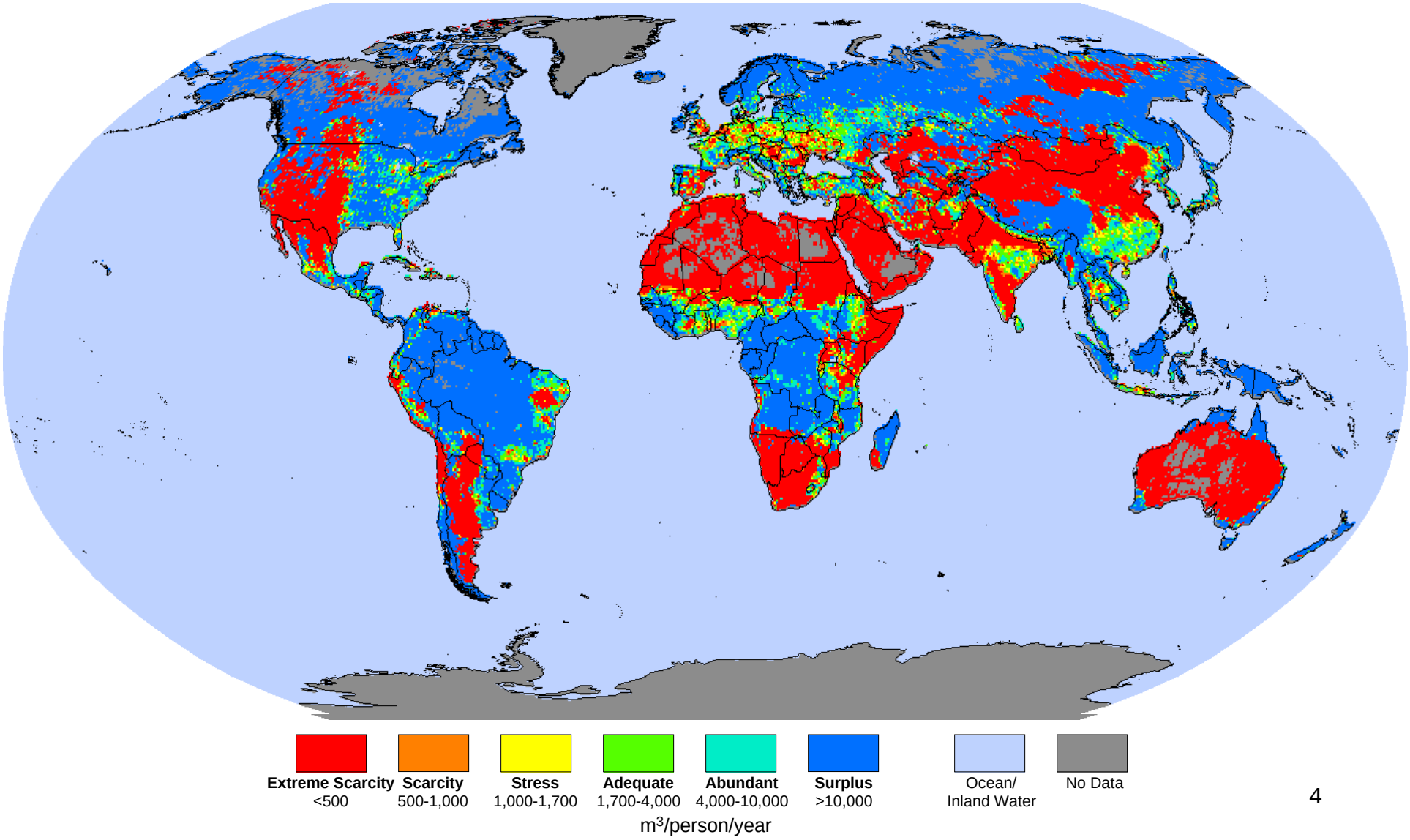

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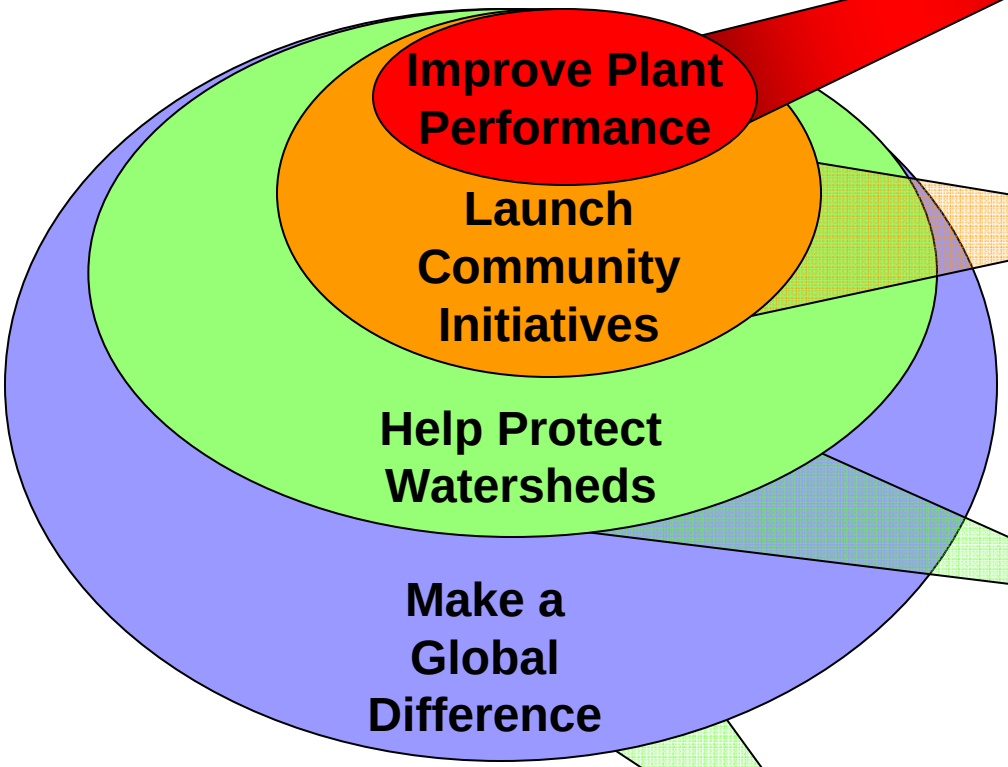

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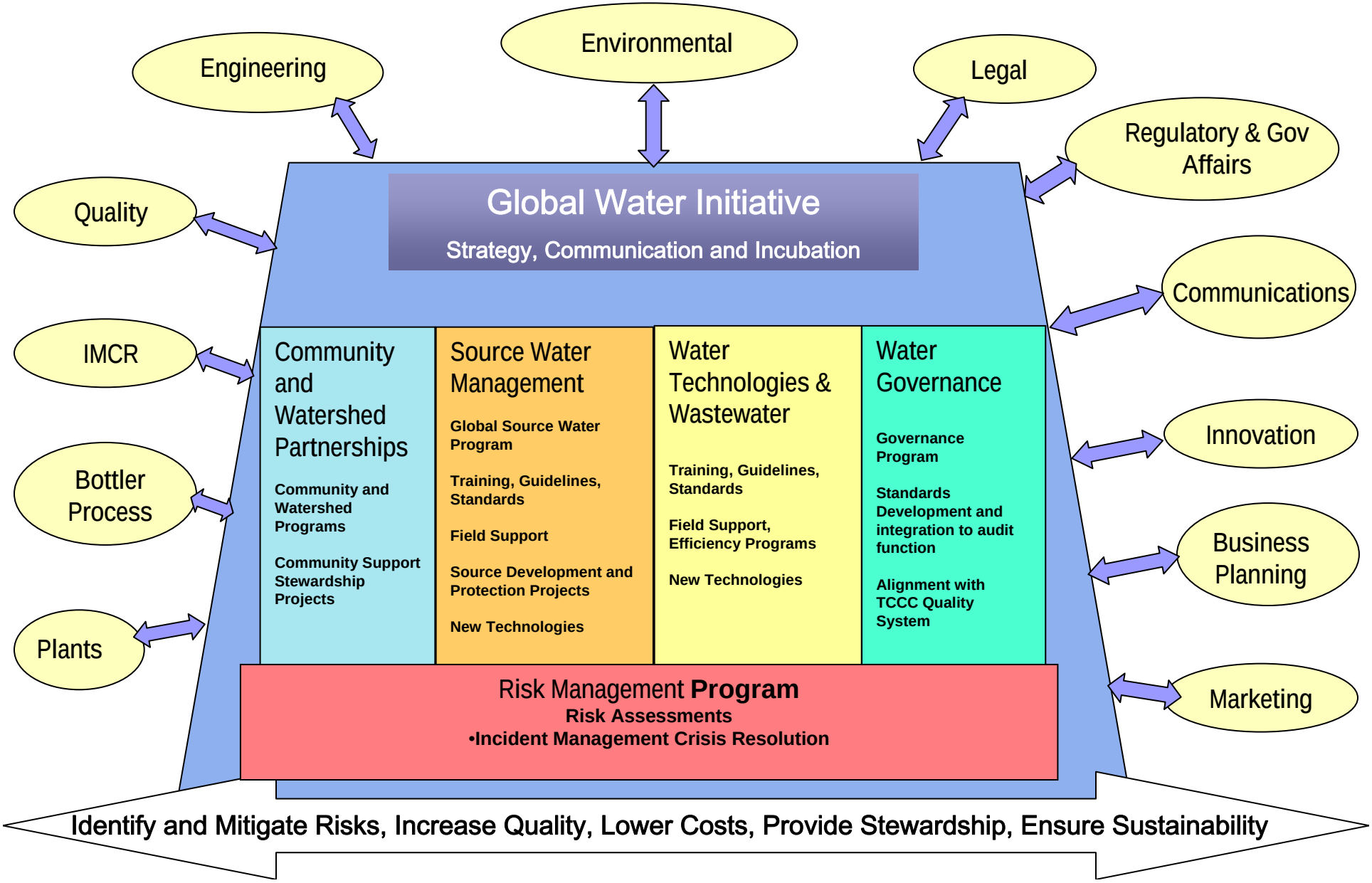

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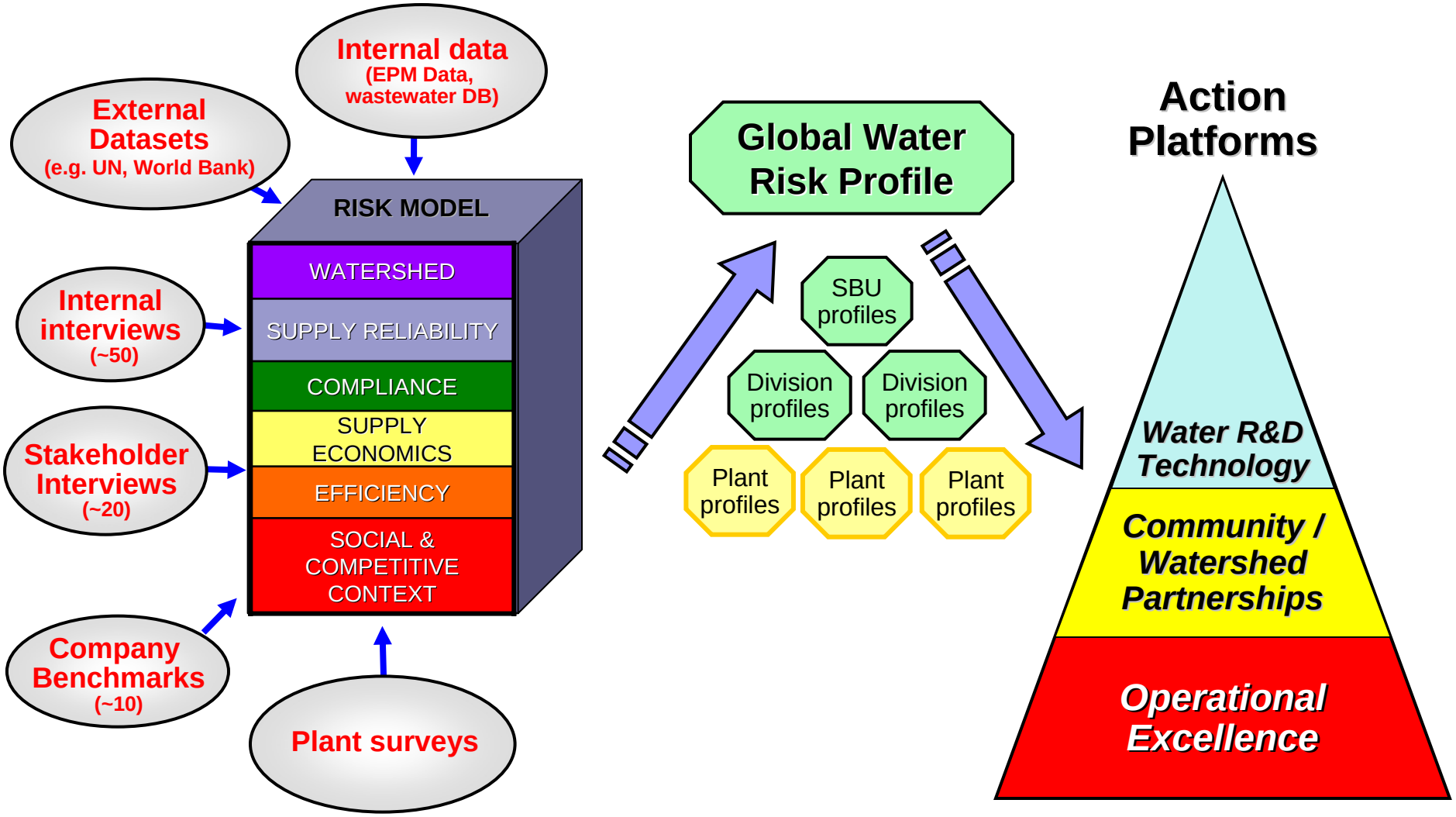

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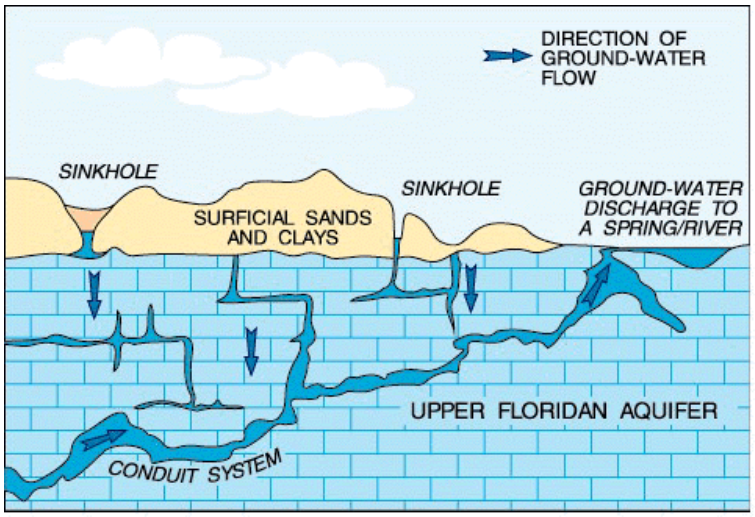

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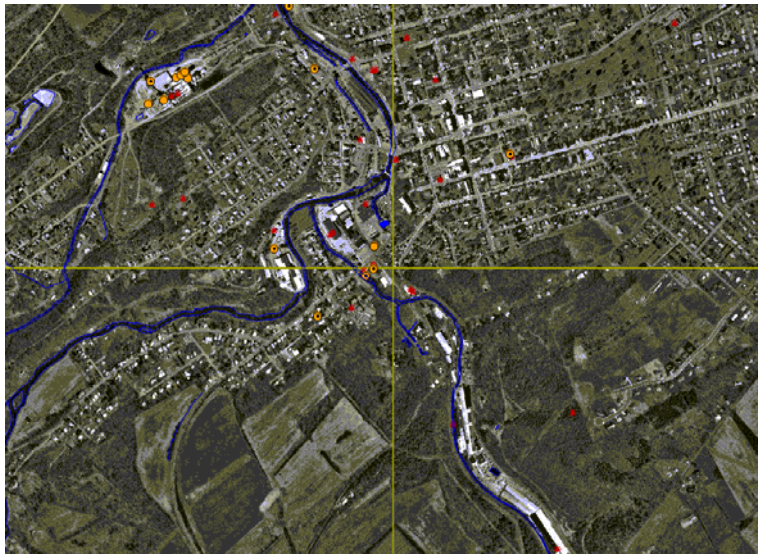

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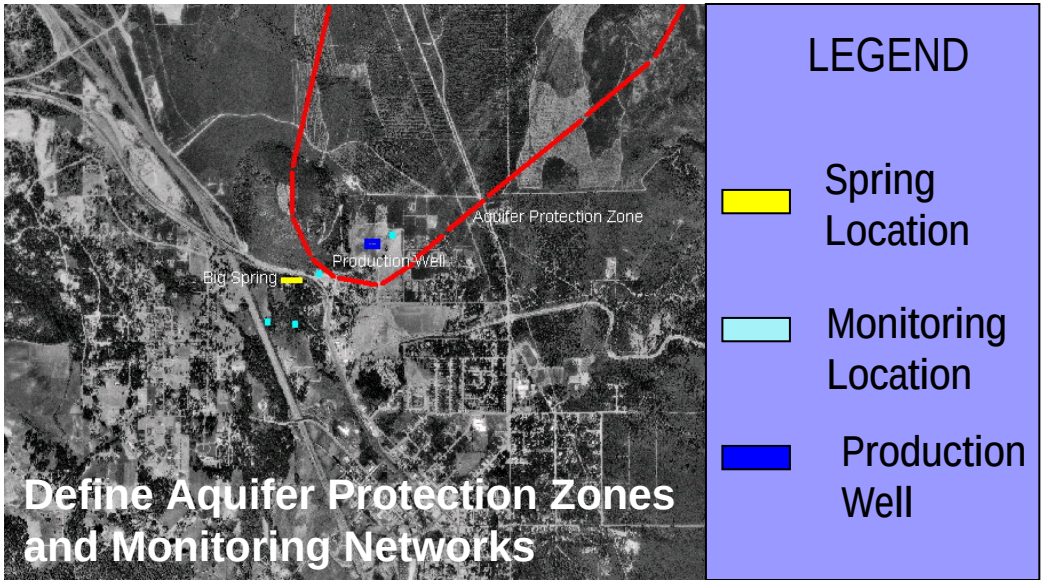

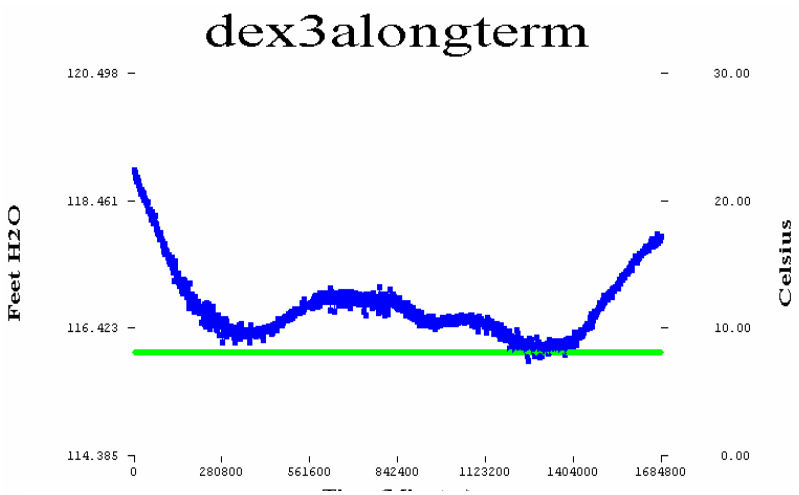

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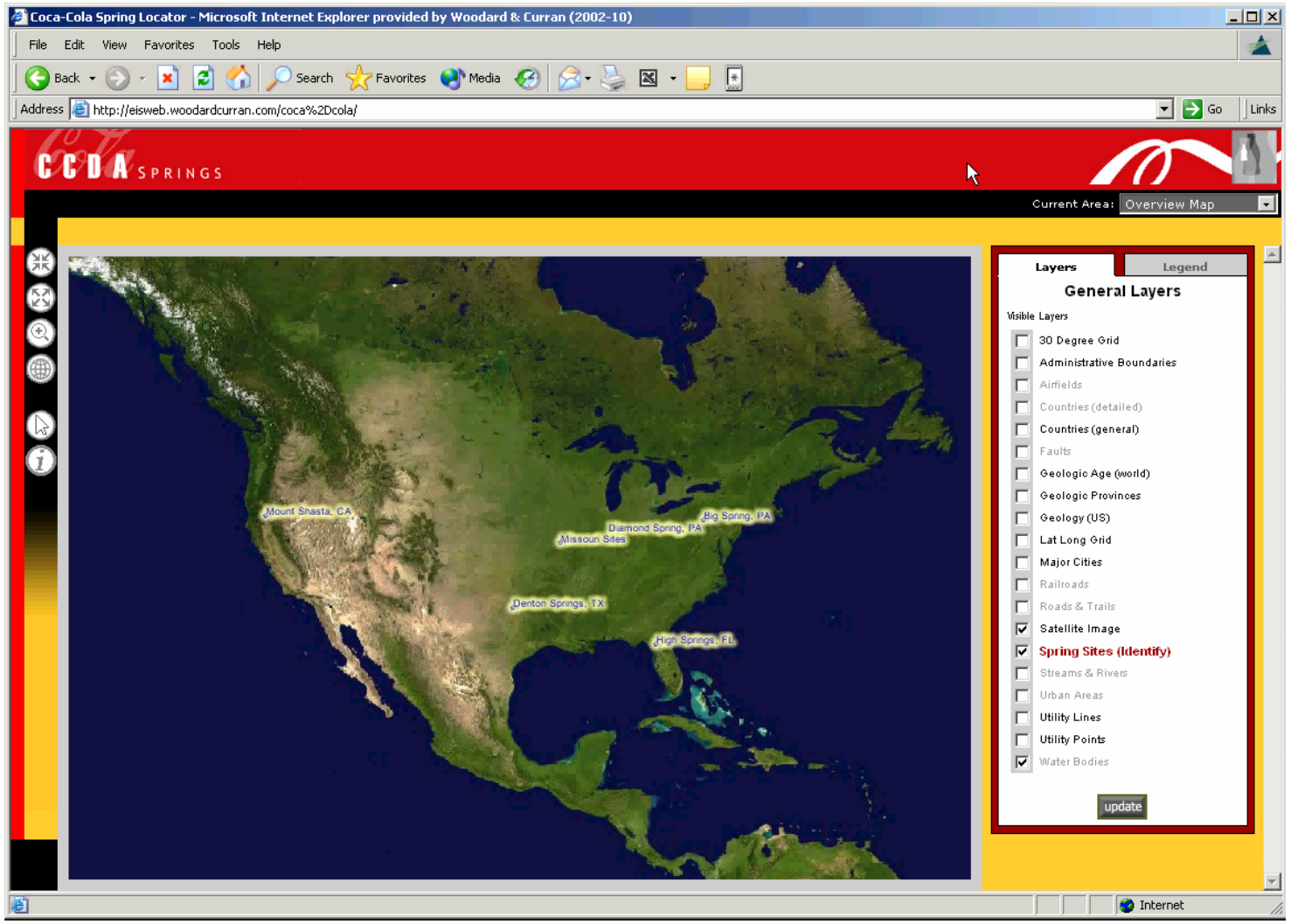

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American Iron and Steel Institute

Great Lakes

Sustainable Water Resources Roundtable

April 5-6, 2005

Ann Arbor Michigan

Integrated Steel Mill Components

Where Is Steel Used?

- Defense
- Transportation
- Construction
- Energy

- Appliances
- Furniture
- Food Services
- Hardware

Steel Making Requirements: HEAT and WATER

- Direct Contact & Cooling
  - Cooling / Rinsing of Product
  - Cooling & Cleansing of Produced Gasses & Air Emissions
- Non Contact Cooling Water (NCCW)
  - No Contact with Products
  - Cools Equipment
  - Once Through Water
- Steam Generation - Boilers

Heat Removal Requires WATER

Water Usage

- Once Through NCCW
  - Coke 60-90 MGD
  - Iron Making 90-110 MGD
  - Steel Making 100-130 MGD
  - Finishing 85-100 MGD
  - Seasonal Variance
- Recycle and Recirculate

NPDES

(National Pollution Discharge Elimination System)

- Regulates Wastewater Discharges
- Effluent Limit Guidelines (ELG)
- Water Quality Based Effluent Limits
- CWA 316(b) Intake Structures
- 5-Year Renewal Cycle
- Extensive Monitoring & Reporting

Steel's Environmental Record

- **Substantial Decrease in Water Usage**
  - **Recycle, More Efficient Production**
- **Tightly Controlled Effluent Constituents**
  - **ELG & WQBEL**
- **Air Emission Controls**
- **ISO 14001 Certification**

A Peregrine falcon, part of a breeding pair residing at a sinter plant, is a familiar sight to employees.

This unused area of oak savannah prairie is set aside as habitat for the endangered Karner blue butterfly.

Steel's Environmental Record

- Steel Recycling
- Mercury Reduction
- PCB Reduction
- 33 / 50 TRI
- EPA Performance Track
- Brownfield Development

Steel Industry Challenges

- Increasing Environmental Regulations
  - TMDL
  - Intake Structures 316 (b)
  - Air and Solid Waste
  - Lower Detection Ability
  - Binational Agreements
    - Great Lakes Initiative
    - Annex 2001
- Conflicting Regulations
  - Evaporative Water Loss vs Once Through
- Competitiveness

Recommendations

- Base regulations on peer-reviewed scientific fact
- Research to better understand impacts of Great Lakes water levels
- Develop regulations holistically and with a clear understanding of what is controllable

Pulp and Paper Manufacturing and Sustainable Water Resources

Jay Unwin
Douglas McLaughlin
NCASI
Northern Regional Center
Kalamazoo. Michigan

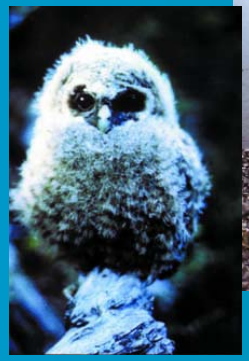
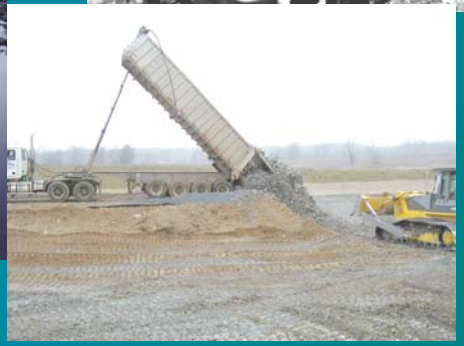
Sustainable Water Resources Roundtable
Ann Arbor, Michigan
April 5, 2005

Technical Studies for the Forest Products Industry

- Industry supported
- $12 million annually
- ~250 projects
- 400+ person-months
  - ~half water-related





Tied to the Natural Environment

Papermaking Depends on Water

SWR Research Needs - General

- Define Sustainable Water Resources
  - What is it?
  - How do we know when we have it?
    - Valid indicators
  - What is it worth?

No definitive answers?

- How about doing the best we can within the bounds of what seems to make sense?
  - Economic sustainability makes sense
- Move *toward* minimum adverse environmental impact
  - Study environmental impacts
  - Reduce quantity
  - Improve quality

Research Needs – Environmental Impacts

- Environmental Fate & Effects
  - In Situ
  - In Vitro
  - Modeling

Research Needs - Quantity

- Potential Adverse Environmental Impacts
  - Wetlands
  - Shorelines
  - Sensitive habitats
  - Groundwater

Research Needs - Quantity

- Reducing the Quantity Impacts
  - Manufacturing (P2)
  - Water Reuse
    - Corrosion & biofouling
    - Cooling & heat exchange
    - NPE (maybe not what you think)

Research Needs - Quality

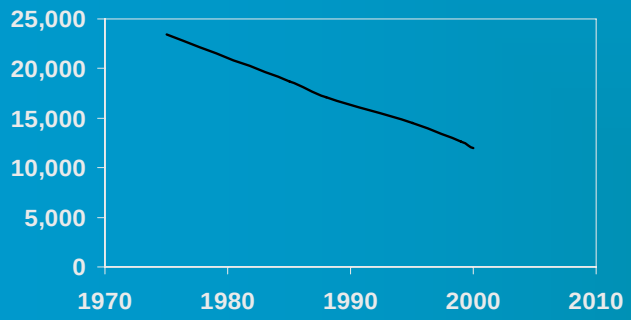
- Potential Adverse Environmental Impacts
  - Aquatic Life
    - Oxygen Demand
    - Suspended Solids
    - Nutrients
    - Color
    - Heat
    - Trace substances/additives
  - Terrestrial Life (incl. human)
    - Organoleptics
    - Trace substances/additives

Research Needs - Quality

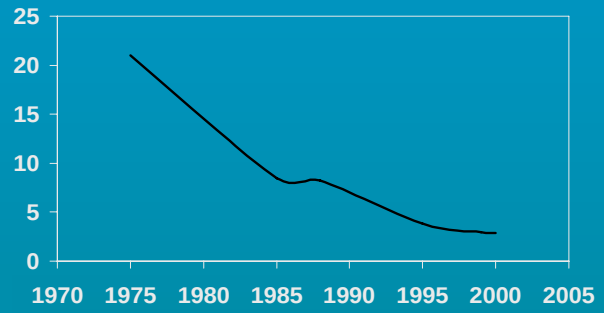
- Reducing the Quality Impacts
  - Manufacturing (P2)
  - Water Reuse
  - Treatment technology
    - Upgrade/optimize
    - Modeling

Progress

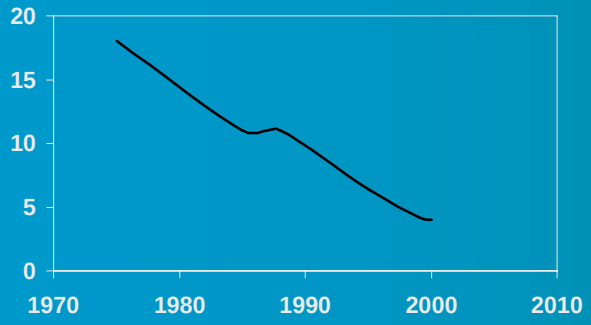
Effluent flow, gallons/ton



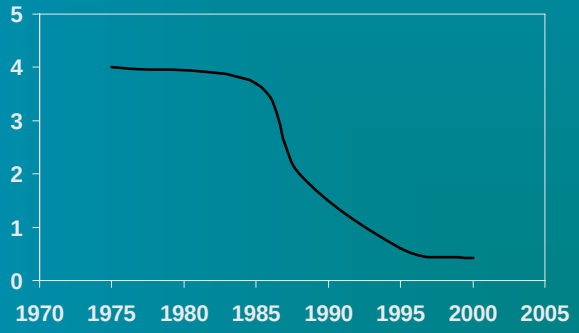
BOD, lb./ton



TSS, lb./ton



AOX, kg./tonne



Source: AF&PA 2001

Lake Carriers' Association

Founded 1880

The Greatest Ships on the Great Lakes

Glen G. Nekvasil
Vice President - Corporate Communications
Lake Carriers' Association

RESEARCH NEEDS TO PROMOTE GREAT LAKES SHIPPING

Sustainable Water Resources Roundtable
April 5-6, 2005 • Ann Arbor, Michigan

Lake Carriers' Association

- Founded 1880; among nation's oldest trade associations.
- Represents U.S.-Flag Great Lakes fleets.
- 13 members, 55 vessels.
- Carried 111 million net tons in 2004.
- Capacity for 125 million net tons.

Great Lakes Shipping

- More than 200 million net tons of cargo a year.
- Mostly raw materials.
- Virtually no container trade.
- Most cargo moves domestically.
- U.S./Canada trade next biggest segment.
- Grain primary overseas export.

Major Cargos

- Iron ore for steelmakers – 70 million net tons.
- Coal for utilities – 40 million net tons.
- Limestone for construction – 25 million net tons.
- Fluxstone for steelmakers – 15 million net tons.
- Grain, salt, cement – 35 million net tons.

10-Month Season

- Dry-bulk trades: Early March to late January.
- Soo Locks: March 25 – January 15.
- Seaway: Late March - Christmas.
- Liquid-bulk trade year-round.

Research Needs

- Economic impact.
- Environmental benefits.
- Non-indigenous species in ballast water.
- Dredged sediment.

Economic Impact

- No single, comprehensive analysis.
- Value of cargo.
- Number of jobs: Direct and indirect.
- Industries/jobs lost if shipping decreased or ceased.
- Industries/jobs created if shipping increased.

Environmental Benefits

- Ships use least amount of fuel.
- Produce fewer emissions.
- Quiet.
- Don’t clog highways.
- Interference rare – no rail crossings.

Non-Indigenous Species

- Enclosed Aquatic Ecosystem.
- Ocean-going vessels introduce exotics.
- Lakers confined to Lakes.
- Filtration has shown promise.
- Secondary treatment likely necessary.
- System must fit vessel type and trade routes.

Dredged Sediments

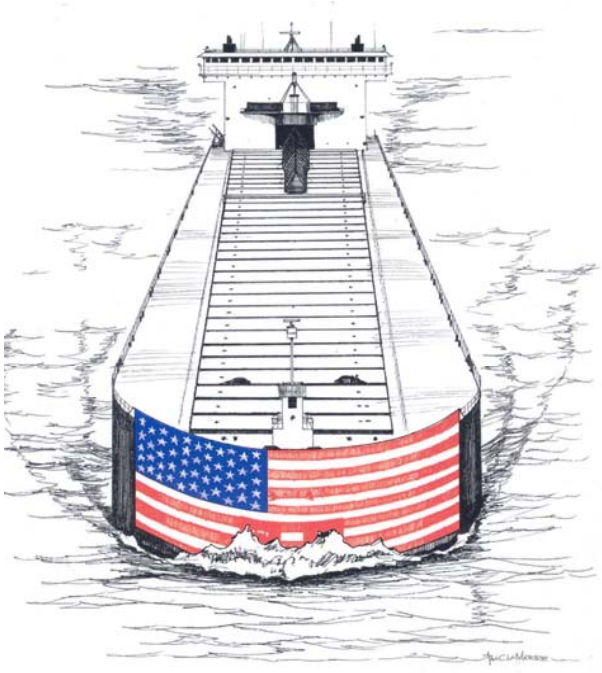
- Confined Disposal Facilities (CDFs) filling.
- Difficult to find locations for new CDFs.
- Process takes years, even decades.
- Open Lake disposal suitable for clean sediment.
- Other options: Beach nourishment, shoreline restoration.

Summary

- Shipping important to economic future.
- Better understanding of value will bring more Federal dollars back to region.
- Waterborne commerce promotes Environment.
- Stop new introductions of invasives; what's here is here to stay.
- Utilize clean sediments rather than fill CDFs.

LAKE CARRIERS' ASSOCIATION

www.lcaships.com



QUESTIONS