

Preparing for an Uncertain Future: Developing a Utah Water Strategy

Alan Matheson
Executive Director



UTAH DEPARTMENT *of*
**ENVIRONMENTAL
QUALITY**



Water



UTAH IS GROWING

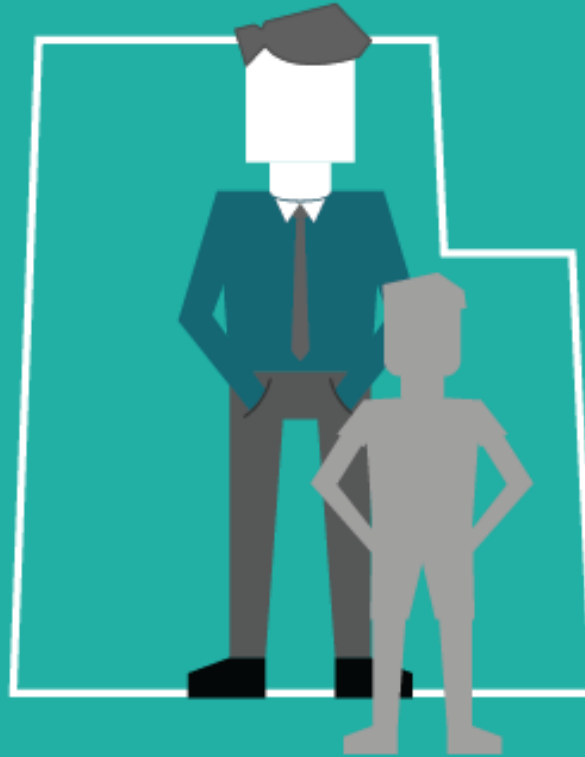
TODAY

*There are
3 million
people
living in
Utah*



2050

*By 2050 there will
be 5.4 million -
the population
will nearly
double in 35
years!*

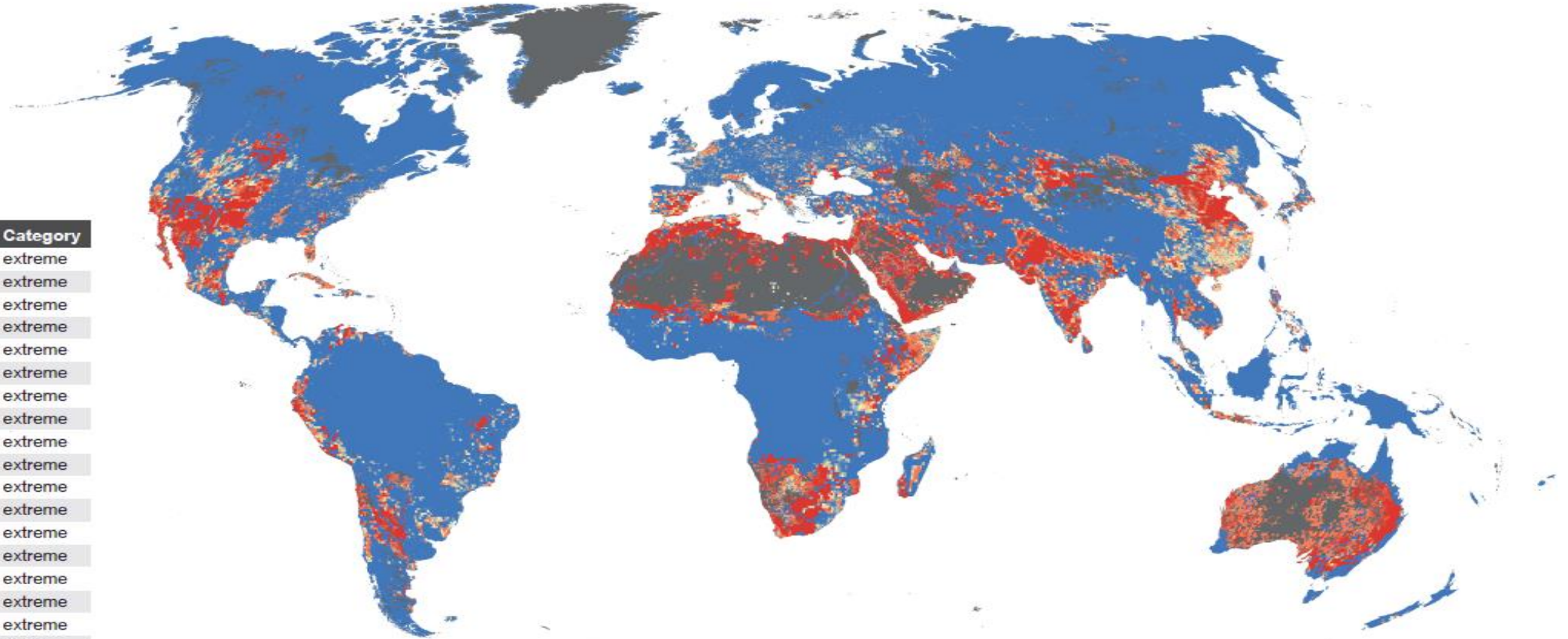


Utah's Water Challenges

- Utah is the second driest state
- Utah is among the fastest-growing states
- Changing Climate Conditions
- Interstate Water Competition
- Funding
- Deep political divide over water strategy

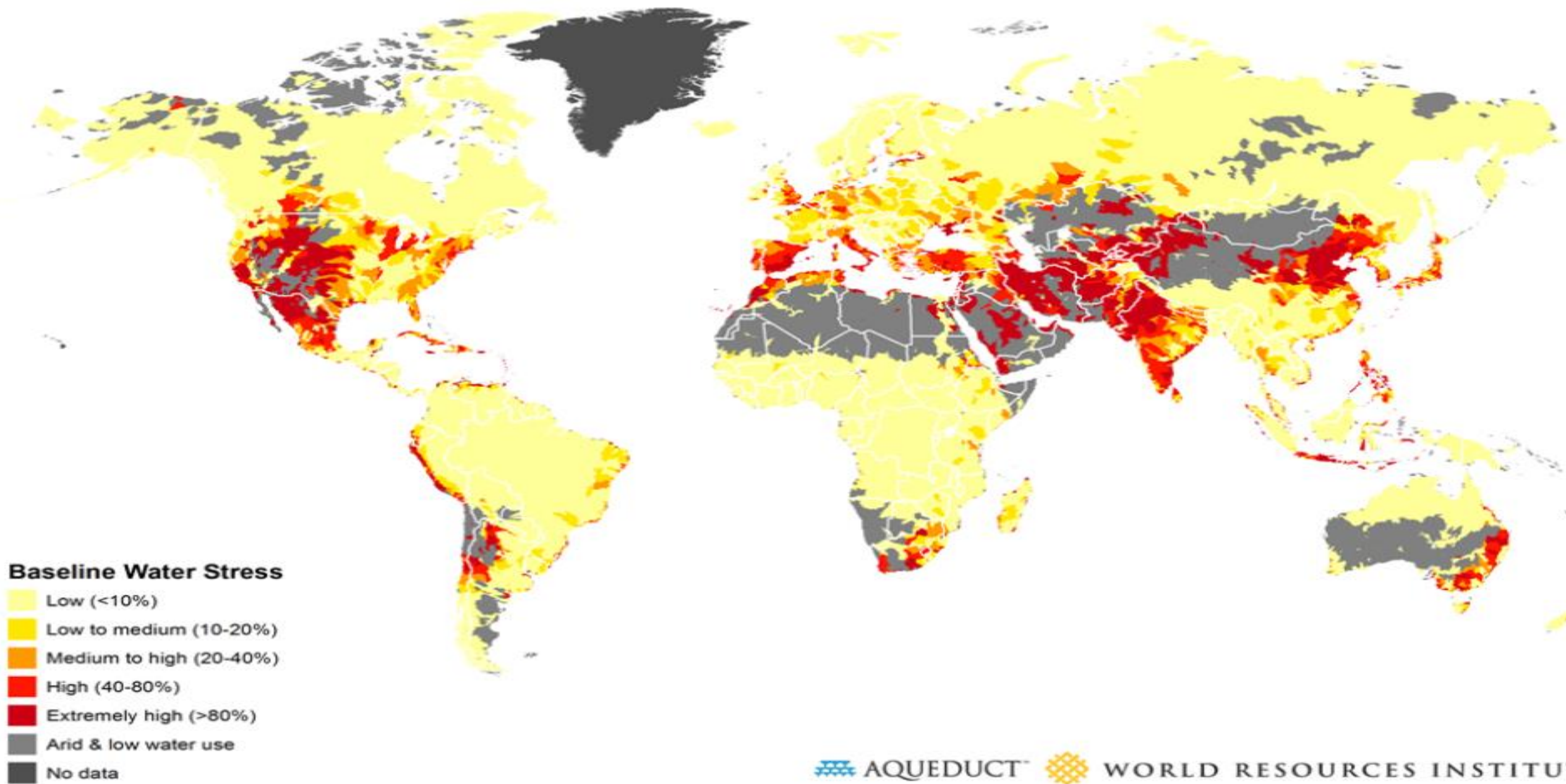
Water Stress Index 2011

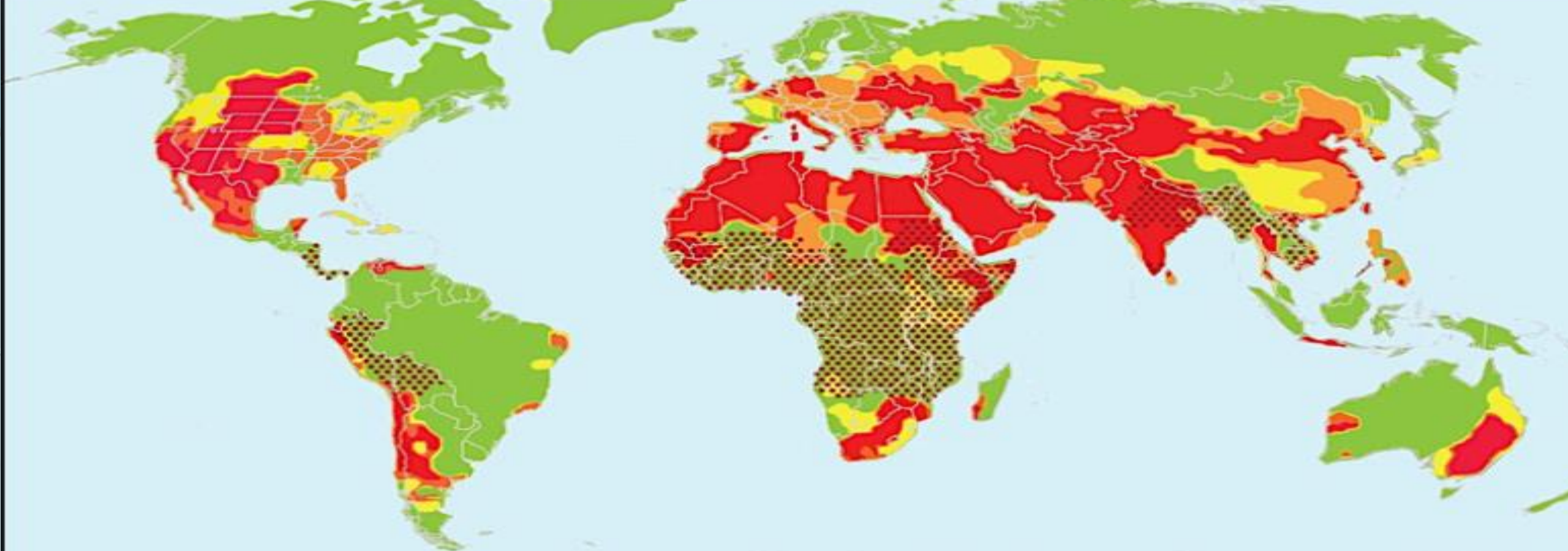
Extreme risk 
High risk 
Medium risk 
Low risk 
No Data 



Rank	Country	Category
1	Bahrain	extreme
2	Qatar	extreme
3	Kuwait	extreme
4	Saudi Arabia	extreme
5	Libya	extreme
6	Western Sahara	extreme
7	Yemen	extreme
8	Israel	extreme
9	Egypt	extreme
10	Djibouti	extreme
11	Jordan	extreme
12	Morocco	extreme
13	Algeria	extreme
14	Oman	extreme
15	Tunisia	extreme
16	Aruba	extreme
17	Malta	extreme
18	Syria	high
19	Mauritania	high
20	United Arab Emirates	high

WATER STRESS AROUND THE WORLD





-  No Water Stress
-  Low Water Stress
-  Moderate Water Stress
-  Severe Water Stress
-  Economic Water Stress (based on U.S. FAO, 2007)

Global Water Stress: 2030

(Based on *OECD Environmental Outlook*, 2008)





“In Utah, we don’t believe in sitting back and seeing where growth will take us. We seek to be visionary and to actively secure our future. Together, we will develop a voluntary, locally-implemented, market-driven vision to help keep Utah beautiful, prosperous, healthy and neighborly for current residents and future generations.”

Governor Gary R. Herbert,
honorary co-chair of Envision Utah
October 29, 2013



Your Utah Your Future



HOW TO CREATE A VISION: THE PROCESS



11 TOPICS

Utahns' values guided the selection of 11 topics critical to the future of Utah.



UTAHNS' VALUES

Values studies told us not just what Utahns care about, but why they care about those things.



ACTION TEAMS

Experts from across the state studied the topics and helped shape potential scenarios for the future.

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·
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SCENARIOS



8 ACTION TEAMS

OF 400 EXPERTS WORKED FOR 18 MONTHS TO DEVELOP POTENTIAL SCENARIOS FOR UTAH'S GROWTH ACROSS EACH TOPIC.

· · · · ·

THE SURVEY



53,000 UTAHNS

WEIGHED IN ON EACH TOPIC AND
EACH SCENARIO, TELLING US
WHAT THEY WANT UTAH TO
LOOK LIKE IN 2050.

THE VISION



A COMBINATION

OF SURVEY RESULTS, VALUES,
AND ACTION TEAM INPUT
FORMED A VISION FOR
UTAH'S FUTURE.

WATER



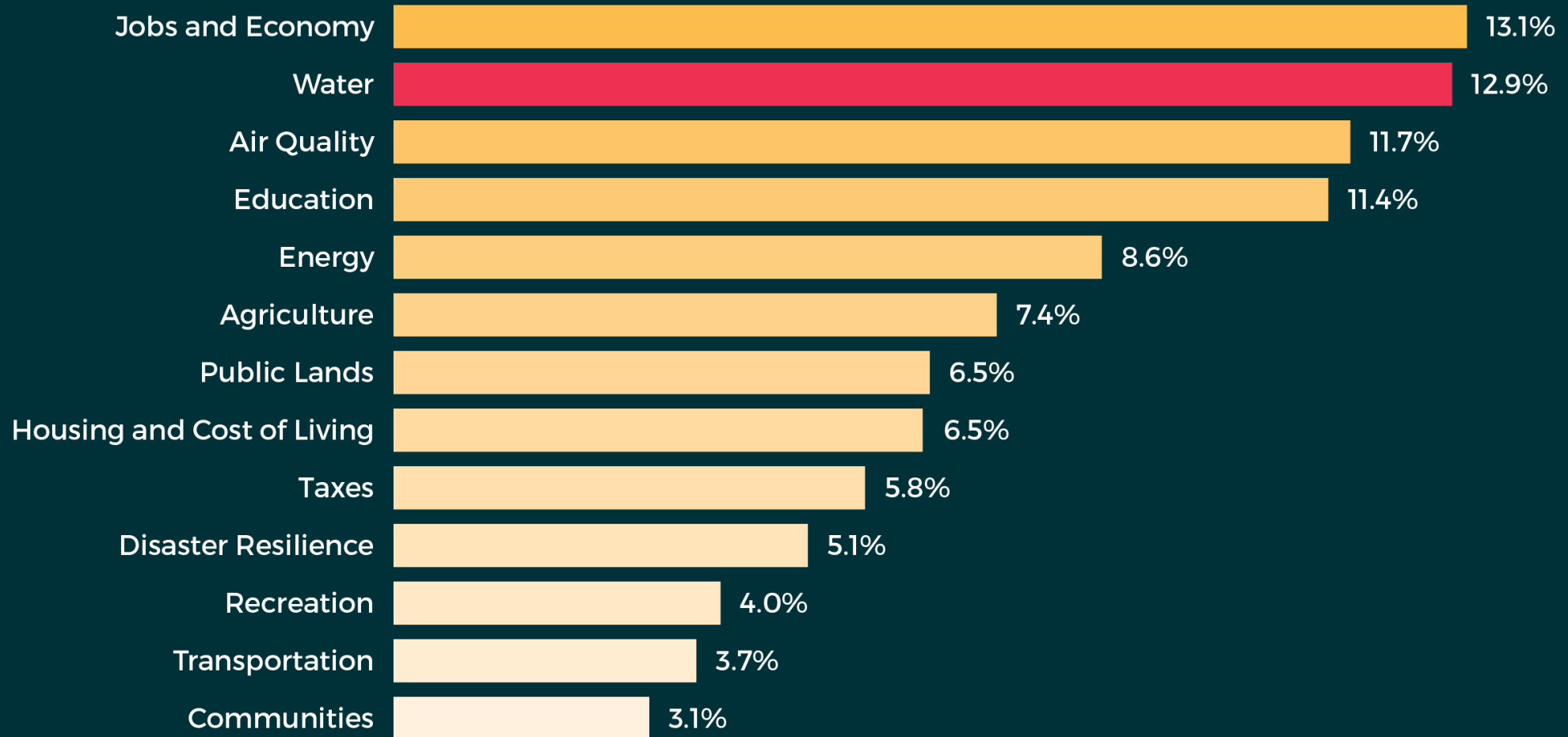
Governor's Request

- Year 1: Town Hall Meetings
 - Gang of 6
 - 8 town hall meetings
 - 800 online comments received
 - Summarized in white papers

Governor's Request

- Year 2: Water Strategy Advisory Team
 - Objective: Develop 50-year water plan
 - Solicited and evaluated potential water management strategies
 - Provided framework for public feedback
 - Developed set of strategies and ideas from broad input
- Your Utah, Your Future Process

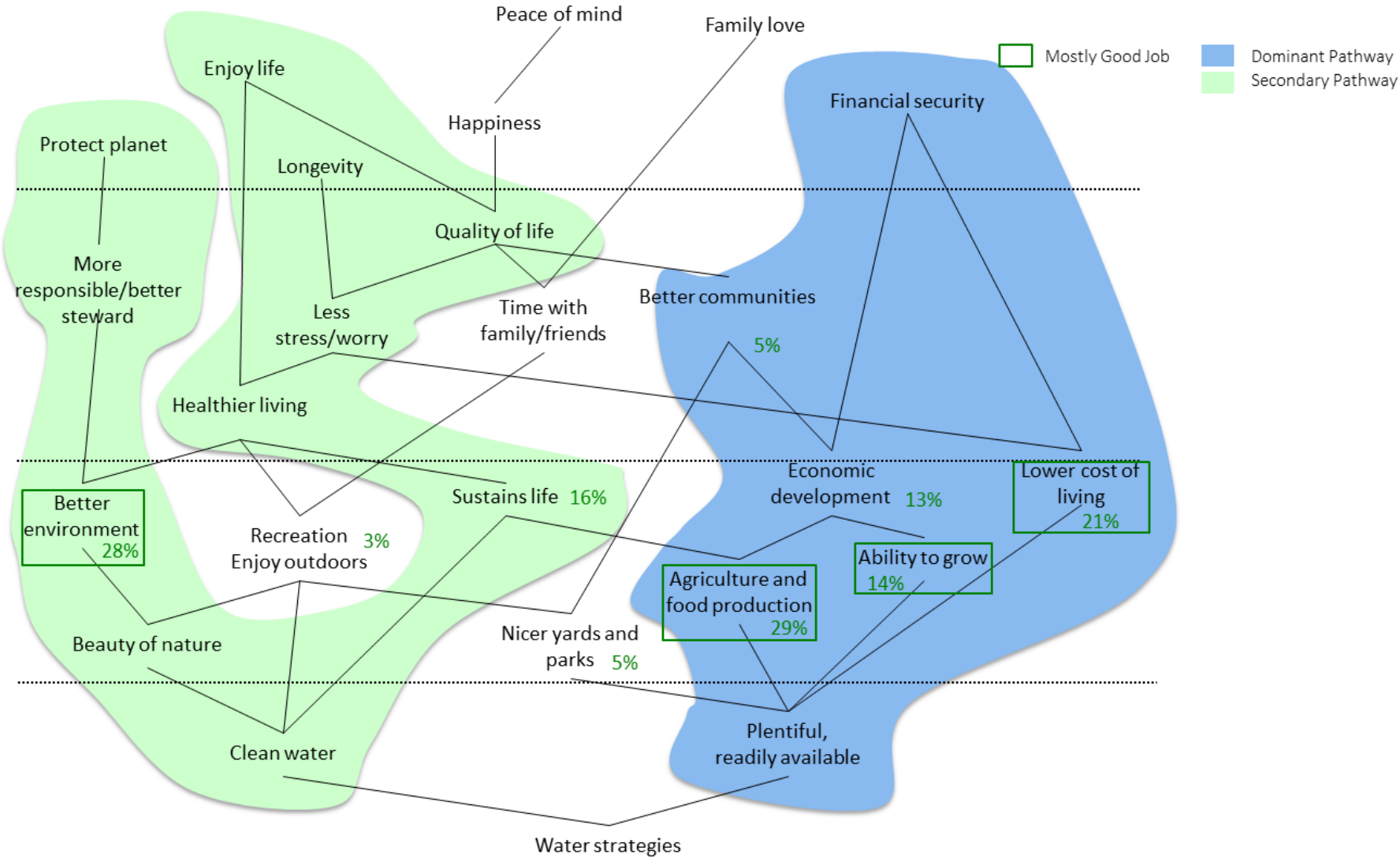
LEVEL OF CONCERN FOR THE FUTURE



The survey asked Utahns to weight the topics based on their importance in light of Utah's population growth. This resulted in a share of 100 points being allocated to each topic according to the average level of concern for that topic.

Water Value Pathways

- Personal Values
- Psychosocial Consequences
- Functional Consequences
- Attributes

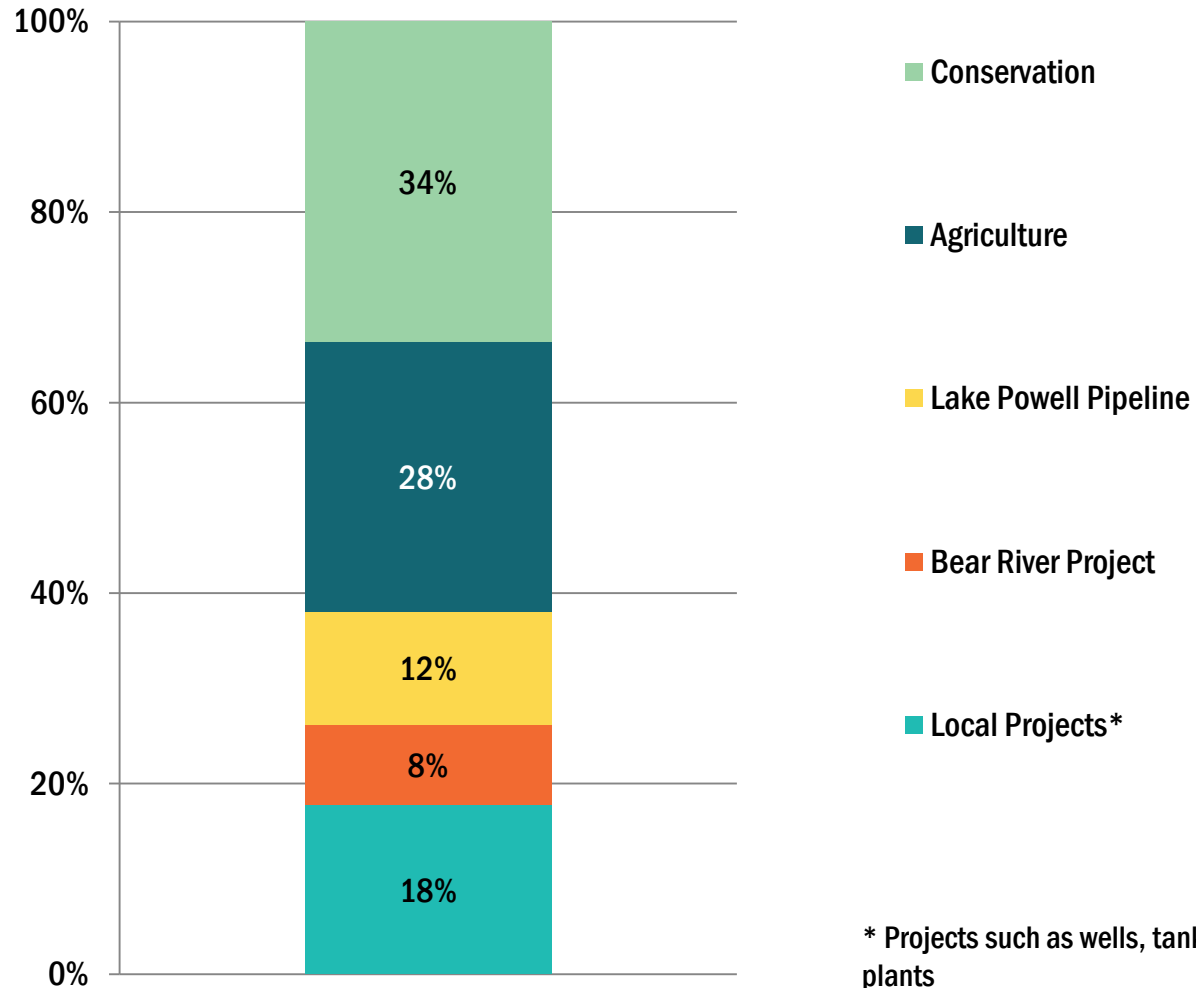


Utahns want plentiful, readily available, and affordable water for food production, community growth, and economic development. They also want clean water to support nature and be good stewards of the environment.

Assumptions for All Scenarios

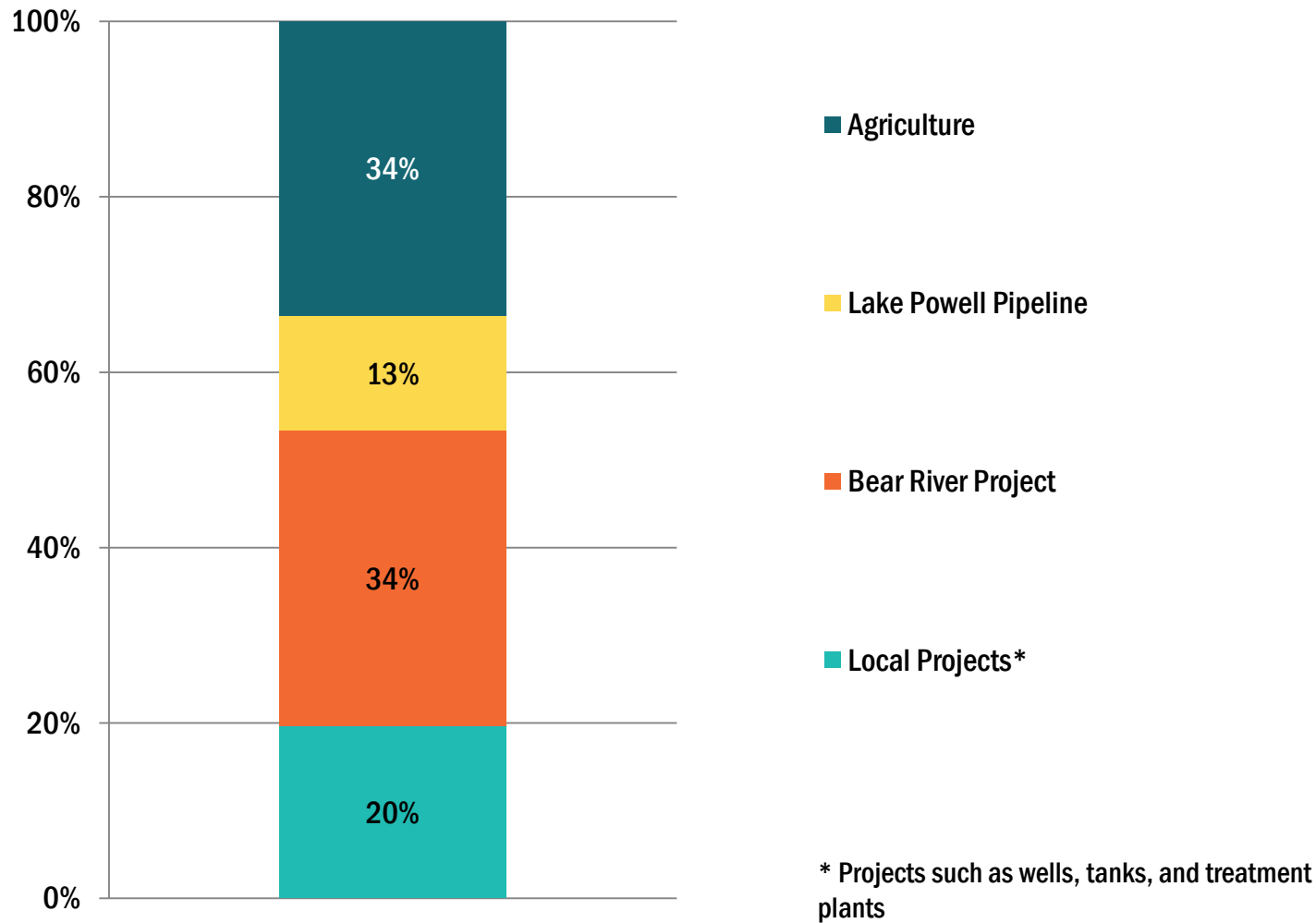
- Each scenario presented to the public assumes that we will develop adequate supply for the next generation
- Sego Lily is the lone exception; projections indicate southwest Utah will run out of water by around 2045 under this scenario even if all of the agricultural water in Kane and Washington Counties are moved to urban uses
- Each scenario assumes the same regional population growth trends

Allosaurus Scenario



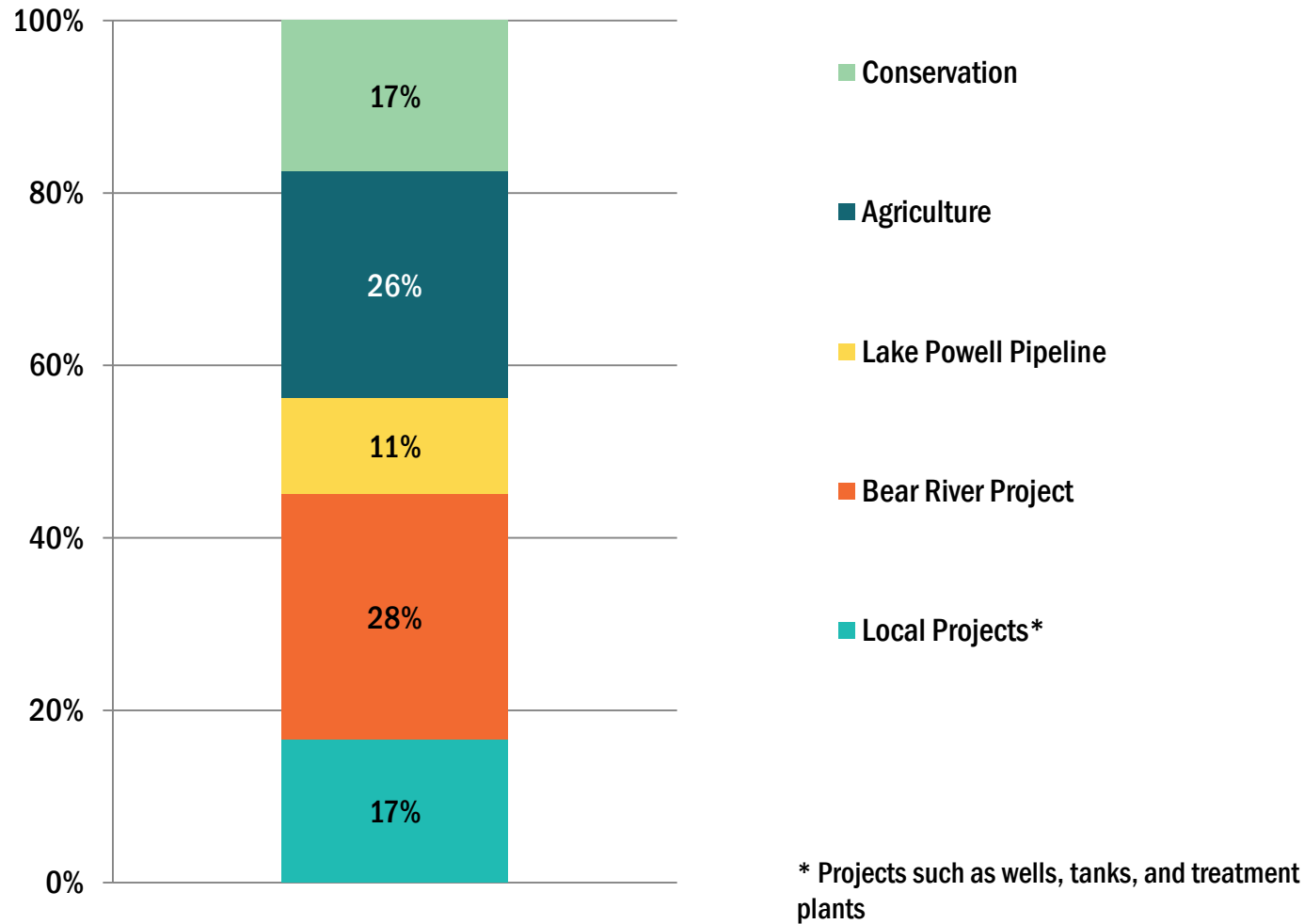
- Water **use 25% less than today** per person in homes, businesses, parks, etc.
- Maximum **30% of landscaping is grass**
- To supply water to our growing population:
 - We build local water projects (wells, tanks, treatment plants, pipelines, efficiency improvements, etc.).
 - We also **build** both the **Lake Powell Pipeline** to serve southwestern Utah, and the **Bear River Project** to serve the Wasatch Front. All or portions of the **Bear River Project may be delayed** until closer to 2050, though the Lake Powell Pipeline may still be required in the near term.
 - A significant amount of our **water also comes from agricultural lands** that are replaced by homes and businesses as our communities grow and by purchasing more water from working farms, **putting those farms out of production**.

Bonneville Trout Scenario



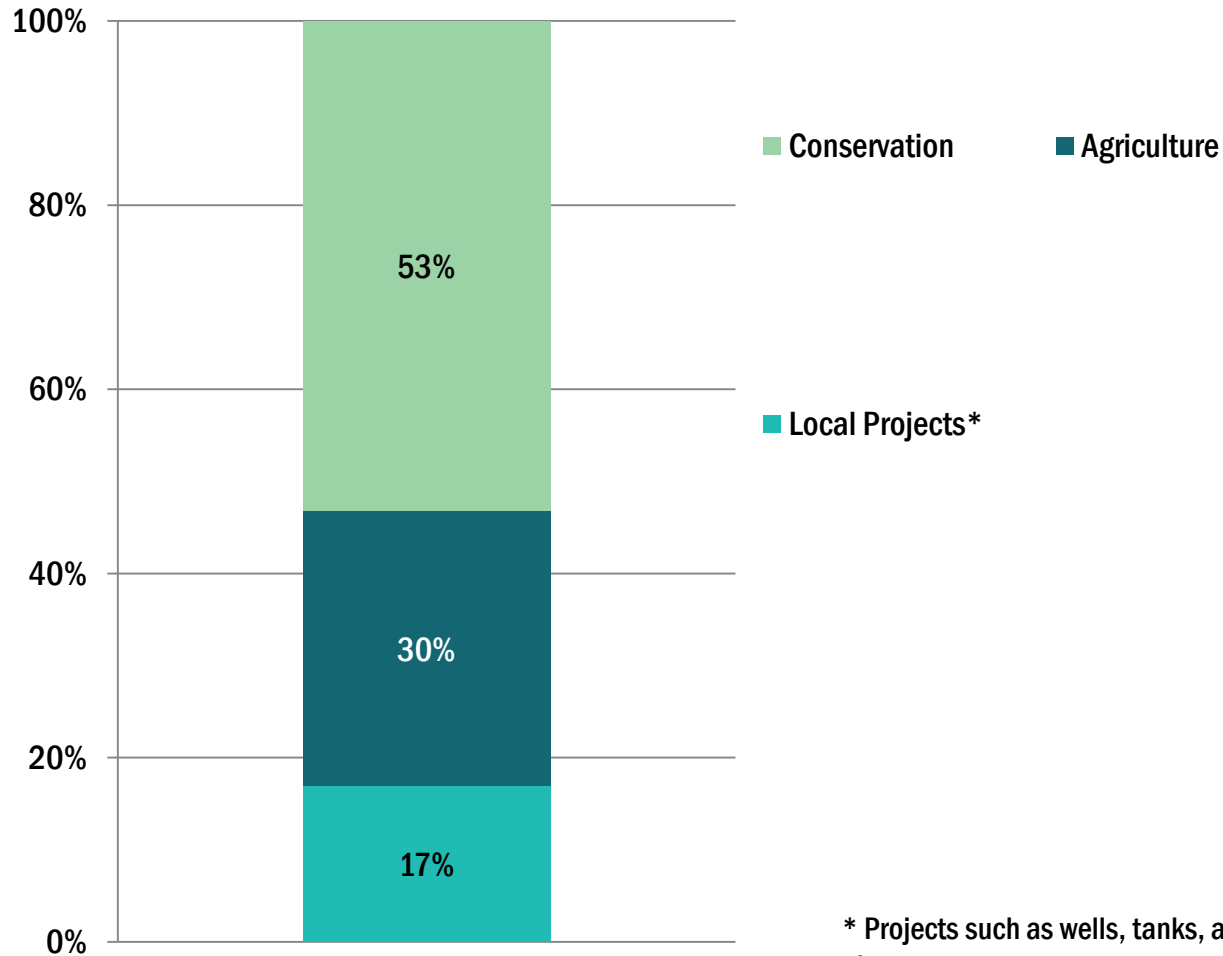
- Water **use** per person **same as today** in homes, businesses, parks, etc.
- Our **landscaping looks same as today**
- To supply water to our growing population:
 - We build local water projects (wells, tanks, treatment plants, pipelines, efficiency improvements, etc.).
 - In the near term, we also **build** both the **Lake Powell Pipeline** to serve southwestern Utah and the **Bear River Project** to serve the Wasatch Front.
 - A significant amount of our **water also comes from agricultural lands** that are replaced by homes and businesses as our communities grow.

Seagull Scenario



- Water **use 15% less than today** per person in homes, businesses, parks, etc.
- Maximum **50% of landscaping is grass**
- To supply water to our growing population:
 - We build local water projects (wells, tanks, treatment plants, pipelines, efficiency improvements, etc.).
 - We also **build** the **Lake Powell Pipeline** to serve southwestern Utah and the **Bear River Project** to serve the Wasatch Front.
 - A significant amount of our **water also comes from agricultural lands** that are replaced by homes and businesses as our communities grow.

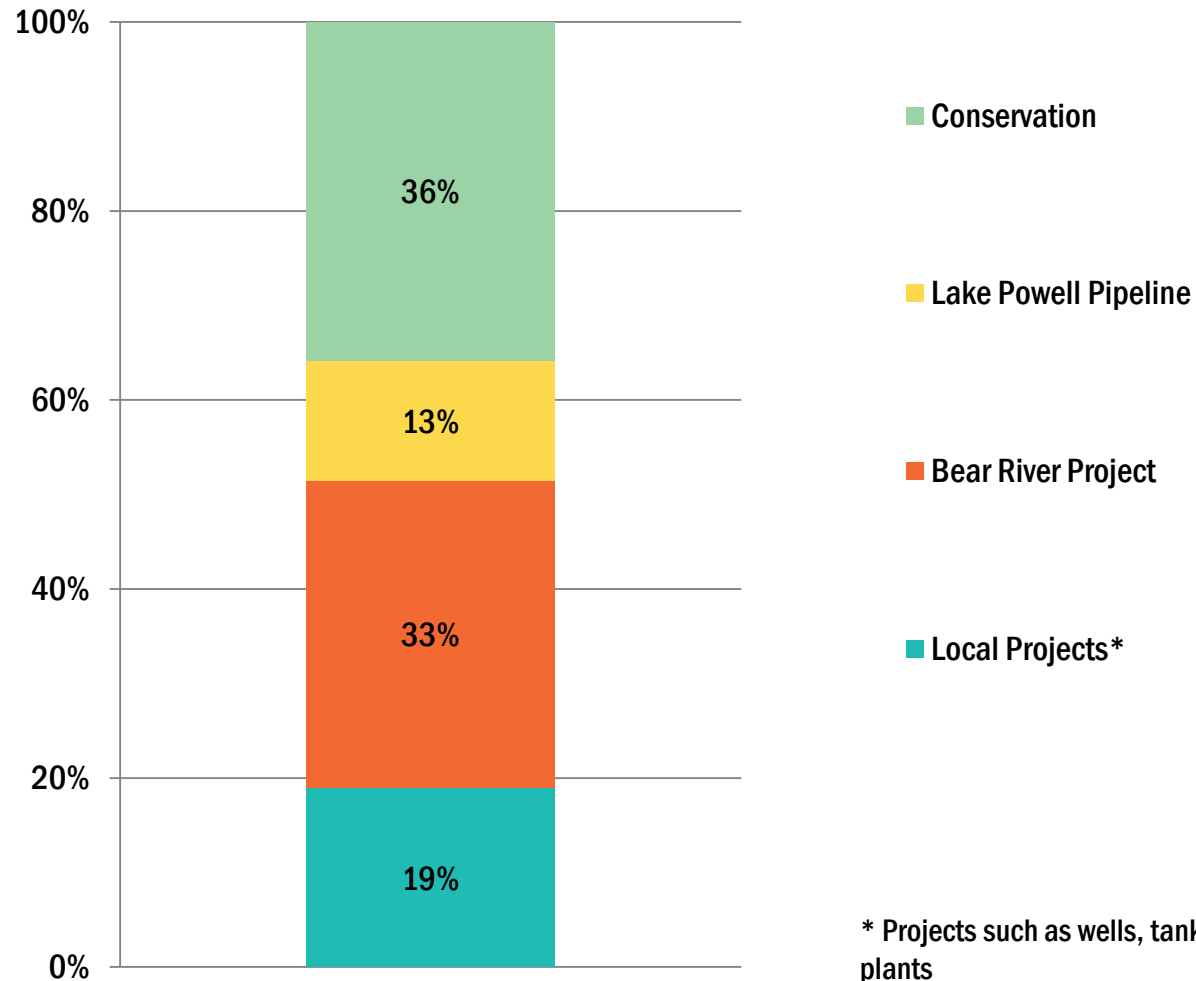
Sego Lily Scenario



* Projects such as wells, tanks, and treatment plants

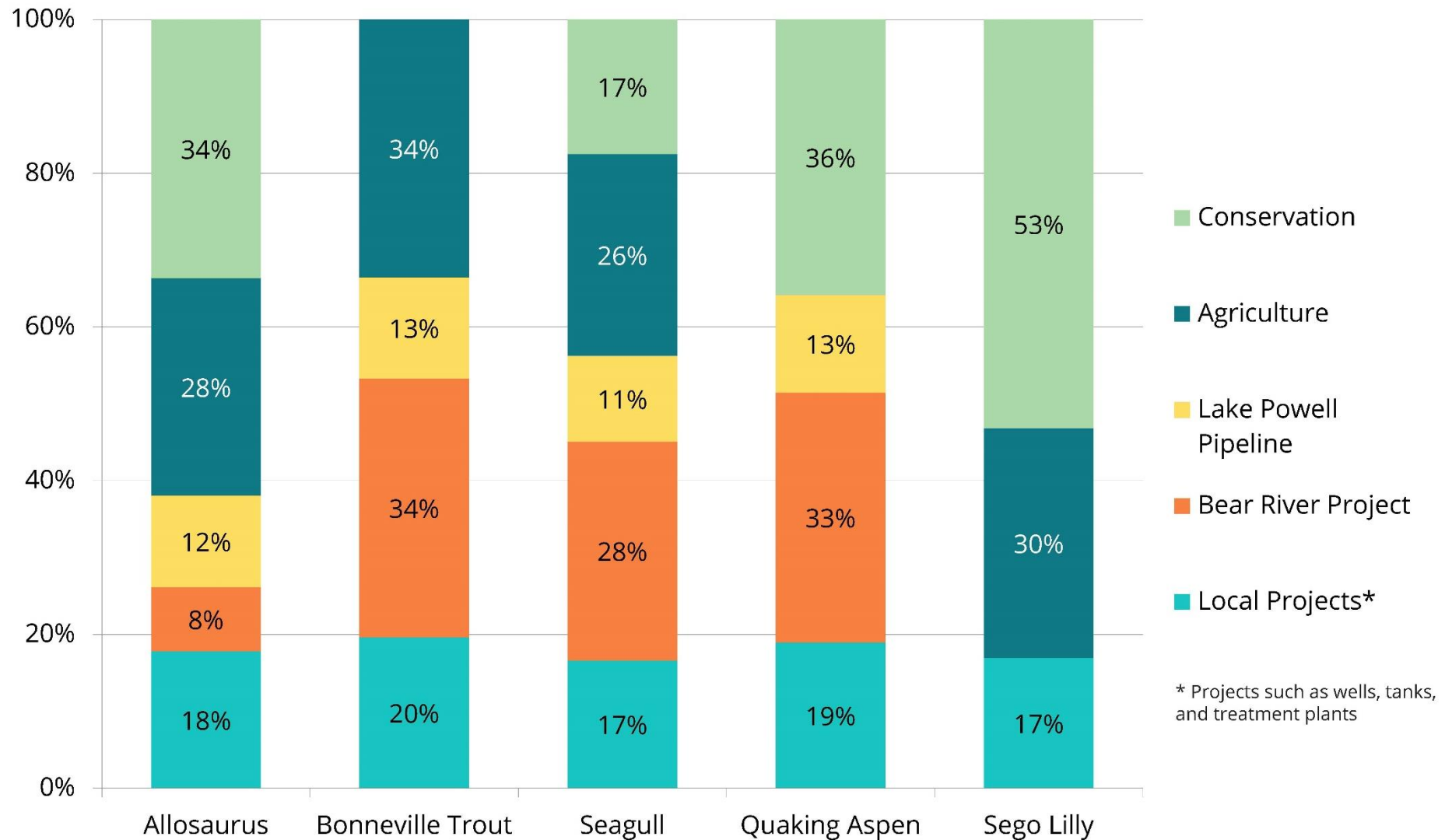
- Water **use 40% less than today** per person in homes, businesses, parks, etc.
- Almost **no grass in landscaping**
- To supply water to our growing population:
 - We build local water projects (wells, tanks, treatment plants, pipelines, efficiency improvements, etc.).
 - We **do not** need to **build the Bear River Project** to serve the Wasatch Front **before 2050**.
 - We **do not build the Lake Powell Pipeline**, meaning that **southwestern Utah may not have sufficient water supply** beyond 2045 even as water is taken from all the farms in the area.
 - A significant amount of our **water comes from agricultural lands** that are replaced by homes and businesses as our communities grow. We also buy more water from working farms, **putting those farms out of production**.

Quaking Aspen Scenario



- Water **use 25% less than today** per person in homes, businesses, parks, etc.
- Maximum **30% of landscaping is grass**
- To supply water to our growing population:
 - We build local water projects (wells, tanks, treatment plants, pipelines, efficiency improvements, etc.).
 - We also **build** both the **Lake Powell Pipeline** to serve southwestern Utah and the **Bear River Project** to serve the Wasatch Front. All or portions of the Bear River Project may be delayed for a decade or more, though the Lake Powell Pipeline may still be required in the near term.
 - As homes and business replace agricultural lands, the **water from** those **farms** is **moved to other farmlands**.

WHERE COULD OUR WATER COME FROM?

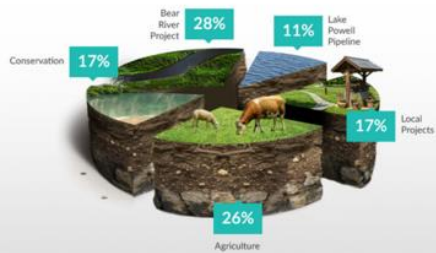


Change in Typical Landscapes



PUBLIC INPUT

☆ FAVORITE



SEAGULL
WATER

15% less use per person; new supply from projects & farms; max 50% grass in yards/parks

[More Information](#)

☆ FAVORITE

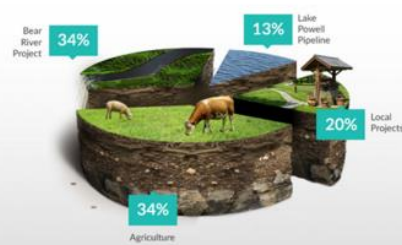


SEGO LILY
WATER

40% less use per person; new supply from local projects & farms; almost no grass in yards/parks.

[More Information](#)

☆ FAVORITE

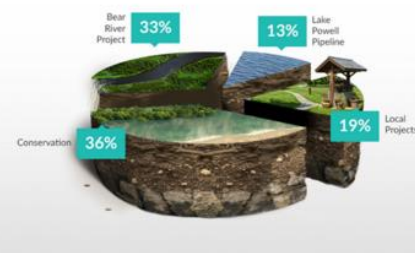


BONNEVILLE TROUT
WATER

Same use per person as today; new supply from projects & farms

[More Information](#)

☆ FAVORITE

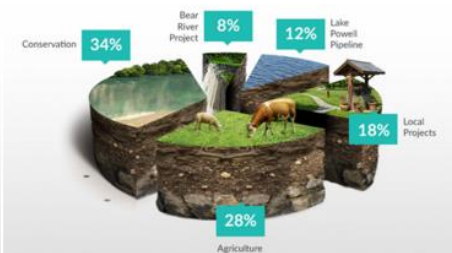


QUAKING ASPEN
WATER

25% less use per person; new supply from projects, little from farms; max 30% grass in yards/parks

[More Information](#)

☆ FAVORITE

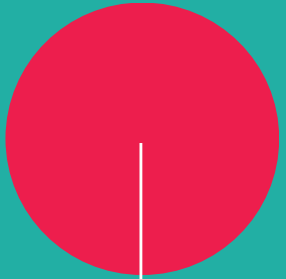


ALLOSAURUS
WATER

25% less use per person; new supply from projects & farms; max 30% grass in yards/parks

[More Information](#)

SURVEY RESULTS: SCENARIO CHOICES (WATER)



33%

25% less use per person; new supply from projects, little from farms; max 30% grass in yards/parks



24%

15% less use per person; new supply from projects and farms; max 50% grass in yards/parks



20%

40% less use per person; new supply from local projects and farms; almost no grass in yards/parks



13%

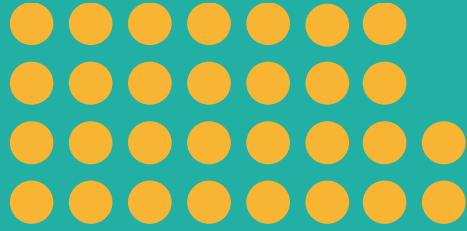
Same use per person as today; new supply from projects and farms



12%

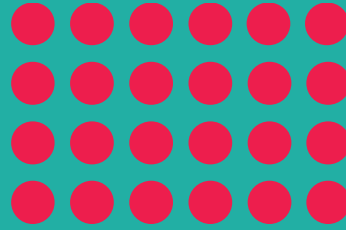
25% less use per person; new supply from projects and farms; max 30% grass in yards/parks

SURVEY RESULTS: IMPORTANT OUTCOMES (WATER)



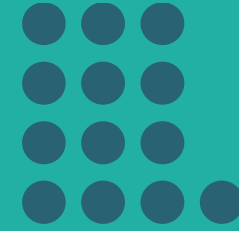
30%

Ensuring there's plenty
of water for farms and
food production



24%

Ensuring there's plenty of
water in our streams and
lakes for wildlife



13%

Ensuring there's plenty of
water in our streams and
lakes for recreation



12%

Limiting how much
we need to spend
maintaining our yards



10%

Minimizing how much
we need to spend on
water infrastructure



8%

Ensuring we have
sufficient grass and
other greenery



3%

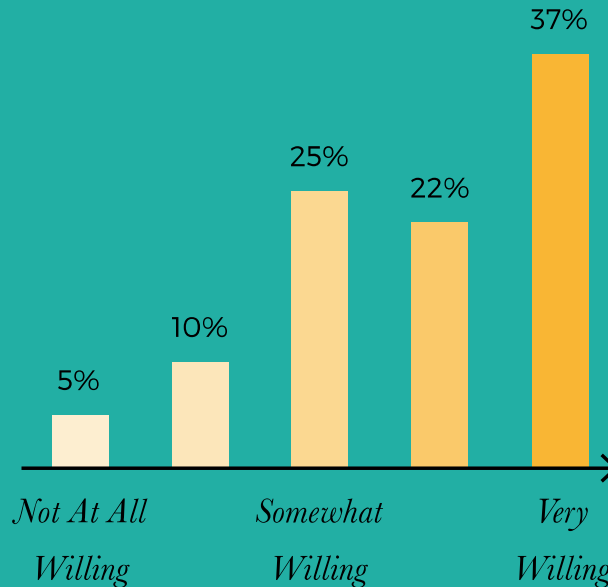
Ensuring we have
large yards

SURVEY RESULTS: WHAT UTAHNS ARE WILLING TO DO TO CONSERVE WATER

We will have to spend money on changing and maintaining our landscaping and irrigation systems (e.g., installing and maintaining drip irrigation systems).



In our yards, parks, and other landscaping, we will have less grass and other vegetation that uses a lot of water.

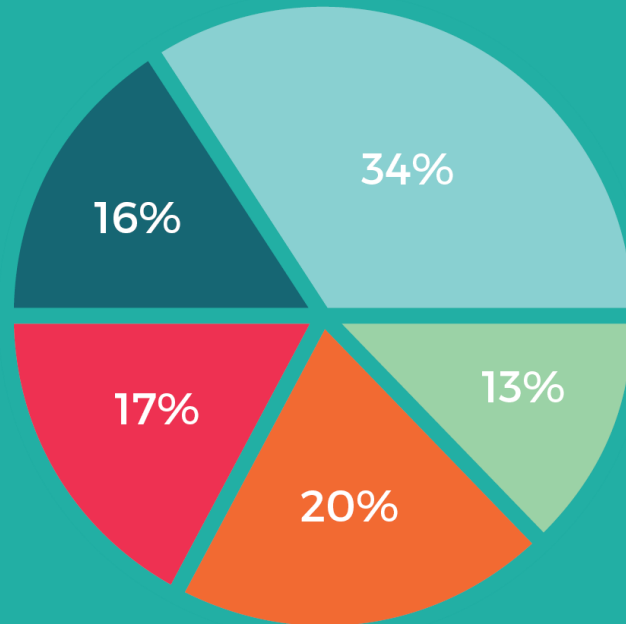


Our homes will need to have smaller yards.

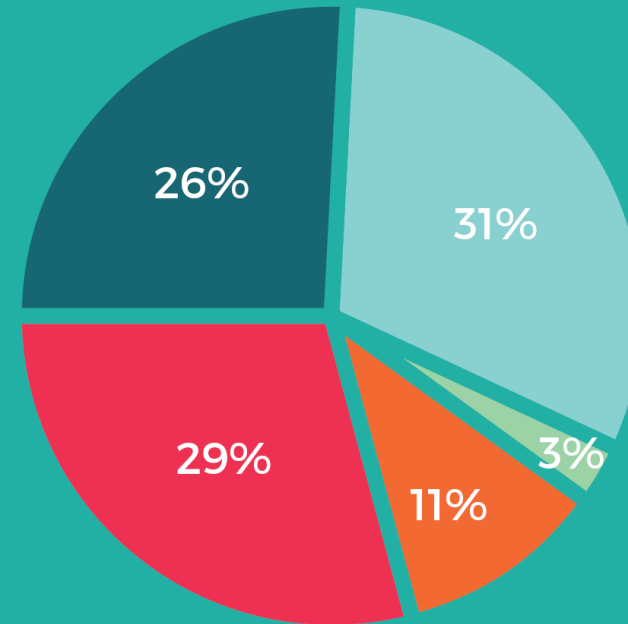


SUPPORT FOR LAKE POWELL PIPELINE

STATEWIDE



WASHINGTON
COUNTY



- Strongly agree to build
- Somewhat agree to build
- Neither agree nor oppose
- Somewhat oppose to build
- Strongly oppose to build

Avoid Planning Disconnects



WATER GOALS

1

Ensure future generations have sufficient water to sustain Utah's population and a strong economy.

2

Use less water per person.

3

Provide enough water for agriculture that allows farms to thrive and increases food production.

4

Ensure water in streams and lakes is sufficient to sustain wildlife and recreation.

5

Maintain and improve water quality in watersheds and water supplies.

6

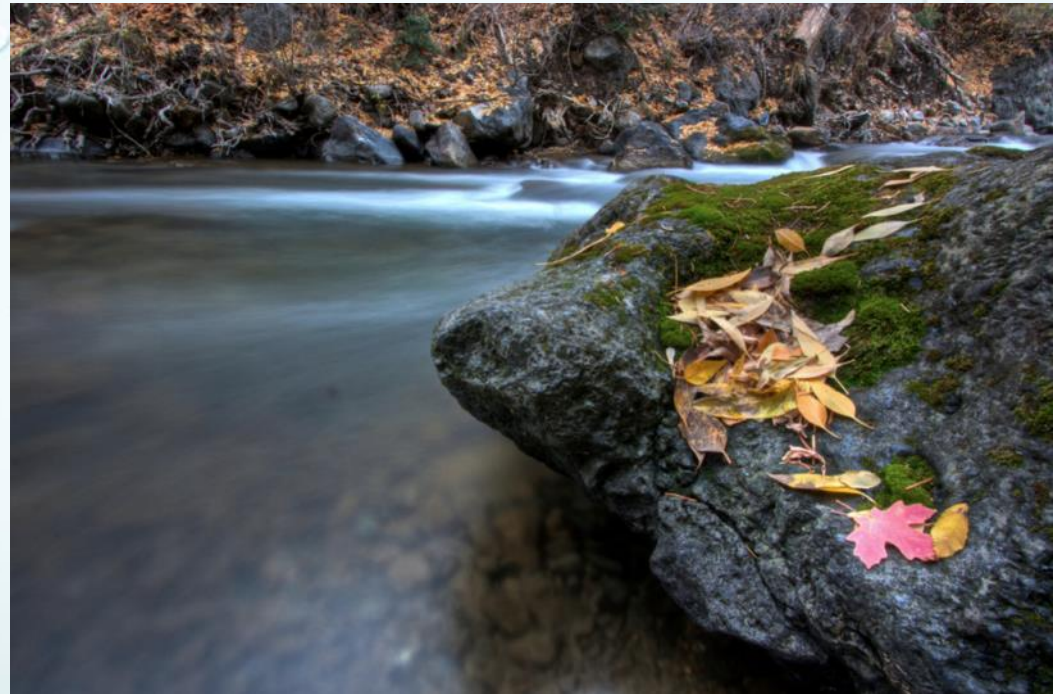
Balance the diverse needs for water.

WATER STRATEGIES

- Extend per-capita water use reduction goal to 35% by 2050.
 - Meet market demand for more houses on smaller lots, townhomes, apartments, etc.
 - Encourage water-wise practices.
 - Significantly reduce agricultural water conversion to urban uses.
 - Improve Utah's watersheds.
 - Maintain and replace existing water infrastructure.
 - Prepare for and develop new water supplies as needed.
- 
- The bottom of the slide features decorative wavy lines in two shades of teal, creating a water-like effect.

What should we do to preserve natural systems in the face of increasing water demands?

- Last in line
- Ecosystem needs
- Species protection
- Instream flows needs
- Funding for infrastructure



How will climate variations influence water allocation?

- Climate model uncertainty
- Impact of reduced snow pack on water resources
- How do we adapt?
- Preparatory costs – when do we invest?



What should we do to assure sufficient land and water for food production?

- **Conversion of ag to M&I**
- **Funding ag infrastructure improvements**
- **Real efficiencies**
- **Viable ag business enterprises**
- **Water pricing and the market**



How do we ensure water quality?

- *Same* resources managed by *different* agencies with *different* philosophies
- Detrimental impacts to water quality
- Coordination of efforts





Five Pillars of the Utah Nutrient Strategy

1. Adaptive Management
Technology Based Limits
2. Category 1 – Headwaters Criteria
Development
3. ACES Program & Funding for
Agriculture
4. Prioritization for Criteria
Development – Recovery
Potential
5. Optimization of Existing Facilities

2016 Utah Lake Harmful Algal Bloom



Utah's Abandoned Mine Discharges



Developing a Water Quality Strategy for Great Salt Lake

1. Numeric Water Quality Criteria
2. Wetlands
3. Strategic Monitoring and Research
4. Communication
5. Acquire the Necessary Resources to Implement the Strategy

What is Utah's role in conservation?



- High water use on landscape
- Inconsistent per capita data
- Social resistance to change
- Environmental impacts of conservation
- Budgetary impacts to municipalities and districts

How will we fund R&R of existing water infrastructure?

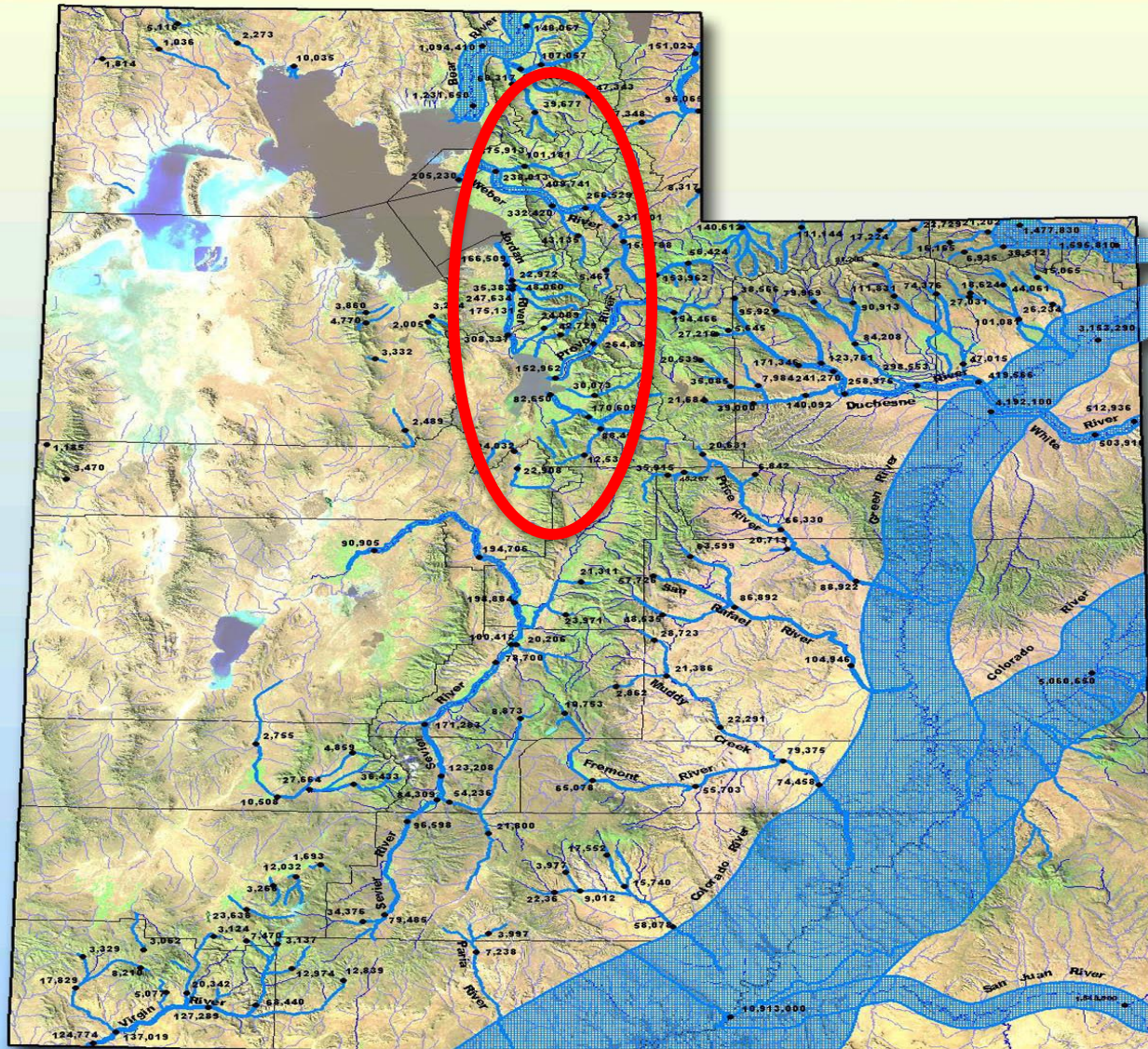
- Major infrastructure R&R needs
- Replacement costs
- Reduced federal participation
- Increased state participation



How will we plan and fund new water infrastructure?

- New water *development* needs
- New water *distribution* needs
- Growth limitations from insufficient infrastructure
- Water supplies for increased ag needs





**Where Utah's
Water Is**

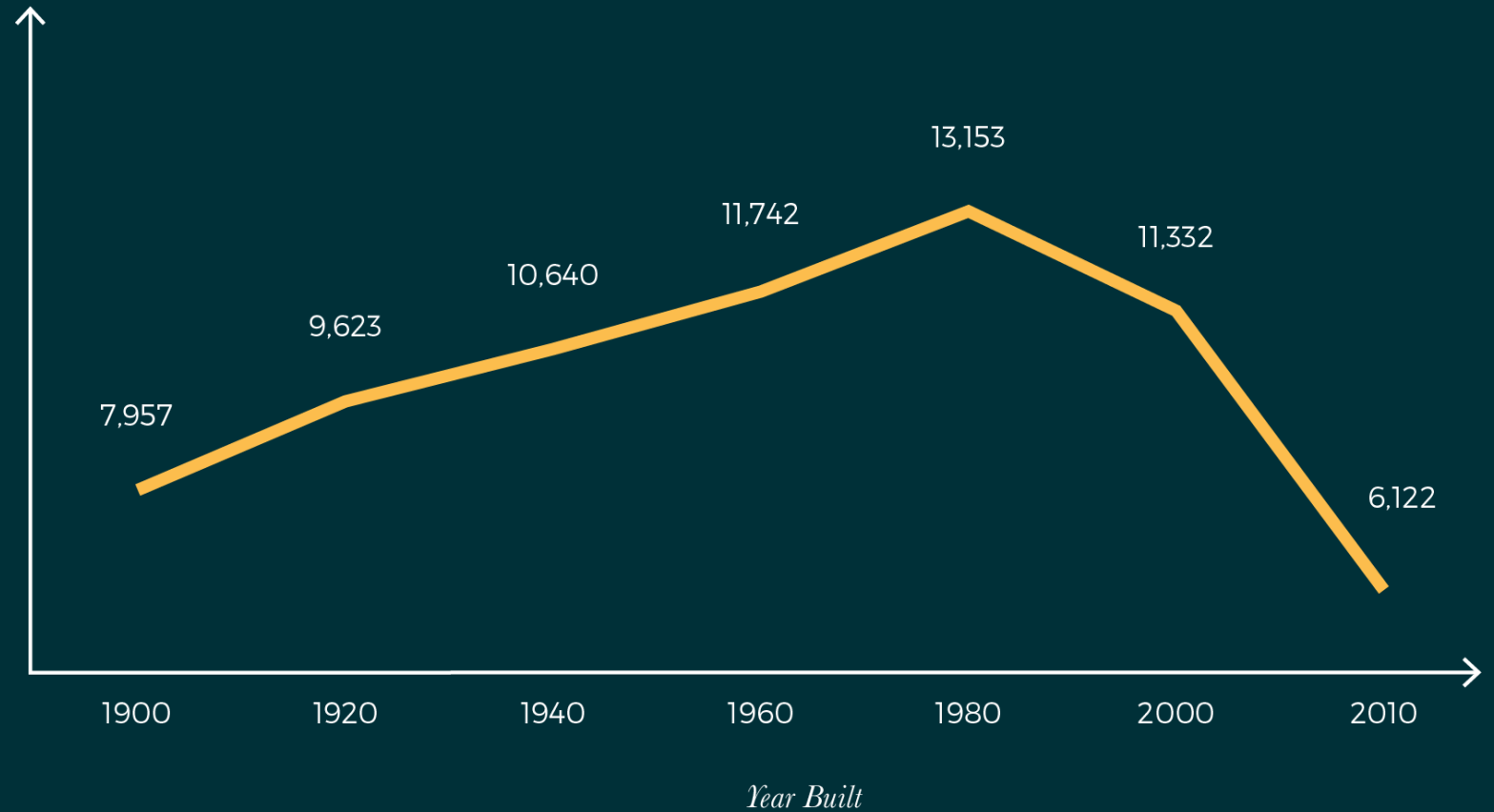
**Where Utah's
People Are**

An aerial photograph showing a suburban landscape. A river flows through the center, bordered by green fields and residential areas. In the foreground, there are houses, a large green field, and a river with a concrete-lined bank. In the background, there are more houses, a large red building, and a city skyline under a clear blue sky.

The Role of Urban Planning

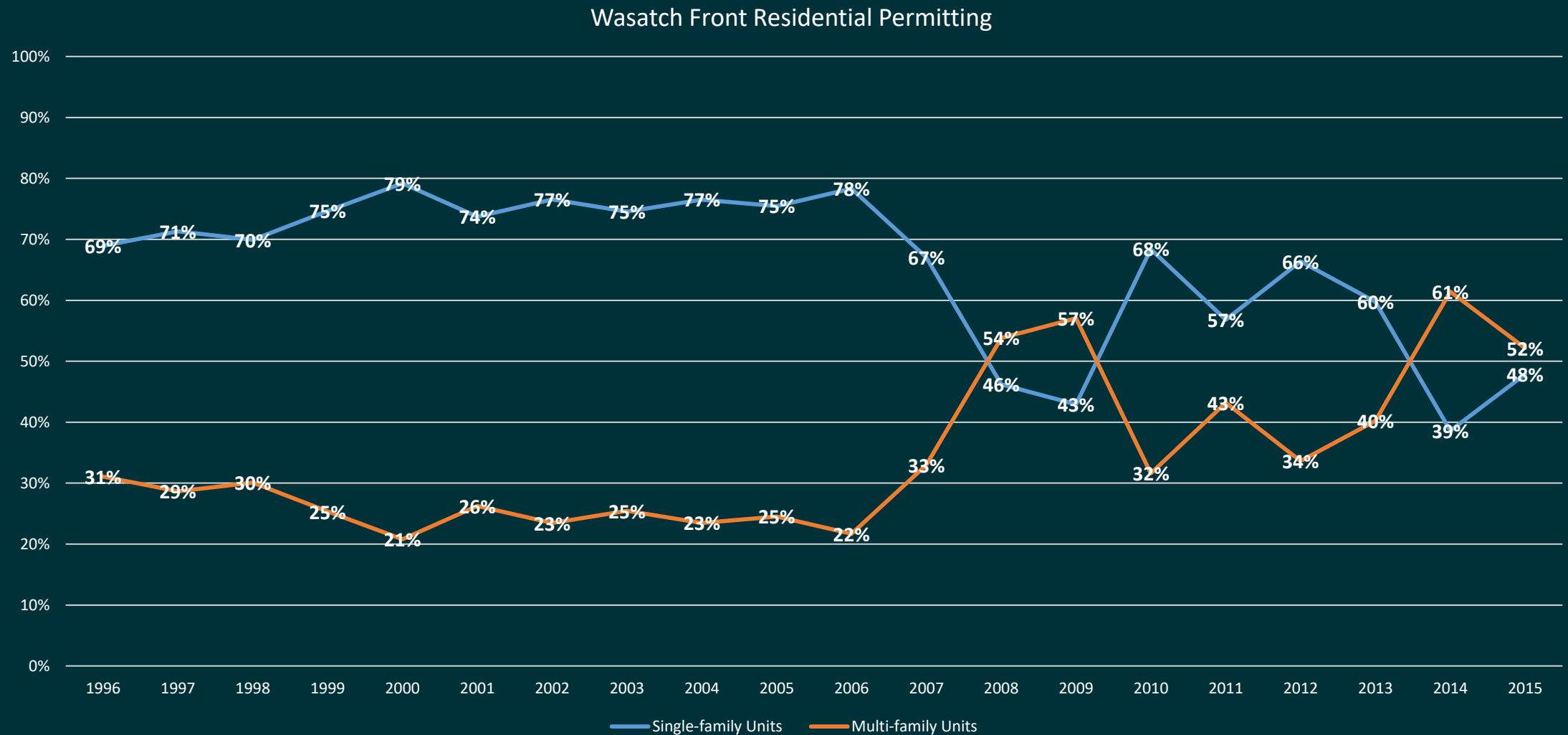
MIX OF HOUSING

Lots are getting
smaller across the
Wasatch Front



AVERAGE SINGLE-FAMILY LOT SIZE IN SALT LAKE COUNTY
(In Square Feet)

Permits for single-family units have declined while permits for multi-family units have increased.



Assumptions

- Utah's population will double by approximately 2060.
- Existing water infrastructure wearing out.
- Water is a finite and variable resource that is affected by climate.
- Utah values agriculture.
- Utah values a vibrant economy.
- Water quality is important.
- Utahns value water as part of the natural environment.
- Need will drive technology, which will drive change.
- Wise and efficient use of water will be necessary (conservation).
- The cost of water will continue to increase.

Key Policy Questions

How will we supply water to 5 million Utahns?

Issues

Municipal supply development and conveyance

Related large infrastructure

Repair and replacement of existing

Construction of new local

Methods

Water efficiency (conservation programs)

Conversion of agricultural supplies

Construction of new water supply projects

Large-scale funding mechanisms

Preservation of existing funding sources

Innovation

Funding mechanisms

Capital asset management plans

Innovation

Funding mechanisms

Innovation

This is what happens when you don't plan ahead



