Water
&
Economic Development
A Thirsty Planet
Forty-six countries currently suffer some degree of “water stress”

B of A Merrill Lynch Global Research believes that the degree of water stress could increase between three and nine times over the next decade.
A Global Problem

1. Demand > Supply

**The current story...**

- 600,000,000 people currently face water scarcity
- 1,000,000,000 people currently lack access to safe drinking water

**The future story...**

- By 2025, 3,200,000,000 people are predicted to suffer from water-stressed conditions
- By 2030, 50% of the world’s population will suffer from water scarcity
“Study the past if you would divine the future”
Confucius
New Mexico Water Uses

- **10%** - Public Supplies and Domestic Use
- **7%** - Evaporation
- **6%** - Livestock, Commercial, Industrial, Mining, Power
- **77%** - Irrigated Agriculture

Source: OSE & ABQ Journal
2013

Bernalillo/Valencia/Sandoval/Santa Fe

1,055,000

2038

1,500,000

+445,000

1,055,000

+389,000

Population increase 1985-2010
Hydrologic Cycle

1,000,000 acre feet average per year flows from Rio Grande

50,000 acre feet
San Juan Chama Water
Cities
53,000 acre-feet
8.45%

River evaporation
40,000 acre-feet
6.38%

Farms
305,000 acre-feet
48.94%

Riverside vegetation
145,000 acre-feet
23.13%

Reservoir evaporation
84,000 acre-feet
13.40%

Source: ABQ Journal-Mid-Rio Grande Water Assembly
Manage & Protect
Conserve
Reuse & Recycle
Adapt
Bosque-Riverside Vegetation
Plant Conservation Alliance Least Wanted List

**Tree-of-heaven** - is a prolific seed producer, grows rapidly, and can overrun native vegetation.

**Russian Olive** can out compete native vegetation, interfere with natural plant succession and nutrient cycling, and **tax water** reserves

**Siberian Elm** - Fast growing seedlings of Siberian elm quickly overtake native vegetation

**Saltcedars** are fire-adapted species and have long tap roots that allow them to intercept deep **water** tables and interfere with natural aquatic systems.

A healthy Bosque must be managed...
Rio Grande Goals:
- 1.7 million acres of forests
- 700,000 acres treated
  or 40% of forests
- 30,000 acres annually
- $7-15 million annually

Watershed Protection
Las Conchas Fire
156,000 Acres

$48 million fire suppression
$19 million lost tourism
$  7 million health-related
(est. total cost $138-$232 Million)

2000 Cerro Grande Fire 47,000 acres…$1.0 billion
Over-accumulation of vegetation/ bio-mass

Property Damage

Extreme Fires
Severe Fires Threaten Water Security

Hydrophobic Soils

Water Quality

Flash Floods
Debris Flows
Sediment

Extreme Fires
Forest Treatments Can Increase Snowpack and Water Yield

30,000 acres yields an additional 3000-6000 +/- acre feet of ground water

Veatch et al. 2009
70% of wood by-product of forest treatments is very low quality

30,000 Acres generates 600,000 tons of bio-mass

Labor to harvest bio-mass = 300-600 jobs

- Rural Economic Development
- Job Creation
Job Creation

- Manufacturing
- Rural Economic Development
- Thermal Heating/Cooling
- Electricity
- Biofuels
- Mulch and Compost
- Shavings, posts and poles
- Lumber and SW Construction

$
Water Conservation

1994

252 gallons pcpd

2013

136 gallons pcpd

Santa Fe – 107 gallons pcpd
San Francisco -91 gallons pcpd
The Urban landscape has changed to conserve water…
The need to capture storm water run-off... enhance water quality and aquifer/ground water re-charge...

3500-5000 acre/feet per year
Avoid water consumption, or reduce using water conservation measures.

Reuse water within a single process or use harvested water for another purpose, without treatment.

Graywater
Rainwater (cisterns)
Site water quality
Use harvested water for another purpose, after treatment.

Treated Sewage
Industrial Water
“...companies that treat pressing water risks as a key strategic challenge will be far better positioned in the future. Companies that continue to ignore these challenges put themselves at higher risk.”

Authored by the Pacific Institute
Jason Morrison, Mari Morikawa, Michael Murphy, Peter Schulte
February 2009 A Ceres Report
Adapt…How the west was developed...

• Cheap abundant easy to develop land...
• Cheap abundant supply of fossil fuels…
• **An infinite supply of water**…
• Energy production had no global impact…
• SOV meant you could live a long way from where you work…(VMT)
• What is Climate Change?
The Albuquerque Story…

“Employment Centers”

- Old Town
- Downtown & Railroad
- Kirtland AFB
- UNM/UNMH/CNM
- Sandia NL
- Uptown & I-40
- Rio Rancho & Intel
- North I-25 & Journal Centerr
Density < Land
Density < Land
Density
Is not a four letter word!
Density < Land
Density < Water
Density < Energy
Higher Density Mixed-Use development...drives transit...reduces VMT...reduces GHG...reduces impervious surface...reduces landscape area per unit...reduces fixture counts per unit...uses less water
Density < Land

201 Units @ 1.7 = 344 people
137 Units @ 2.5 = 344 people
Water Use:
Average per unit use

Multi-Family = 126 Gallons per Day
Single Family = 270 Gallons per Day

ABQ Uptown = 70 Gallons per Day

Density < Water

Data Source: ABCWUA
Density < Water
Density < Energy
Density < Land
Density < Transit
BRT/Innovation Corridor

- 5.25 miles
- 2 major urban centers
- 2 community activity centers
- 8 distinct neighborhoods
Adapt...

New Building Codes...
net zero...water conservation...mixed occupancy

New Land Use Development Codes ...
mixed use, live/work/play, in-fill developments...

Technology & Transportation ...
innovation...energy production and storage...lifestyles

Eco-system...
connected...regional planning...every drop counts...
we live in a desert
ABQ must adapt and change its urban and built environment to respond to a drier and hotter Future…

(Climate Change is real)
“Innovation is the ability to see change as an opportunity - not a threat”

Steve Jobs
Demand → Innovation Creativity R&D → Production Manufacturing Services → Entrepreneurs Business Formation → Economic Development
New Mexico’s Unique Opportunity

A global research & development initiative focused on all things “WATER”… utilizing the Rio Grande Watershed as the test bed for planning, research and new technologies…

UNM Center for Water and the Environment
NM has the opportunity to turn “water” into a global economic development competitive advantage…
Driver’s of Prosperity:

- Innovation
- Human Capital
- Infrastructure
- Quality of Place
Greatest earned media event in the history of man...
Finding a balance…
Manage & Protect
Conserve
Reuse & Recycle
Adapt

Every drop counts...