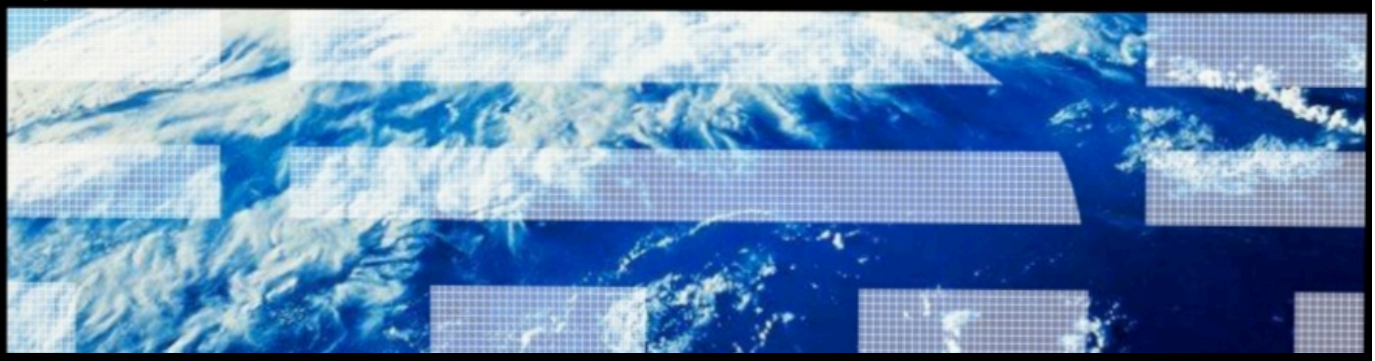
Let's Build a Smarter Planet:
Smarter Water Management

7th Annual Massachusetts Water Resources Conference
April 8, 2010



Something profound is happening…

INSTRUMENTED

We now have the ability to measure, sense and see the exact condition of practically everything.

INTERCONNECTED

People, systems and objects can communicate and interact with each other in entirely new ways.

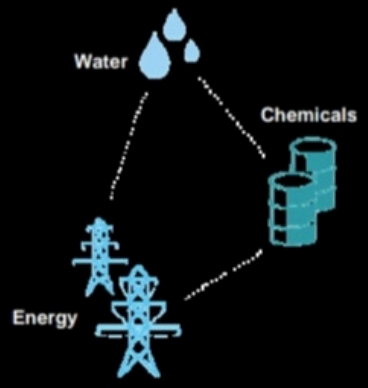
INTELLIGENT

We can respond to changes quickly and accurately, and get better results by predicting and optimizing for future events.

Intelligent systems that gather, synthesize and apply information will change the way entire industries operate.

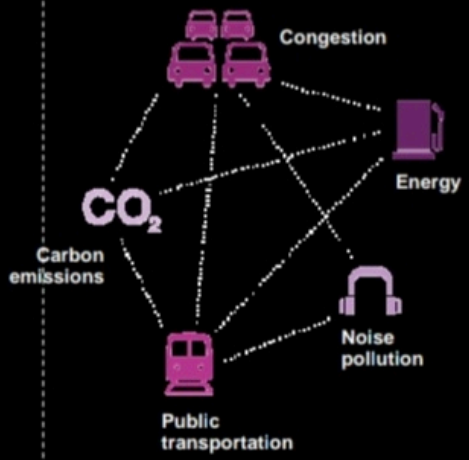
Smart water

Apply monitoring and management technologies to help optimize the availability, delivery, use, and quality of water as well as related systems including energy and chemical treatment.



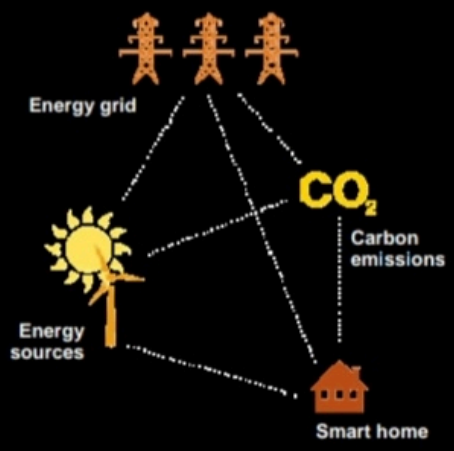
Smart traffic

Use real-time traffic prediction and dynamic tolling to reduce congestion and its byproducts while positively influencing related systems.



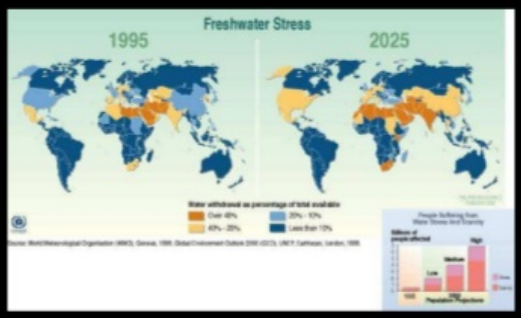
Smart energy

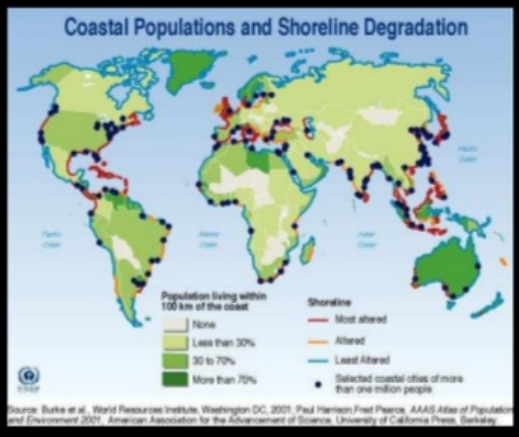
Analyze customer usage and provide customized products and services that help to boost efficiency from the source through the grid to the end user.



Water Management is an urgent and complex global issue

- Agriculture, domestic and industrial sectors impacted by increasing demand and limited supply
- Infrastructure is aging and failing
- Climate change is forcing drought mitigation measures and flood management strategies
- Fragmented water management domains and conflicting interests of stakeholders
- Worldwide energy needs drive water needs, and vice versa
- Regulatory frameworks force decisions

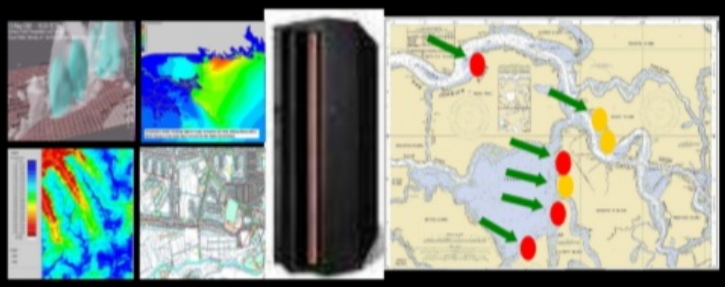




The Smart Water Network' - a 21st Century System

Information Technology Enables Smarter Water Management

- Sensing and monitoring of physical infrastructure, integrated with proactive asset management
- Streaming data systems for critical operations, enabling rapid, real-time decision making
- IT infrastructure to manage information across multiple water organizations & constituents, enabling system-level decisions
- Advanced analytics with predictive capability and modeled decision support
- All enabling more efficient operations and providing decision support capability



Smarter Water Management is critical at three "scales"

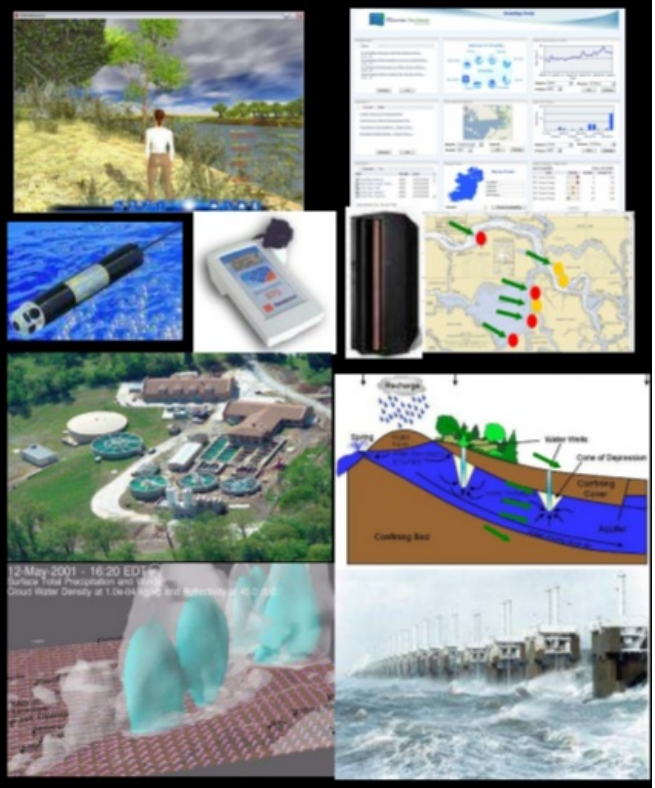
Natural scale
- Water resource mapping and availability
- Water quality monitoring and management (surface and subsurface)
- Land use analysis
- Extraction monitoring (surface and subsurface)
- Flood control

Utility scale
- Water quality and usage
- Discharge, combined sewer overflow
- Asset management
- "Smart levees" and levee monitoring systems
- Weather event assimilation
- Energy management

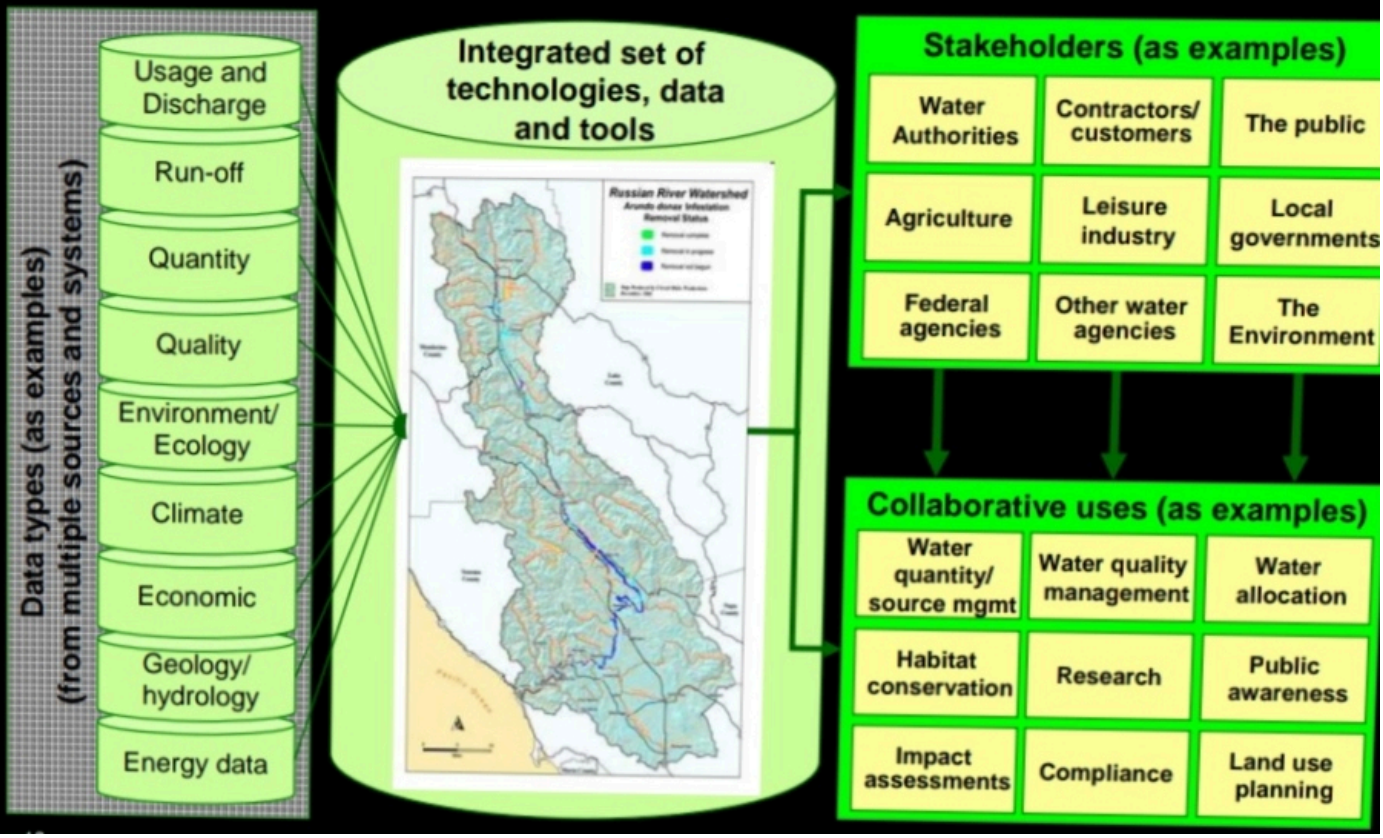
Enterprise Scale
- Water usage tracking
- Water quality control (into and within plants, discharges)
- Supply chain optimization
- Energy management
- Business process improvements
- Metrics and management

Strategic Water Information Management Platform

- Intelligence networks applicable to Enterprise Water Management, Water Infrastructure Management, Water Resource Management scales
- Provides automated sensing of physical environments
- Provides water quality, quantity, integration, storage, analysis, modeling, and a management dashboard on a local or regional basis
- Provides records management and reporting capabilities for regulatory and compliance requirements.
- Provides energy usage information to pinpoint energy efficiency opportunities related to water
- Provides advanced asset management and advanced meter management capabilities
- Provide intelligence to proactively manage risk related to extreme weather events



Strategic Water Information Water Management platform usage



Benefits of an integrated, reliable, secure & scalable platform

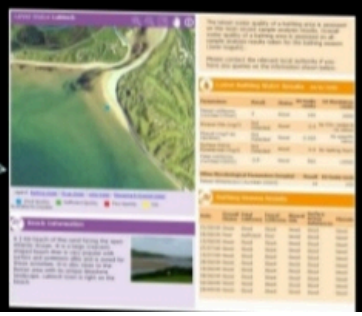
Integrated set of technologies, data and tools

- Builds trust between different stakeholders - less "my data says this, your data says that", greater disclosure
- Enables higher levels of collaborative decision-making
- More rational water management decisions - greater likelihood of data being available as required to enable the best decision
- Provides a "roadmap" for coordinated information systems development
- Reduced operational risk - integration of drought management, flood control, pollution management
- Enables coordinated system-wide response to issues such as climate change and development
- Reduces redundant effort on data collection - information more likely to be available and integrated when needed
- Reduces marginal cost of future data collection and research exercises

Smart Bathing Water Quality Monitoring Project with Ireland EPA

- Developed in collaboration with Ireland EPA, the portal provides up to date information about bathing areas across the country.
- The map-based website, provides the latest information, supplied by local authorities, on compliance status with EU bathing water quality standards at the 131 designated bathing sites around the country.
- Anyone setting out for the beach will be able to log on and see the latest results of water quality along with details such as lifeguard availability, blue flag status, tides and weather forecast
- Bathing water quality data that is uploaded directly to the site by local authorities will be used by the EPA, to assess the overall compliance of a bathing area with EU standards,

http://www.bathingwater.ie/

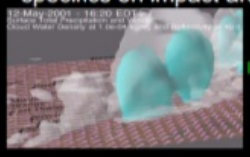


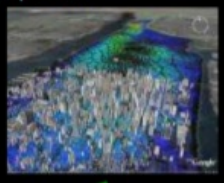
Smarter Stormwater Management - Optimizing Existing System Capacity

Innovative technologies such as Smart Manhole Covers are used to detect sewer flow levels

Wireless network links monitoring devices to central command center

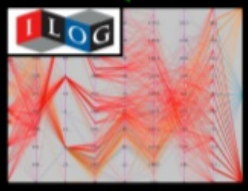
High resolution weather and flooding models are used to generate accurate flood maps with specifics on impact areas



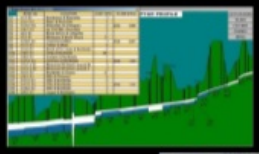


Stormwater Management Command Center

Data can also drawn from more traditional SCADA/sensors systems.



Advanced analytics and optimization engines generate recommended actions for flood avoidance



Sewer system data can also be linked with asset & workflow tools to manage any specific maintenance requests

Valves, pumps or inflatable dams are controlled dynamically to balance inline sewer storage and avoid potential overflows.

Smart Water Metering: managing customer water use in areas of increasing water stress

IBM / partner install, upgrade and/or network advanced wireless meters in homes and businesses.

Meters report as frequently as every 15 minutes either via cellphone or Wimax, or less frequently via short range protocol to a drive-by reader.

IBM installs or provides as a service the main billing system, or can run the entire billing service on an outsourced basis.

IBM Maximo / SAP enables meter management and maintenance - meter performance and failure can be tracked remotely.

Meters can provide the home or business owner with immediate data on water consumption. This is known to promote water economy

The system as a whole provides more granular data on usage trends and can alert of immediate and longer term problems.

More accurate meters provide better information in assets to inform capital & operational investment decisions

We've only just begun to uncover what is possible on a smarter planet.

The world will continue to become smaller, flatter and smarter. We are moving into the age of the globally integrated and intelligent economy, society and planet.

By systemically managing water and energy use, as well as carbon emissions, smart organizations will realize true sustainability while achieving real business benefits—driving growth at the individual, organizational and population levels.

Let's work together to drive real progress in our world.