

# Climate Change in the WILD West



**WILD =**  
Water,  
Invasive species,  
Landscape ecology,  
energy Development

# Into the WILD West: Outline

- Inspired by Earth to Sky IV:
  - A regional perspective on a global problem
  - Why, who, what, where, when, and how?
  - Funding
  - Best practices
  - Lessons learned

# The power of place:

## Regional perspectives on a global problem

- Water
  - Arid lands
  - Increasingly erratic precipitation patterns
  - Springs, reservoirs, rivers
- Invasive species
  - Increasingly competitive
  - Shifting fire ecology
- Landscape ecology
  - Plant and animal communities shifting up elevation and latitude gradients
- energy Development
  - Industrial-scale, at times water-intensive solar and wind projects
  - Sensitive habitat for desert tortoises, horned lizards and others

# WHO is participating?

## High school youth – at two schools

- Death Valley Academy
  - Small rural school
  - All 16 high school students participate
  - Limited resources – no computer lab, no GIS experience
  - Multi-year program
- West Career and Technical Acad
  - Public charter-style high school
  - One GIS class participates
  - GIS lab, GIS class
  - Two month program

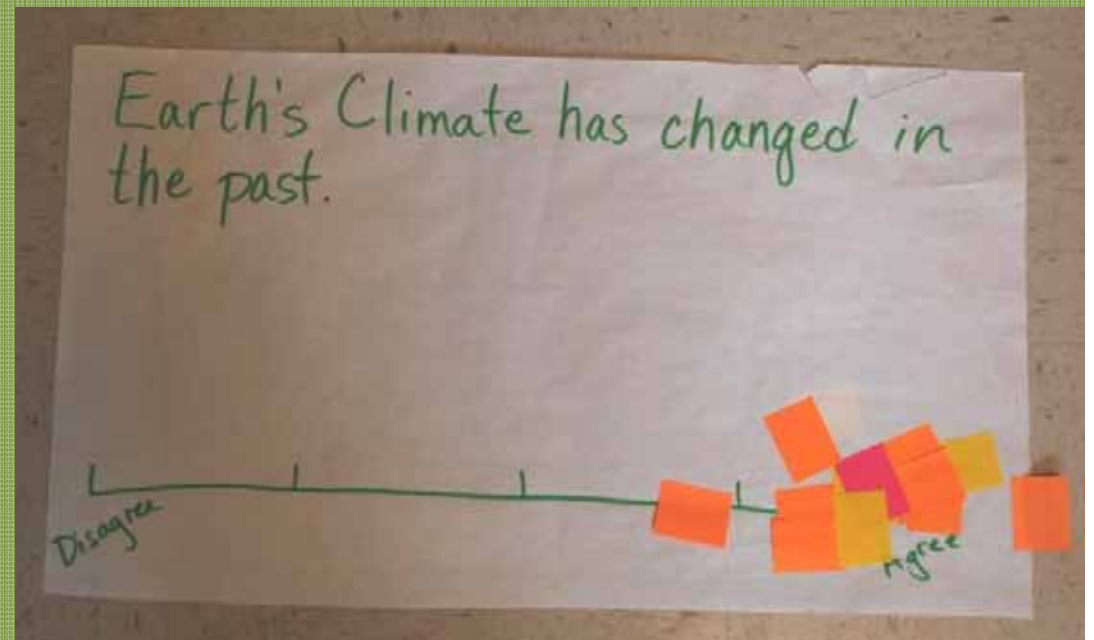


# WHY Climate Change in the WILD West?

- Increase interest in STEM careers
- Provide students with marketable skills in GPS, GIS, and remote sensing data analysis
- Create ownership of local climate change impacts and mitigation efforts
- Cultivate a sense of stewardship toward public lands among youth

# WHAT does the program entail?

- Classroom sessions on climate change and one or more of the WILD content strands



# WHAT does the program entail?

- Classroom sessions on climate change and one or more of the WILD content strands



# WHAT does the program entail?

- Classroom sessions on climate change and one or more of the WILD content strands

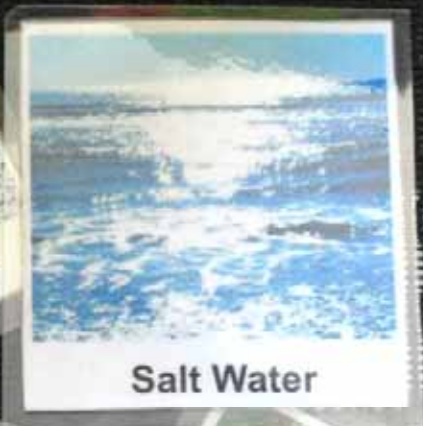




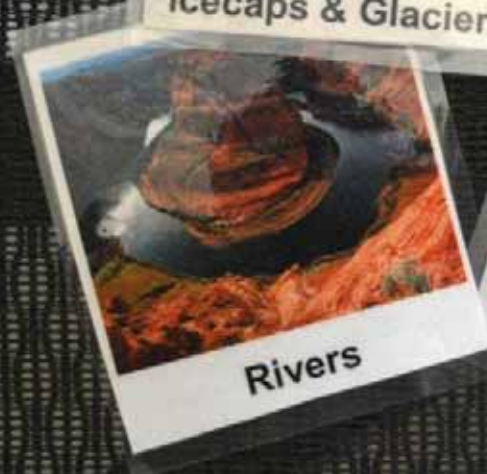
**Icecaps & Glaciers**



**Groundwater**



**Salt Water**



**Rivers**



**Lakes**



**Swamps**



**Salt Water**



**Icecaps & Glaciers**



**Groundwater**



**Swamps**



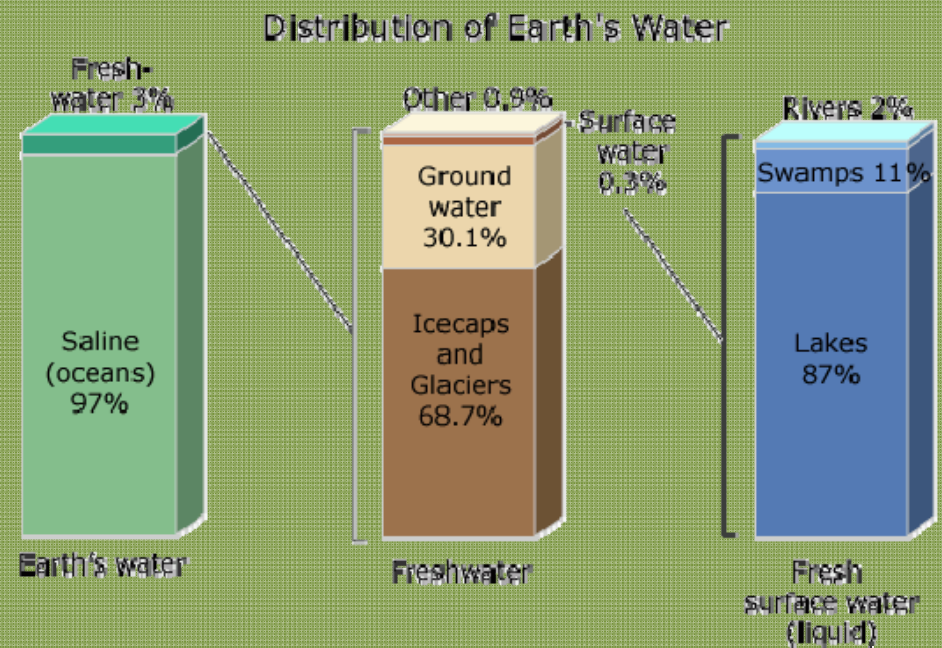
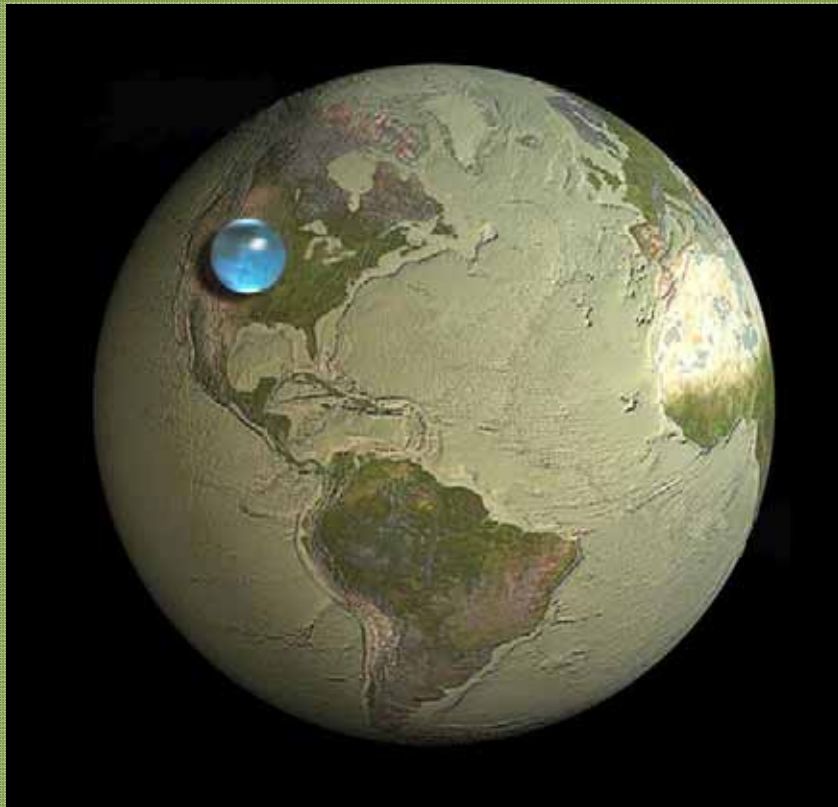
**Lakes**



**Rivers**

# WHAT does the program entail?

- Classroom sessions on climate change and one or more of the WILD content strands



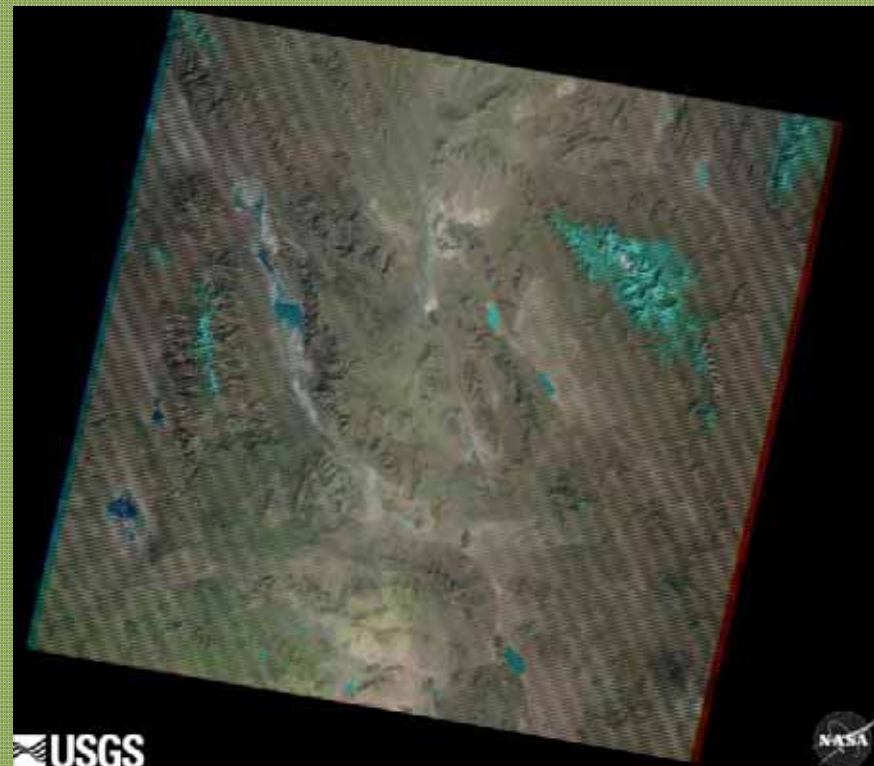
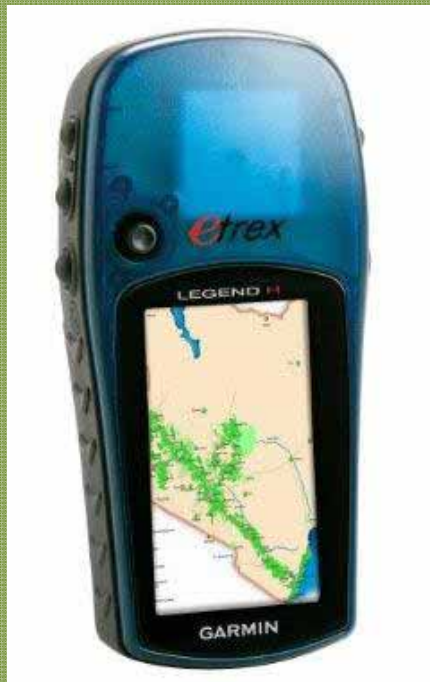
# WHAT does the program entail?

- Exploratory field trips to local public lands where students select a long-term service-learning project (WHERE)



# WHAT does the program entail?

- Classroom and field sessions on GPS, GIS use
- NASA Partner presentations on using remote sensing data



# WHAT projects might students pursue?

- Podcast on danger of increased temperature on Devil's Hole pupfish vitality
- Tamarisk removal in partnership with BLM along Amargosa River (which feeds into Death Valley NP)
- Monitoring of erratic spring pool levels at Badwater, home of endemic amber snail
- Exploration of pinyon juniper forest mortality at lower elevations

# HOW did you get money & support?

- National Park Foundation Small Grant ~\$10k
  - Laptop Computers
  - Travel for NASA Partner
  - Transportation for students
- Unilever Small Grant ~\$10k
  - More travel/transportation support
  - Intern hired through Death Valley Natural History Association
- George Melendez Wright Climate Change Intern, sponsored by the NPS Natural Resource Program Center (NRPC)
  - Sept. through Dec. 2011
- ESRI ArcView Software *Mapping Our World* (50 free site licenses)

# WILD best practices

- Citizen science
  - Participants make a legitimate contribution to a real project
- Service learning
  - Earth Force model <http://www.earthforce.org>
- Project-based
  - Concrete goals, clear path, visible and attainable outcomes
- Student-directed
  - Ownership
- Longitudinal (WHEN)
  - Time to create relationships with people and public lands
- Use technology
  - GPS units, GIS software, remote sensing data – all marketable skills
- Cultivate stewardship
  - The legacy of public lands depends on today's youth

# WILD lessons learned

- Building partnership relationships takes time
  - Give yourself several months to get everyone on board
  - Prepare to prove yourself
- Big grants require a university partner
  - Spend some time looking for someone with aligned research interest
  - UNLV Public Lands Institute
  - Beware of massive overhead!
- School districts have their own agenda
  - Find a champion
  - Target a small or alternative school
- NPS staff already have busy operations
  - How can you balance your existing obligations with grand schemes for new programs?