# Report Summarizing Meetings of Experts Reviewing
# CWC Environmental Dashboard Elements

James Ehleringer
Phoebe McNeally
Susan Bush
University of Utah

and

Mary Pendergast
Wild Utah Project

November 12, 2019

A result of the Mountain Accord efforts several years ago was a request to have a dashboard developed that would provide information on various aspects of the environment. That resulted in an award to the Brendle Group (a consulting firm in Colorado) in 2016 to create such a dashboard. In the intervening years, the Brendle Group terminated their association, and in August of 2019, those duties were assigned to Phoebe McNeally, director of the DIGIT Lab at the University of Utah, and to James Ehleringer, an ecologist in the School of Biological Sciences at the University of Utah.

One of the first McNeally-Ehleringer Group tasks was to reconvene the outside experts that had initially advised the Brendle Group, since those experts had not met and had not been asked to review and approve any dashboard products since the inception of the project several years earlier. Through a series of five meetings between October 21-24, the McNeally-Ehleringer Group met with topic-specific experts

- to review documentation developed by the Brendle Group
- to revise and achieve group consensus of the most relevant ways to approach dashboard elements
- to identify and achieve group consensus regarding the best measures at the layer below an initial dashboard elements landing page.



Experts from municipal, county, state, and federal agencies, and from the University of Utah, met to discuss environmental dashboard elements between October 21-24, 2019.

This report summarizes those efforts, which after final review and input from the experts, will be the basis for moving forward with the development of the first-generation and online Central Wasatch Commission (CWC) environmental dashboard.

Developing an online dashboard comes with some very difficult challenges. Among the most difficult challenges is the need for an online, environmental dashboard to serve the needs of a very diverse community, ranging from the general public to topic-specific researchers, and from stakeholders to policy makers.
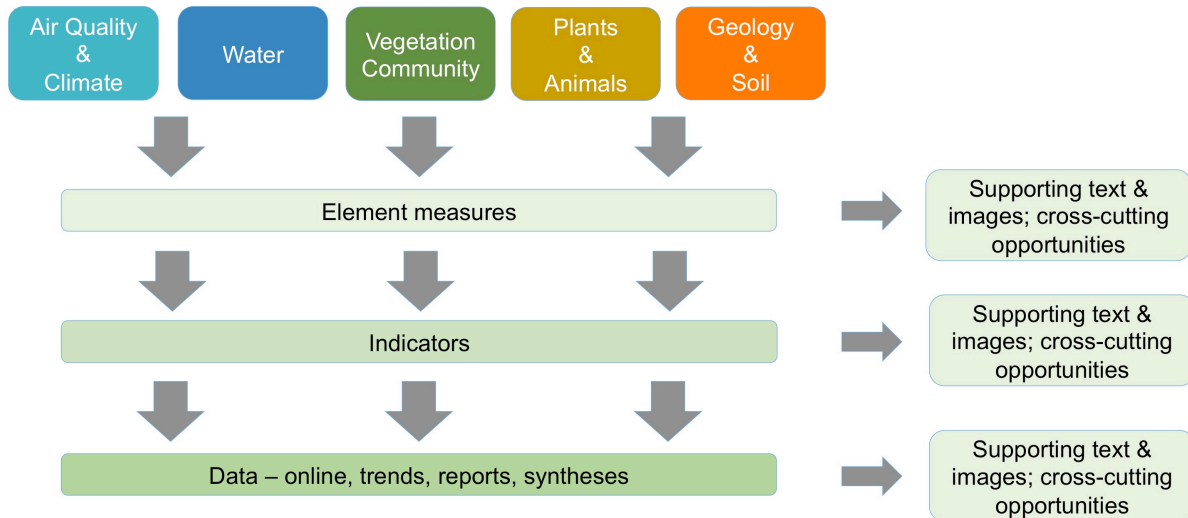
It is important to recognize from the outset of this process that fundamental and similar approaches emerged from each of the expert groups in their independent discussions. Each of the expert groups were uncomfortable with the approach initially taken in developing the dashboard. In its basic structure, the earlier Brendle Group dashboard approach could be described as a "score card" or "grade-based" approach, in which the environmental dashboard elements were also driven more by data availability than by concepts associated with any particular dashboard element (see Appendix A). The uniform consensus of each of the five expert groups was for an approach that was more information-based, providing information of use to as wide a spectrum of users as possible. Concepts that might relate to the status of a specific measure should appear as trends whenever possible, from which status changes could be subsequently presented.

In the initial Brendle Group dashboard structure, the landing page would have had five elements (Appendix A) that then led to a series of "targets", which had the implied suggestion that an element was or was not meeting a specific targeted value. That, in turn, would imply passing or failing. Uniformly, the experts thought this was not a wise approach, especially since it led to conclusions that might not be valid due to limited data availability for some "targets". Instead the experts suggested that the term "measures" should replace the concept of "targets". This re-orientation of the dashboard structure inherently implies development of a dashboard that is then meant to inform rather than to make judgments. Thus, the consensus was to build a dashboard that was information based, minimizing conclusions that might be misinterpreted.

In terms of environmental dashboard structure, five key landing page elements still persisted and were uniformly agreed upon by the experts. These five landing page elements are
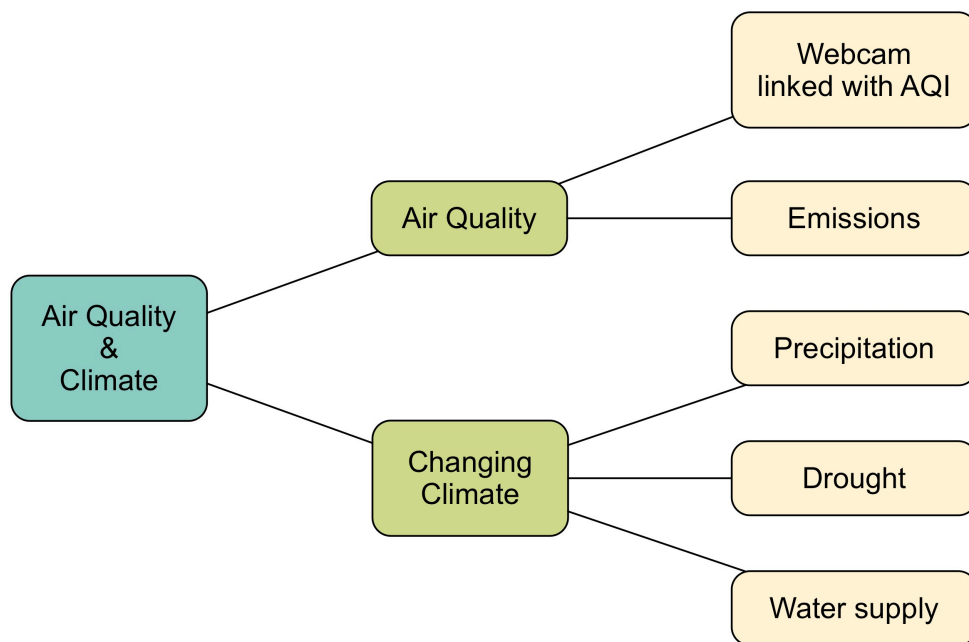- Air Quality and Climate
- Vegetation Community
- Geology and Soil
- Water
- Plants and Animals

## Currently Proposed Dashboard Elements

| Air Quality & Climate | Water | Vegetation Community | Plants & Animals | Geology & Soil |

Element measures → Supporting text & images; cross-cutting opportunities

Indicators → Supporting text & images; cross-cutting opportunities

Data – online, trends, reports, syntheses → Supporting text & images; cross-cutting opportunities

The proposed dashboard element structure as agreed upon by the experts at their meetings October 21-24, 2019.

In the graphics that follow, we provide a description of the dashboard element, followed by measures and sub-measures. These show the organizational structure for the proposed CWC environmental dashboard. In the next phase of this project, the data, syntheses, graphics, photographs, trend line information, and links to data sets will be developed and incorporated into navigable web pages. At this stage, we have now reached agreement and support from the experts to allow this project to move forward from a consensus-based foundation.
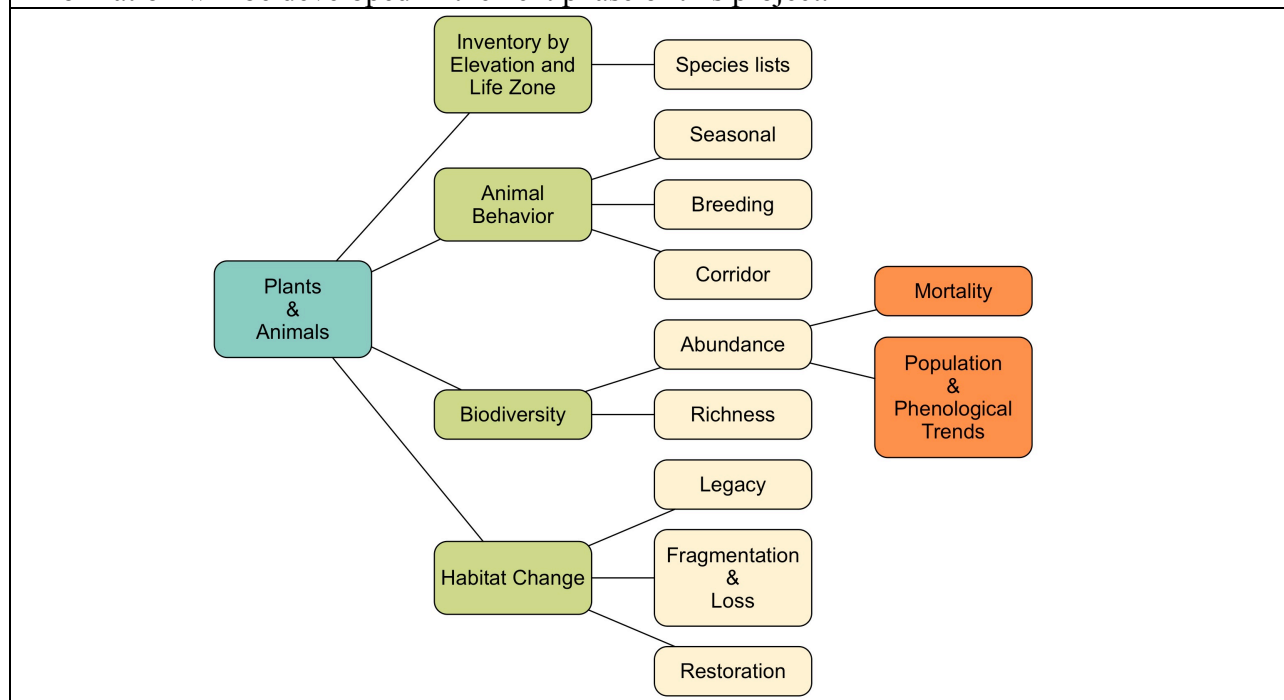
The environmental dashboard element "Air Quality and Climate" with its two measures and five sub-measures as agreed upon by the experts. Data, syntheses, trends, and additional information will be developed in the next phase of this project.
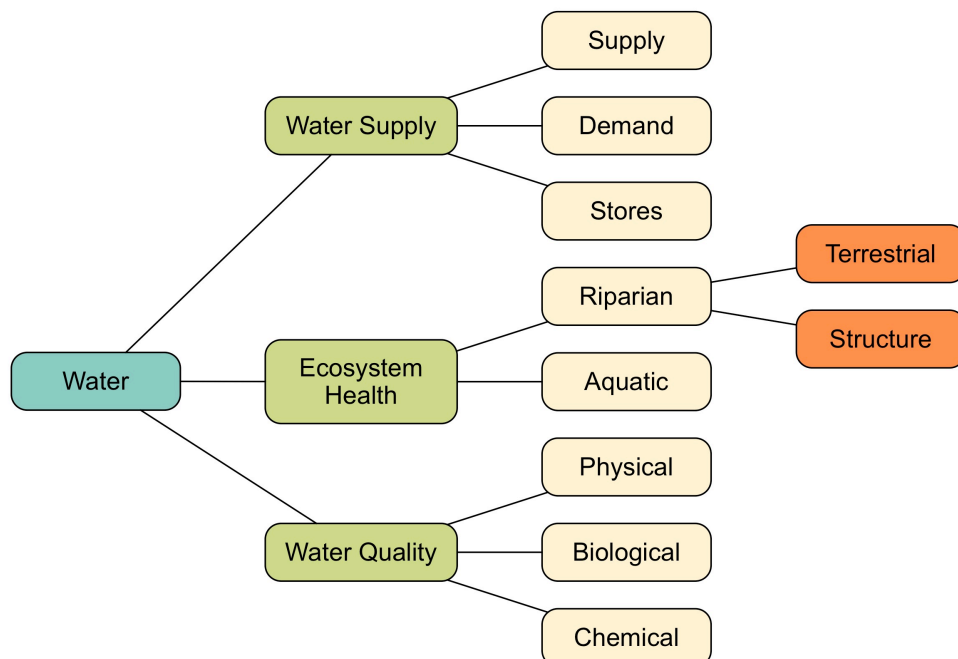


The environmental dashboard element "Water" with its three measures and eight sub-measures as agreed upon by the experts. Data, syntheses, trends, and additional information will be developed in the next phase of this project.
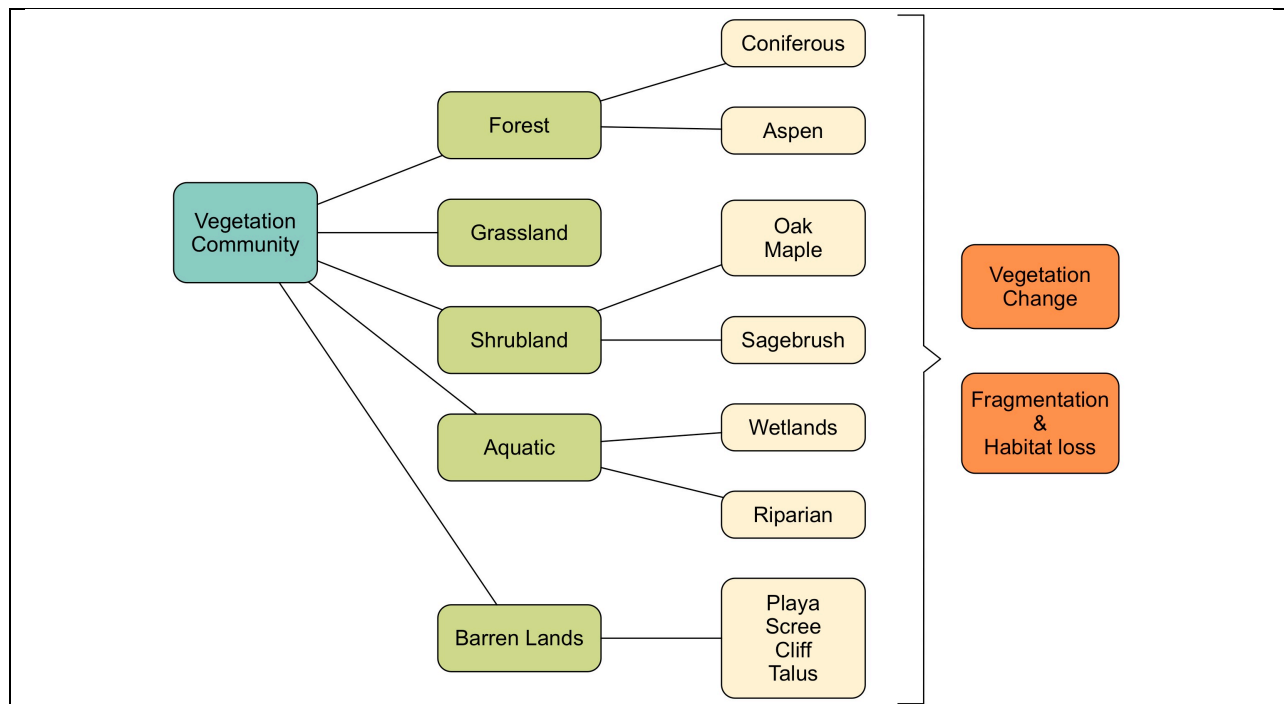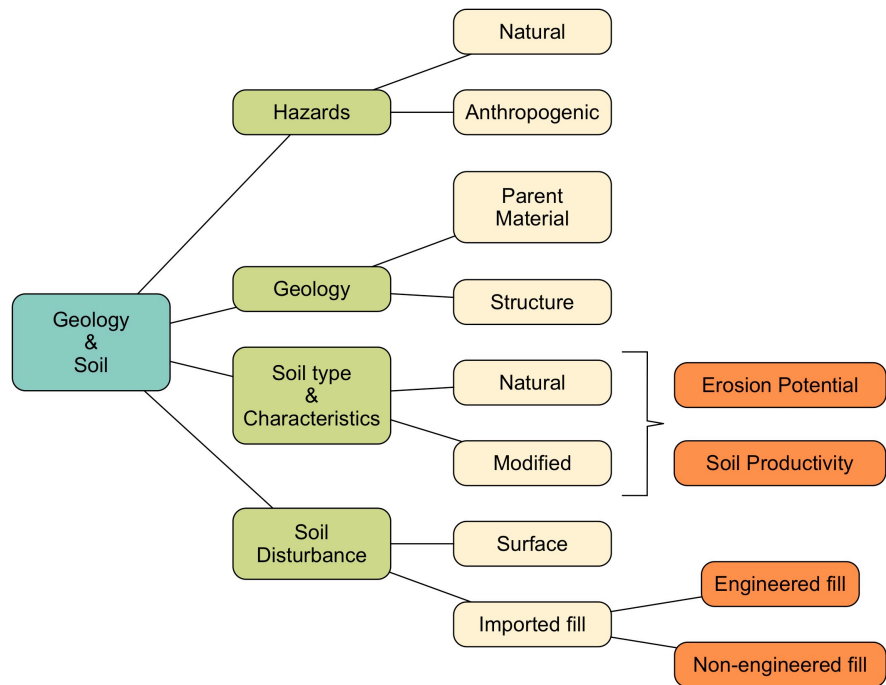
The environmental dashboard element "Vegetation Community" with its five measures and seven sub-measures as agreed upon by the experts. Data, syntheses, trends, and additional information will be developed in the next phase of this project.



The environmental dashboard element "Plants and Animals" with its four measures and nine sub-measures as agreed upon by the experts. Data, syntheses, trends, and additional information will be developed in the next phase of this project.

The environmental dashboard element "Geology and Soil" with its four measures and eight sub-measures as agreed upon by the experts. Data, syntheses, trends, and additional information will be developed in the next phase of this project.
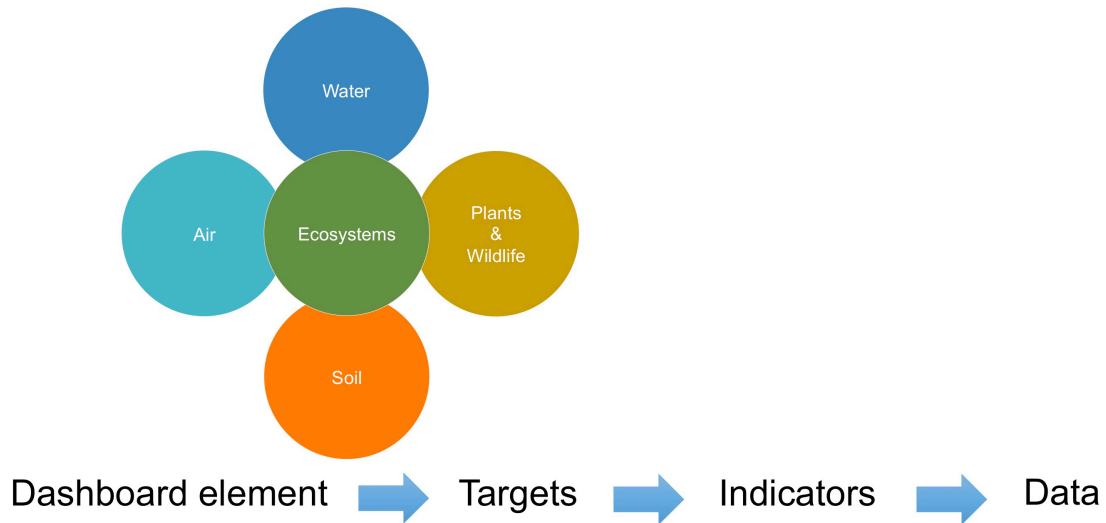
**Appendix A:** The dashboard elements developed initially by the Brendle Group.

## Historic Dashboard Elements



Water

Air   Ecosystems   Plants & Wildlife

Soil

Dashboard element ➡ Targets ➡ Indicators ➡ Data

The initial environmental dashboard landing page structure as proposed by the Brendle Group

---

## <u>Inherited</u>
## Air Targets & Indicators

Targets:
- Healthy air days
- Visibility
- Temperature

Indicators:
- Ground-level ozone
- Particulate matter 2.5
- Particulate matter 10
- Carbon monoxide
- Lead
- Nitrogen dioxide
- Sulfur dioxide

Targets and indicators proposed by the Brendle Group for the dashboard element "Air". Shown are the initially proposed targets and indicators.

## Inherited
## Water Targets & Indicators

Targets:
- Supply
- Quality
- Stream health

Indicators:
- Unregulated stream flow volume
- Snow water equivalent
- Precipitation
- Ground water level
- Attainment of designated uses
- Aquatic life use condition
- Channel stability condition

Targets and indicators proposed by the Brendle Group for the dashboard element "Water". Shown are the initially proposed targets and indicators.

## Inherited
## Ecosystem Targets & Indicators

Targets:
- Alpine
- Spruce-Fir
- Mixed conifer
- Oak
- Mixed Mountain shrub/ Maple
- Sagebrush
- Cliffs
- Riparian
- Wetlands
- Lakes

Indicators:
- Landscape disturbance
- Invasive species
- Degree of fragmentation
- Vegetation condition class
- Level of protection

Targets and indicators proposed by the Brendle Group for the dashboard element "Ecosystems". Shown are the initially proposed targets and indicators.

## Inherited
## Plants and Wildlife Targets & Indicators

Targets:
- Mule deer
- Elk
- Boreal owl
- Northern pygmy owl
- Northern goshawk
- Golden eagle
- Boreal toad
- Bonneville cutthroat trout

Indicators:
- Herd size
- Demographics
- Recruitment
- Range trend
- Roadkill?
- # of active territories
- Habitat condition
- Presence/absence data
- Population estimates

Targets and indicators proposed by the Brendle Group for the dashboard element "Plants and Wildlife". Shown are the initially proposed targets and indicators.

## Inherited
## Soil Targets & Indicators

Targets:
- Soil stability
- Soil health

Indicators:
- Erosion hazard

Targets and indicators proposed by the Brendle Group for the dashboard element "Soils". Shown are the initially proposed targets and indicators.