



Advantage Cleveland:

Water Is An Asset Of Rapidly Increasing Value

Cleveland Water Alliance (CWA) - background

Water Innovation Cluster (Water and technology based Economic Development)

A network of leading corporations, regional universities and research institutions, public agencies, stewardship organizations and utilities.

Mission: To coordinate, facilitate, and foster economic development through a water innovation cluster while elevating the conversation about the **value of water to our region.**

Some of Our Programming:

Accelerate Innovation: Working with more than 200 plus water related companies, accelerators, incubators and research institutions to bring water solutions to the market. Areas include conveyance, sorbents, electrocoagulation, filters, plasma-based water treatment, storm and green storm water solutions, financing, coatings, hydrodynamic cavitation, monitors/sensors, data, distributed systems.... (goal of 3,000 net new jobs by 2021)

Collaborative Research: Value of Water NEO Study

- Phase 1 (initial boundary study, completed)
- Phase 2 (“detailed assessment” (2016)
- Broad Array of Values – **direct, indirect and induced economic values and opportunities**

Water Enabled Business and Industry Strategy

Biomimicry Water Fellow

Private Public Partnership (p3) with ODNR's Office of Coastal Management, and University of Akron

RESEARCH PROGRAM- The Biomimicry Fellow will pursue PhD research through the Integrated Bioscience PhD Program at the University of Akron in the following areas:

Goals:

- Developing biomimicry inspired solutions to improve water quality associated with stormwater runoff, point source discharge and urban shoreline stabilization;
- Preparing design guidelines, protocols and policy frameworks for integrating the biomimicry process into stormwater management, green infrastructure and shoreline stabilization/enhancement, and;
- Delivering workshops to interested private and public sector groups, all with a focus on the Northeast Ohio region.

Currently recruiting a Ph.D. Candidate, additional fellows in 2017



March 22, 2016
Press Release by the White House

In conjunction with the United Nation's World Water Day, the Obama Administration hosted the first ever White House Water Innovation Summit to shine a spotlight on the importance of cross-cutting, creative solutions to solving the water problems of today, as well as to highlight the innovative strategies that will catalyze change across the ways in which we use, conserve, protect, and think about water in the years to come. The Cleveland Water Alliance through its Water Innovation Cluster was featured and commended on its innovative efforts towards building the foundation for a sustainable water-centric economy in Northeast Ohio and setting the standard for a national audience.

Announcement #1
Bio- and Eco- Mimetic Water Innovation Program

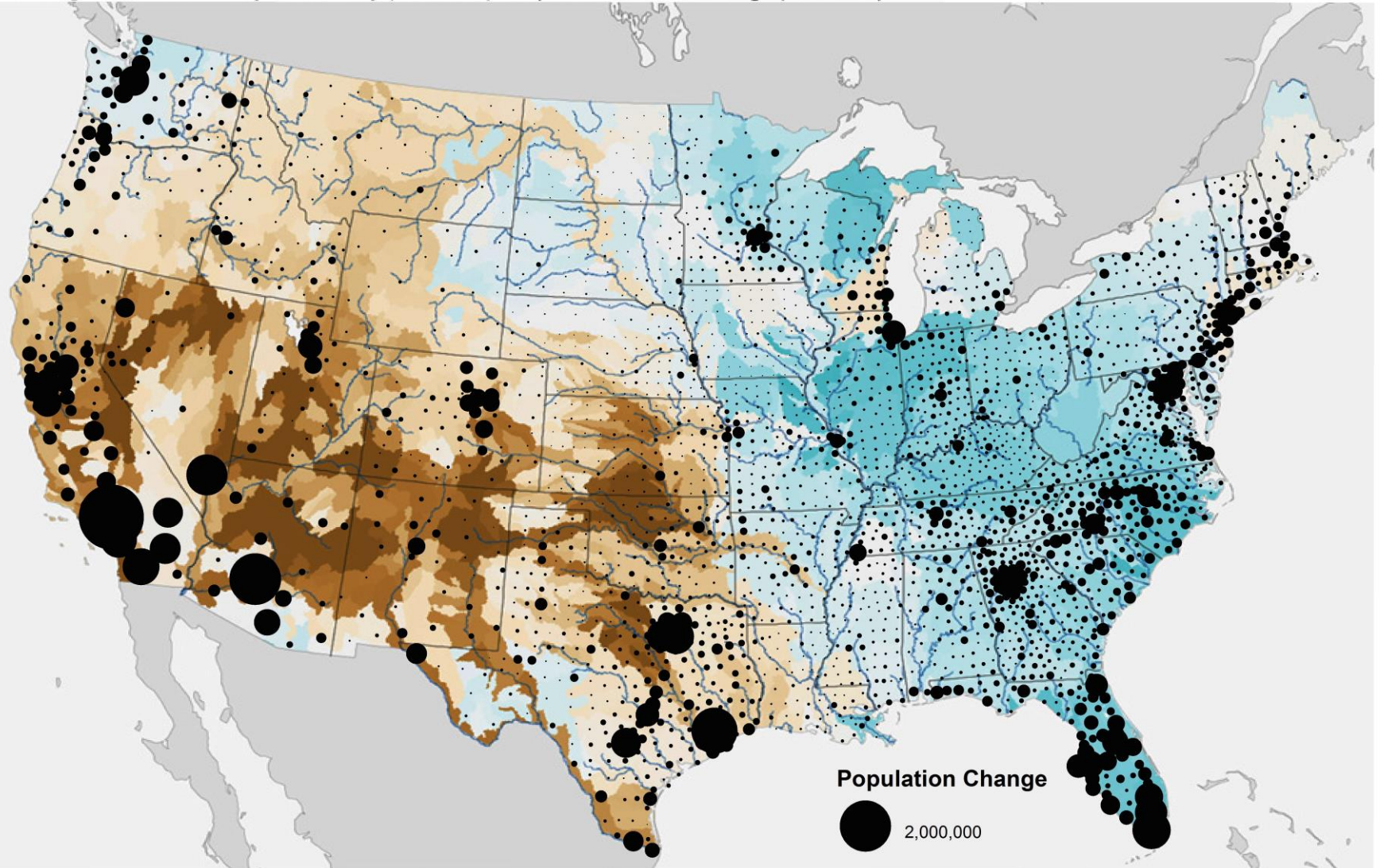
Announcement #2
Value of Water Research

Cleveland Water Alliance (CWA)

- Drivers
 - Water in increasing in VALUE
 - Water rates outstripping inflation by 18% in US
 - Population growth
 - Aging infrastructure
 - Water regulation
 - Extreme weather events and climate change
 - Increase in P3s to de-risk innovation by infrastructure
- **More than half of world's population** will be exposed to severe water scarcity by 2050 (4.8 billion people)
- **22%** of world's GDP (\$9.4 trillion at 2000 prices) is produced in water-scarce areas
- Growing corporate recognition on water reliability: cost of borrowing, risk mitigation, insurance rates, avoided treatment costs, revenues/downtime
 - Northeast Ohio Water: \$6Billion in direct economic impact with \$21B in total direct, indirect and induced economic impact total
 - Water employment growth: 7.9%

2010-2040 Population Change by County

Projected change in water stress* by mid-century (2040-2061) compared to historic average (1900-1970)



*based on projected changes to surface water supplies, and no change in demand or groundwater availability



Population Change



NOAA Climate.gov

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Water Enabled Business and Industrial Strategy

Water Enabled Industry Strategy

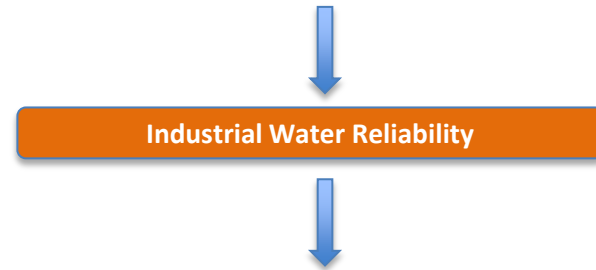


Exhibit 7. Percent of total Ohio water-enabled industry jobs, for selected industries

Target water-enabled industry	Number of Ohio jobs	Percent of total Ohio water-enabled industry jobs
Advanced manufacturing	56,561	32.6%
Polymers and chemicals	17,737	10.2%
Food processing	8,235	4.7%
Automotive	12,192	7.0%

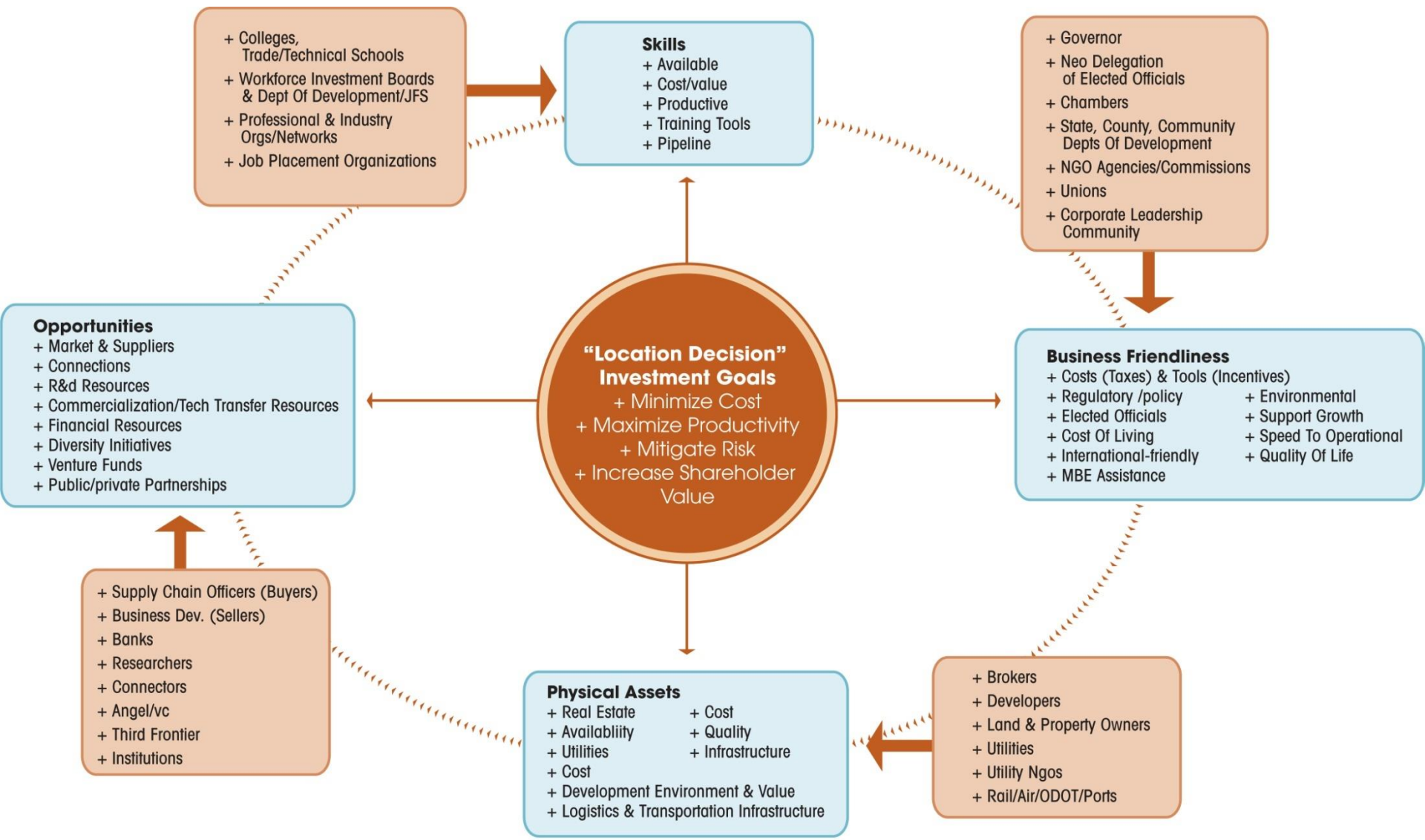
Data source: Team NEO from Moody's Analytics.

- Research on the needs and challenges facing water enabled industry (Value of Water Phase 2 with support of Coca-Cola Foundation)



- Responsible water enabled industrial business attraction program and sales module for region. Incorporated by TeamNEO and starting to socialize within Economic Development system including JobsOhio

Location Decision Factors and Influencers



Risk Assessment

Access to water affects how the market and other financial institutions calculate a company's risk profile

Geographic locations with long term scarcity and drought conditions could increase the cost of borrowing and insurance

En peligro de contaminación
80% del agua de la capital
- El Times

China warns on growing water shortages
Asia-Pacific News

Toxicity Of Industrial Water Pollution Underestimated
ScienceDaily

11 industries face music for polluting Godavari river
India Times

Will Drought Cause the Next Blackout?
- El Times

Elk River Chemical Spill In West Virginia Prompts State Of Emergency Declaration
- El Times

Water being rationed in Brazil

'Cancer villages' alert China to urgent water crisis
MetroNews

In U.S., Water Pollution Top Environmental Worry
- Gallup

“Private, public sector not moving fast enough on water crisis”
- United Nations, World Bank & The International Monetary Fund

On Water Fears
ENS Newswire

Geopolitical Conflicts
Bloomberg

Water crisis grips hundreds of thousands in Toledo area, state of emergency declared
- Toledo Blade

Europe's water resources 'under pressure'
BBC

Farmers And Frackers Wrangle For Water In Shadow Of Calif. Drought
- NPR

Threatens livestock in North Dakota
Drovers Cattle Network

w/permission from SplashLink

Water is a Vital Component

Gallons per Dollar of Final Output

Paint and Coatings Manufacturing (123 Gallons)

Paperboard Mills (36 Gallons)

Cheese Production (8.8 Gallons)

Fertilizer Manufacturing (8.4 Gallons)

Iron and Steel Manufacturing (4.1 Gallons)

Synthetic Rubber Manufacturing (3.7 Gallons)

Water Availability Affects Company's Bottom Line & CSR Impact

For large water industrial users, water is a critical component; A location in Northeast Ohio (NEO) offers a low risk and affordable solution:

Proximity – Available sites near Lake Erie provide immediate access to largest fresh water supply

Capacity – Water and treatment operators have significant available capacity to handle demand

Quality & Use – Exceeds national standards

Reliability – Predictable water supplies

Sustainability – State and region are investing in infrastructure, education and innovation to maintain Lake Erie's water quality

Water Capacity

Northeast Ohio's water departments have excess capacity to supply industrial users looking for growth opportunities:

This is a resilient system with multiple water intakes at different distances and depths in the lake; There are interconnection agreements with neighboring water departments

There is existing high volume infrastructure in place for locations close to the lake

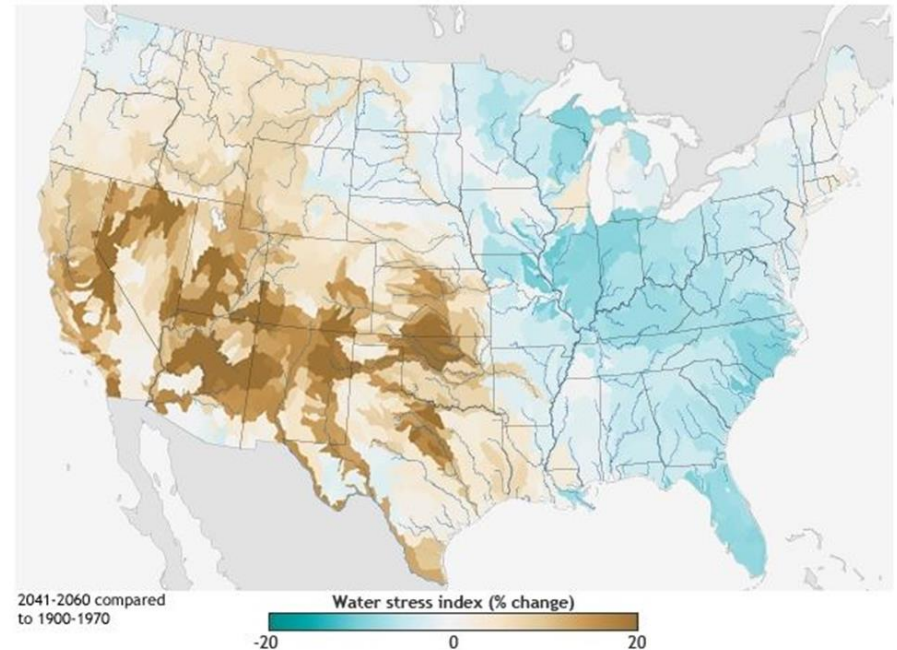
Both land and building options are available in the 5 counties

Water Reliability

A location on Lake Erie provides a predictable water source

Historically NEO uses less water than replenished by rain; Climate models predict that Northeast Ohio will receive as much rain as historical averages

Lake Erie water levels have remained close to long term average



Average for period of record (1918-present)



Source: NOAA

Water Pricing

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Thank you!

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