What Forest Restoration Means for Agriculture and Communities:

William Wallace Covington
Executive Director, The Ecological Restoration Institute
Regents' Professor of Forest Ecology
Northern Arizona University

Presented by: Bruce Greco
Director of Outreach
ECOLOGICAL RESTORATION INSTITUTE
Northern Arizona University

President Barrack Obama,

State of the Union Speech,

February 12, 2013

- "…the fact is, the 12 hottest years on record have all come in the last 15. Heat waves, droughts, wildfires, floods, all are now more frequent and more intense.

- We can choose to believe that Superstorm Sandy, and the most severe drought in decades, and the worst wildfires some states have ever seen were all just a freak coincidence.

- Or we can choose to believe in the overwhelming judgment of science and act before it's too late.

- Now the good news is, we can make meaningful progress on this issue while driving strong economic growth…."

The Challenge….

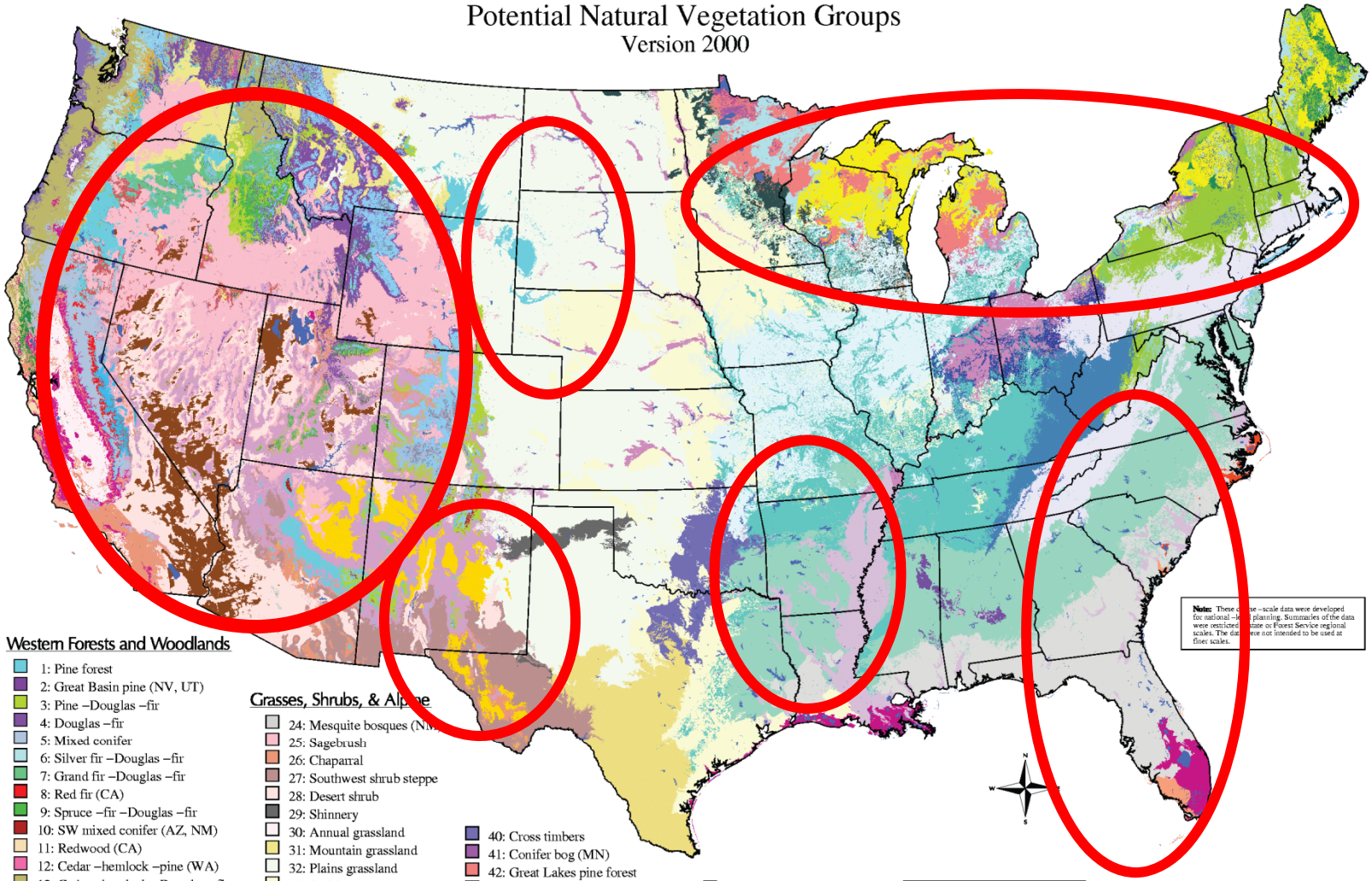
(The bottom line)

- America's forests are "out of whack"
- Frequent fire forests, in particular, have unnaturally high tree densities and fuel loads
- Under these conditions, fire intensity and size have been steadily increasing
- Research shows that restoration can help solve forest health problems and provide economic benefits
- We must increase the scale and pace of treatments

What is a “Frequent Fire” Forest?

- Forests which over evolutionary time have become adapted to frequent, low intensity surface fire
- Examples include longleaf pine, red pine, ponderosa pine, Jeffrey pine, and a wide range of dry oak-hickory forests
- Under natural conditions, these frequent fires kept tree populations in check, recycled nutrients, and prevented fuel accumulation

Potential Natural Vegetation Groups
Version 2000



Note: These c[illegible]se –scale data were developed for national –l[illegible] planning. Summaries of the data were restricted [illegible]tate or Forest Service regional scales. The dat[illegible]re not intended to be used at finer scales.

Western Forests and Woodlands

- 1: Pine forest
- 2: Great Basin pine (NV, UT)
- 3: Pine –Douglas –fir
- 4: Douglas –fir
- 5: Mixed conifer
- 6: Silver fir –Douglas –fir
- 7: Grand fir –Douglas –fir
- 8: Red fir (CA)
- 9: Spruce –fir –Douglas –fir
- 10: SW mixed conifer (AZ, NM)
- 11: Redwood (CA)
- 12: Cedar –hemlock –pine (WA)
- 13: Cedar –hemlock –Douglas –fir
- 14: Spruce –cedar –hemlock (WA, OR)
- 15: Fir –hemlock (WA, OR)
- 16: Spruce –fir
- 17: Lodgepole –subalpine (CA)
- 18: California mixed evergreen
- 19: Oakwoods (CA)
- 20: Mosaic cedar –hemlock – Douglas –fir & oak (OR)
- 21: Alder –ash (OR, WA)
- 22: Juniper –pinyon
- 23: Juniper steppe

Grasses, Shrubs, & Alpine

- 24: Mesquite bosques (NM)
- 25: Sagebrush
- 26: Chaparral
- 27: Southwest shrub steppe
- 28: Desert shrub
- 29: Shinnery
- 30: Annual grassland
- 31: Mountain grassland
- 32: Plains grassland
- 33: Prairie
- 34: Desert grassland
- 35: Texas savanna
- 36: Wet grassland
- 37: Alpine meadows –barren

Eastern Forests

- 38: Oak savanna (ND)
- 39: Mosaic bluestem/oak – hickory
- 40: Cross timbers
- 41: Conifer bog (MN)
- 42: Great Lakes pine forest
- 43: Spruce –fir
- 44: Maple –basswood (MN, WI, IL)
- 45: Oak –hickory
- 46: Elm –ash forest
- 47: Maple –beech –birch
- 48: Mixed mesophytic forest
- 49: Appalachian oak
- 50: Transition Appalachian oak – northern hardwood
- 51: Northern hardwoods
- 52: Northern hardwoods –fir (MA, NH, NY)
- 53: Northern hardwoods –spruce
- 54: Northeastern oak –pine
- 55: Oak –hickory –pine
- 56: Southern mixed forest
- 57: Loblolly –shortleaf pine
- 58: Blackbelt
- 59: Oak –gum –cypress

Other

- 60: Northern floodplain
- 61: Southern floodplain
- 62: Barren
- 63: Water

This map is based on a terrain – matched refinement of Kuchler's Potential Natural Vegetation (PNV) map. Kuchler's PNV map was digitized for the conterminous United States, then adjusted to match terrain using a 500 meter Digital Elevation Model, 4th Code Hydrologic Unit delineations, and Ecological Subregions (Bailey's Sections). These biophysical data layers were integrated with two current vegetation layers (Resource Planning Act's 1992 map of Forest Types and map of Forest Densities, and USGS EROS Data Center's 1991 map of Land Cover Characterization) to develop generalized successional pathway diagrams. Expert regional panels refined the PNV map based on these successional pathways.

PNV is the "climax" vegetation that will occupy a site without disturbance or climatic change. PNV is therefore an expression of environmental factors such as topography, soils, and climate across an area. Where cover type is a classification of existing vegetation, PNV is a site classification based on climax vegetation. Because the existing cover type at any particular location and time may reflect a vegetation community anywhere along its successional pathway – from seral to climax – the cover type may be the same as the PNV.

This product was developed by the Fire Modeling Institute at the Fire Sciences Laboratory, Missoula, Montana through funding from:
USDA FS/USDI Joint Fire Sciences Program
in collaboration with
USDA Forest Service, Fire and Aviation Management
http://www.fs.fed.us/fire/fuelman

Unnaturally High Tree Densities and Climate Change are a Recipe for Disaster

Crownfires are the latest in a long series of symptoms of declining ecosystem health. Impacts include:

- Loss of herbaceous cover
- Increased erosion
- Tree population explosions
- Watershed degradation
- Loss of plant and animal diversity
- Loss of esthetic values
- Unnatural insect and disease epidemics
- Shift to catastrophic crownfires
- Destruction of human and wildlife habitats

TD1

What Options Are Available?

- Restoration based approaches are proven at a small scale (5000+ ac)
- Implementation actions must be tested and refined as we apply them at large scales (1,000,000+ ac), in an adaptive management approach
- Multi-scaled collaborative approaches must be supported with best available science
- Insist on comprehensive landscape scale restoration solutions
- Act at a pace and scale consistent with the current forest landscape health crisis

Slide 10

TD1 Combine elements of this slide into the next one.
Tayloe Dubay, 2/15/2013

TD5

What is ecological restoration?

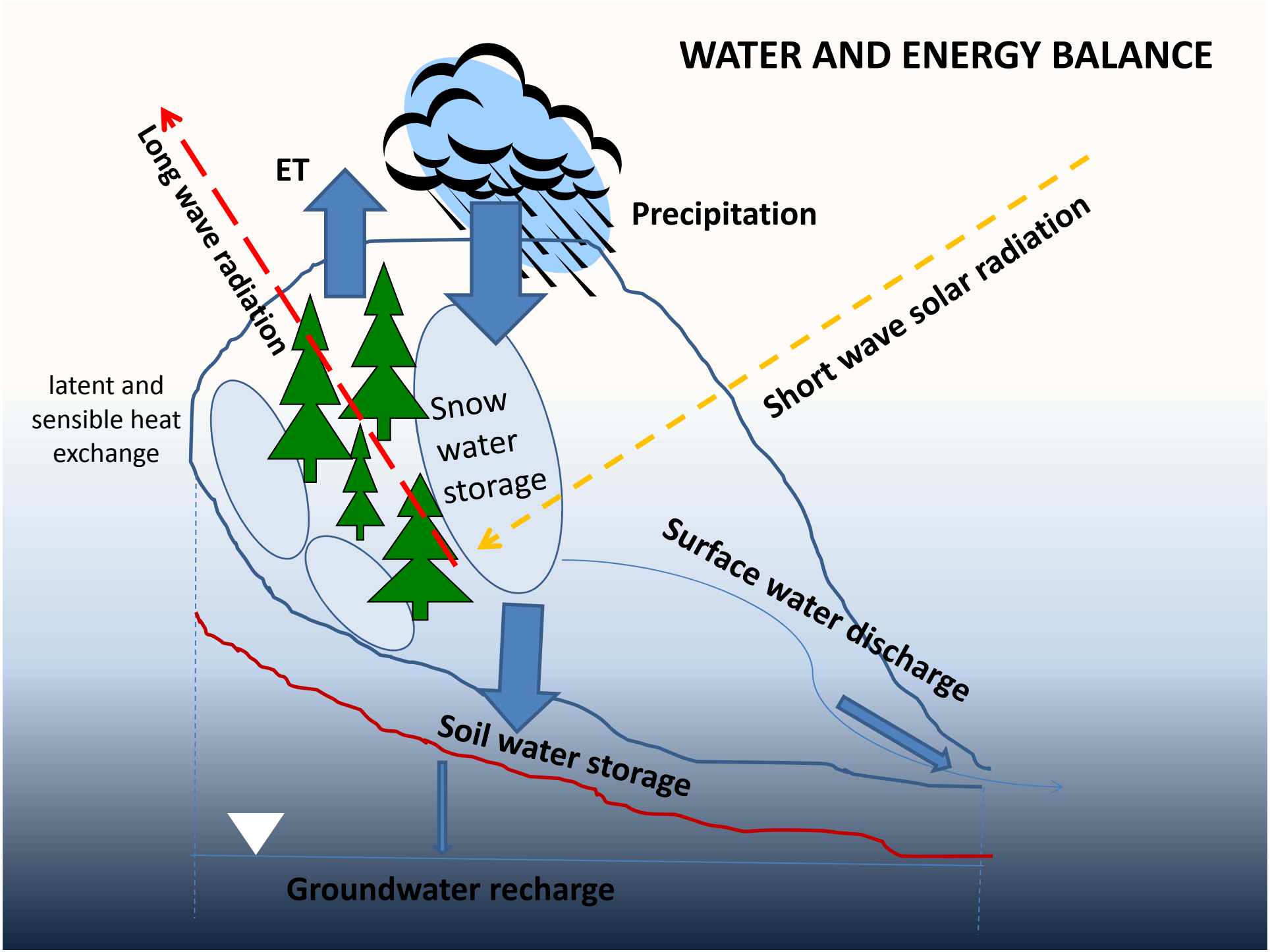
- The aim of restoration is
  - to re-establish and enhance the resilience,
  - adaptive capacity,
  - and sustainability of forests
  - through treatments that incrementally return the ecosystem to a state that is within a historic range of variability of conditions

Slide 11

TD5 Combine this slide with slide 12

Tayloe Dubay, 2/15/2013

Shultz Fire – 2010
Flagstaff, Arizona


WATER AND ENERGY BALANCE
Long wave radiation
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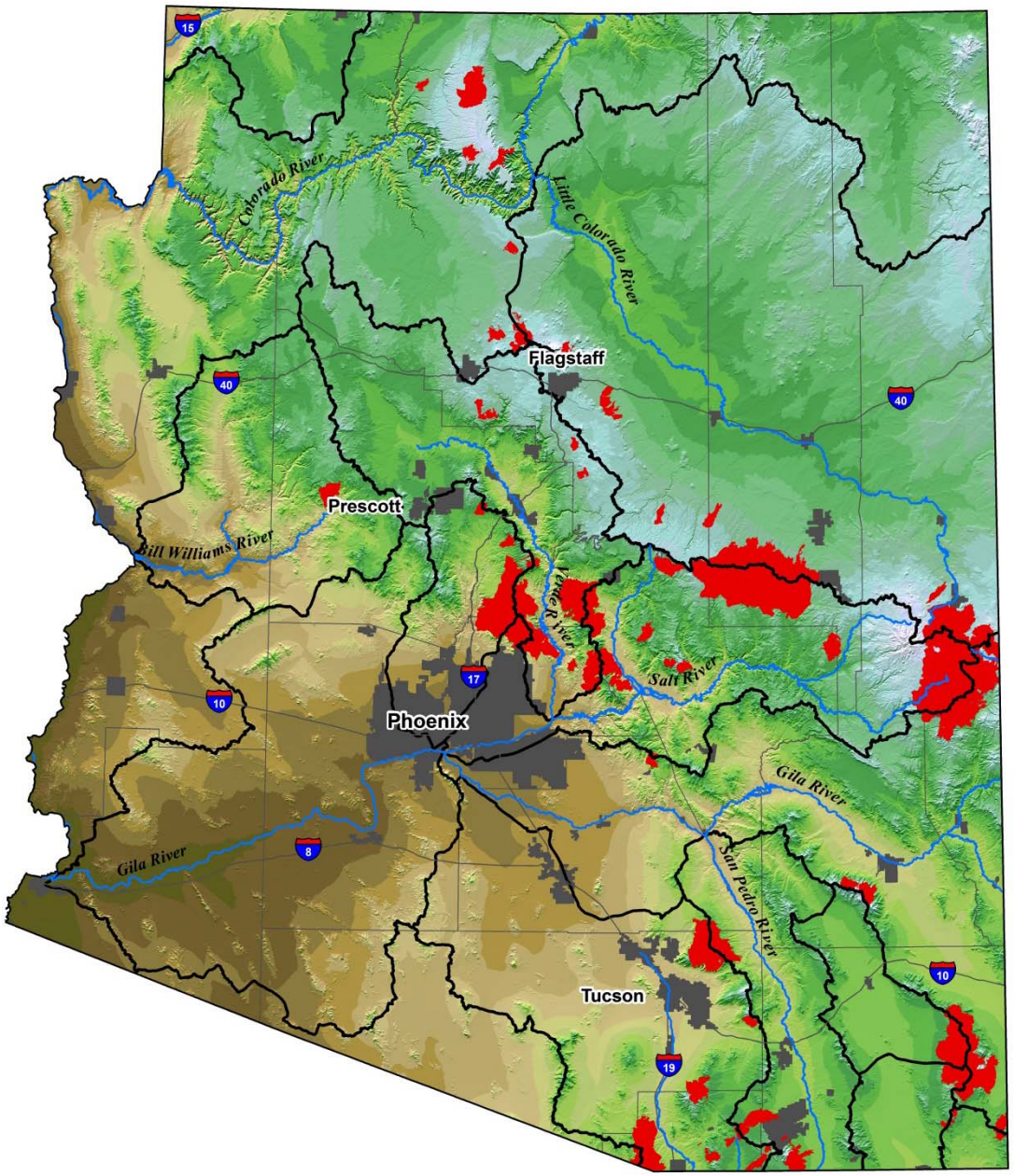
Precipitation
Short wave solar radiation
latent and
sensible heat
exchange
Snow
water
storage
Surface water discharge
Soil water storage
Groundwater recharge



Major Rivers

Interstate Highways

Watersheds

Wildfires > 5000 acres

Counties

Urban Areas

Map data were acquired from the Arizona State Land Department, The United States Geological Survey, and the United States Forest Service, Region 3. Map preparation by the Ecological Restoration Institute.

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