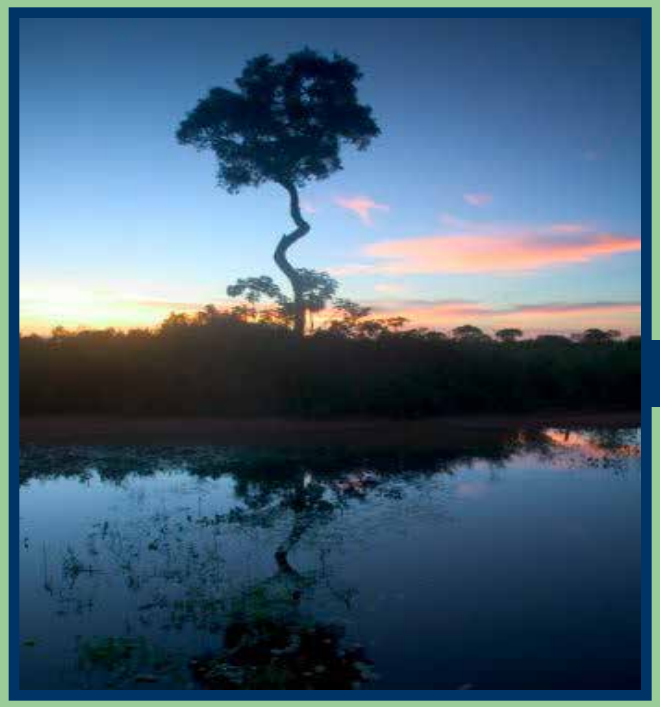
Outside the ‘Zone’

Why We Are All Advocates of Ecology



Jacquelyn R. Duke, PhD
Baylor University

Little Creek

Life Beyond Little Creek

Courtesy TES Columbia University

Courtesy TripAdvisor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Challenging
Environment


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59
BAYLOR
10
BAYLOR
85
BAYLOR
98


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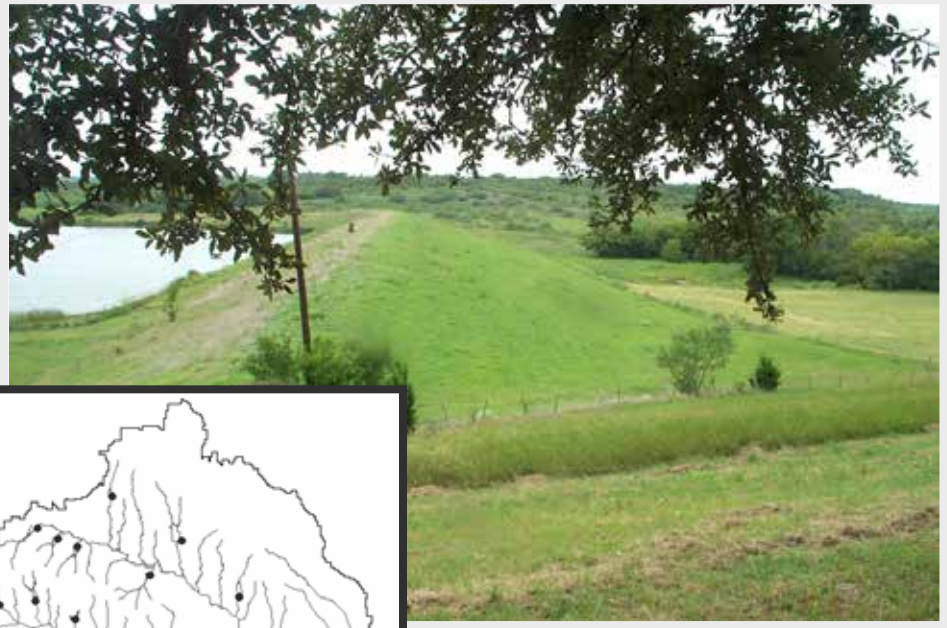
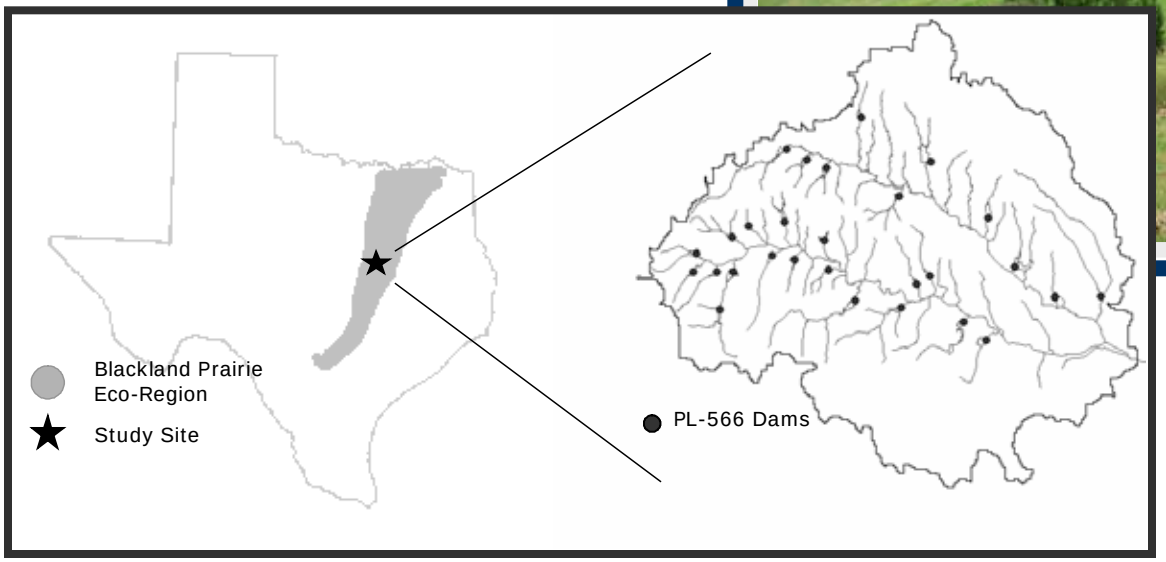
Small Dams and Riparian Zones

- Public Law 83-566 - dams on intermittent tributaries
- Hyporheic zone formation

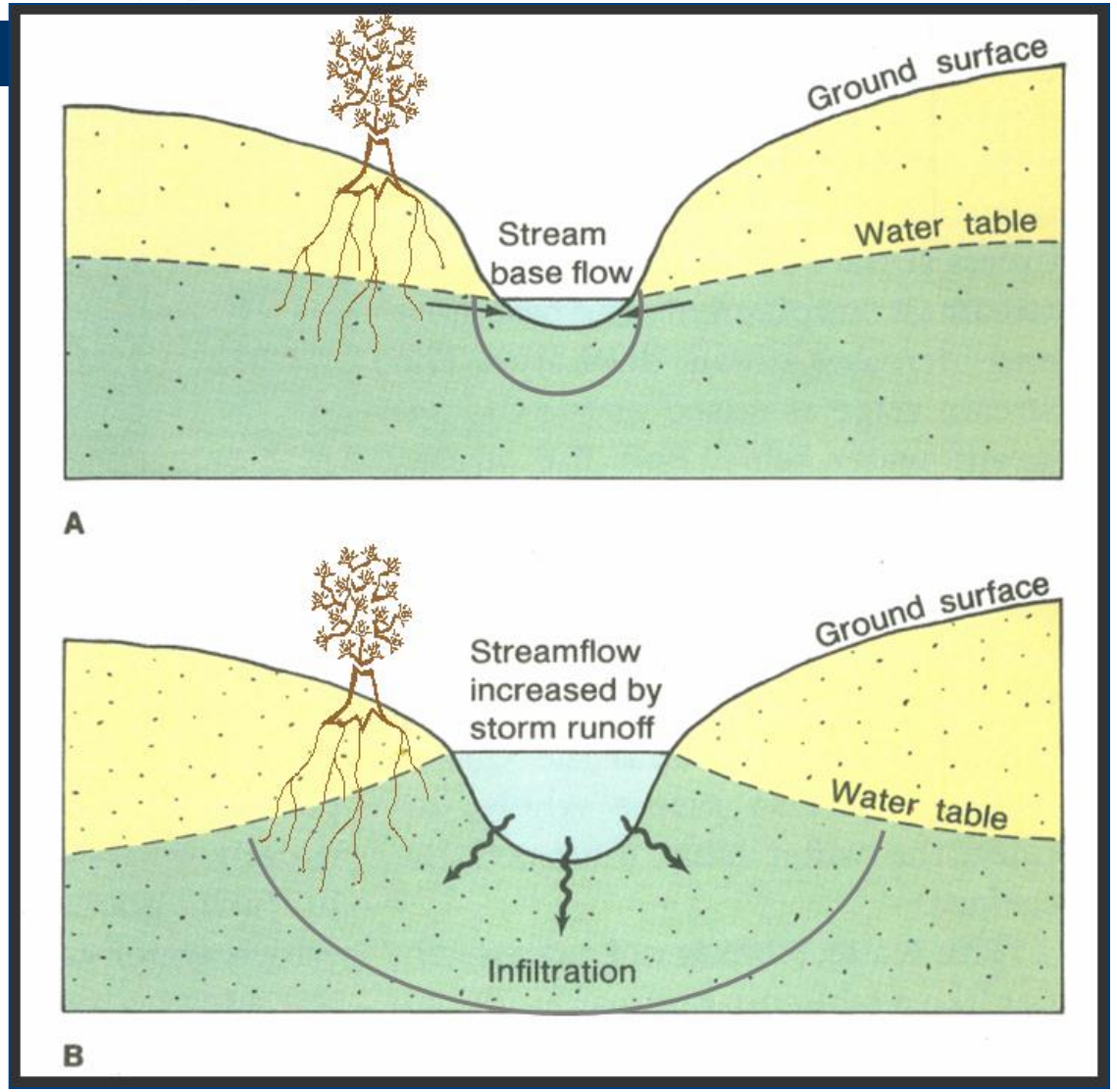




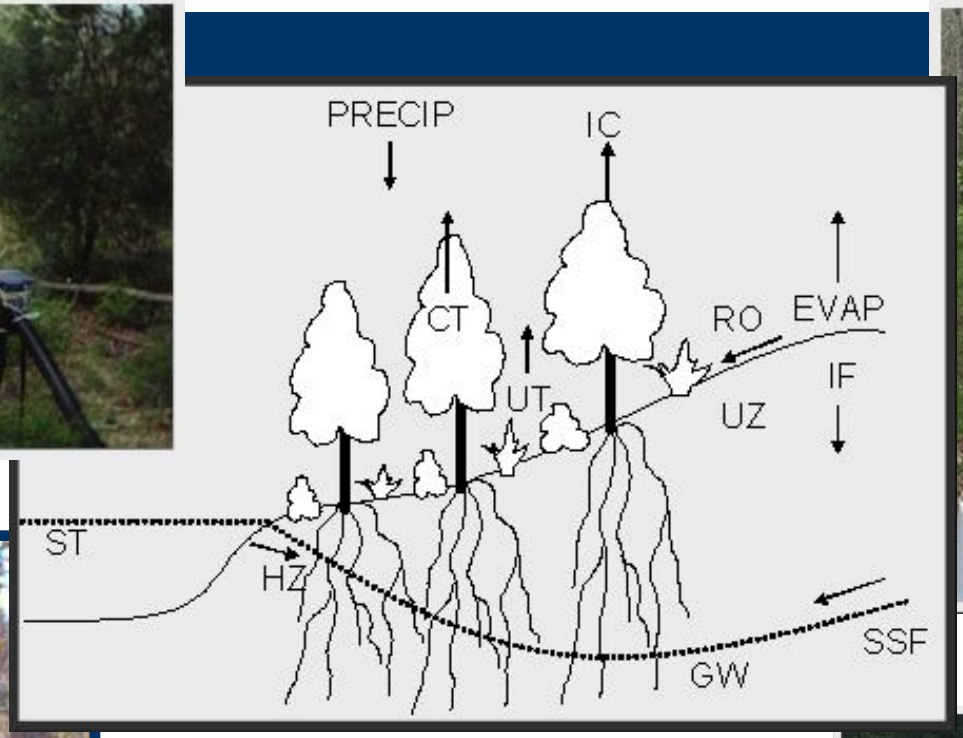
Cow Bayou Tribs, McLennan County

Formation of Hyporheic Zone

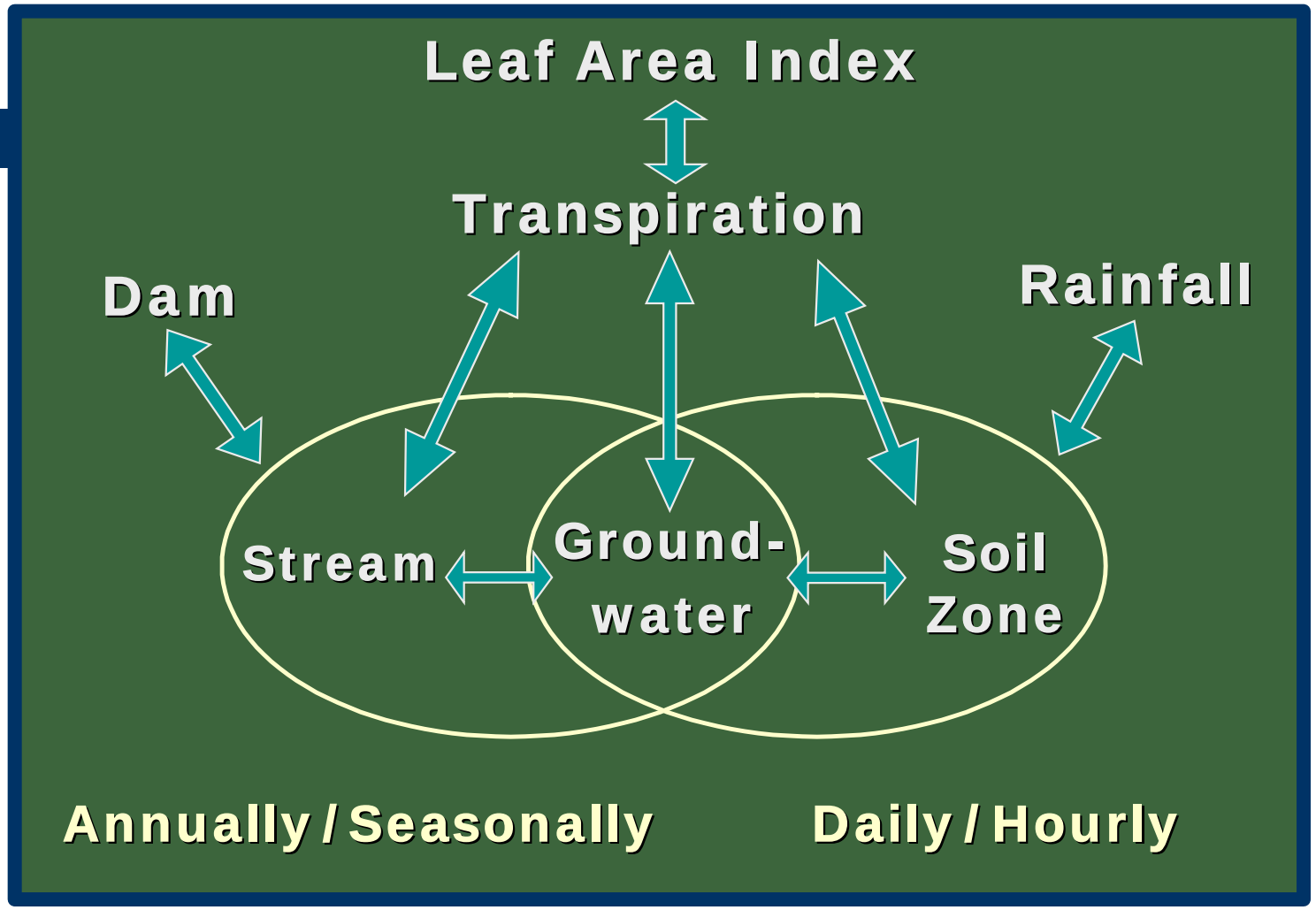
- A – Low-flow, little discharge to hyporheic zone
- B – Increased flow, expansion of hyporheic zone



Site Water Balance Studies



Conceptual Model



- Seasonal coupling - transpiration and hydro fluxes
- Positive feedback, expansion of hyporheic zone

Dendroecology

New field:
Dendro + Riparian Zones

Courtesy futuresmag.com

Courtesy futuresmag.com

Downcutting Along Mill Creek

Above the nick point

Average distance = 10m
Vertical height=4 m

Below the nick point

Average distance = 23m
Vertical height=10 m

Isotopic Analysis of Water Sources

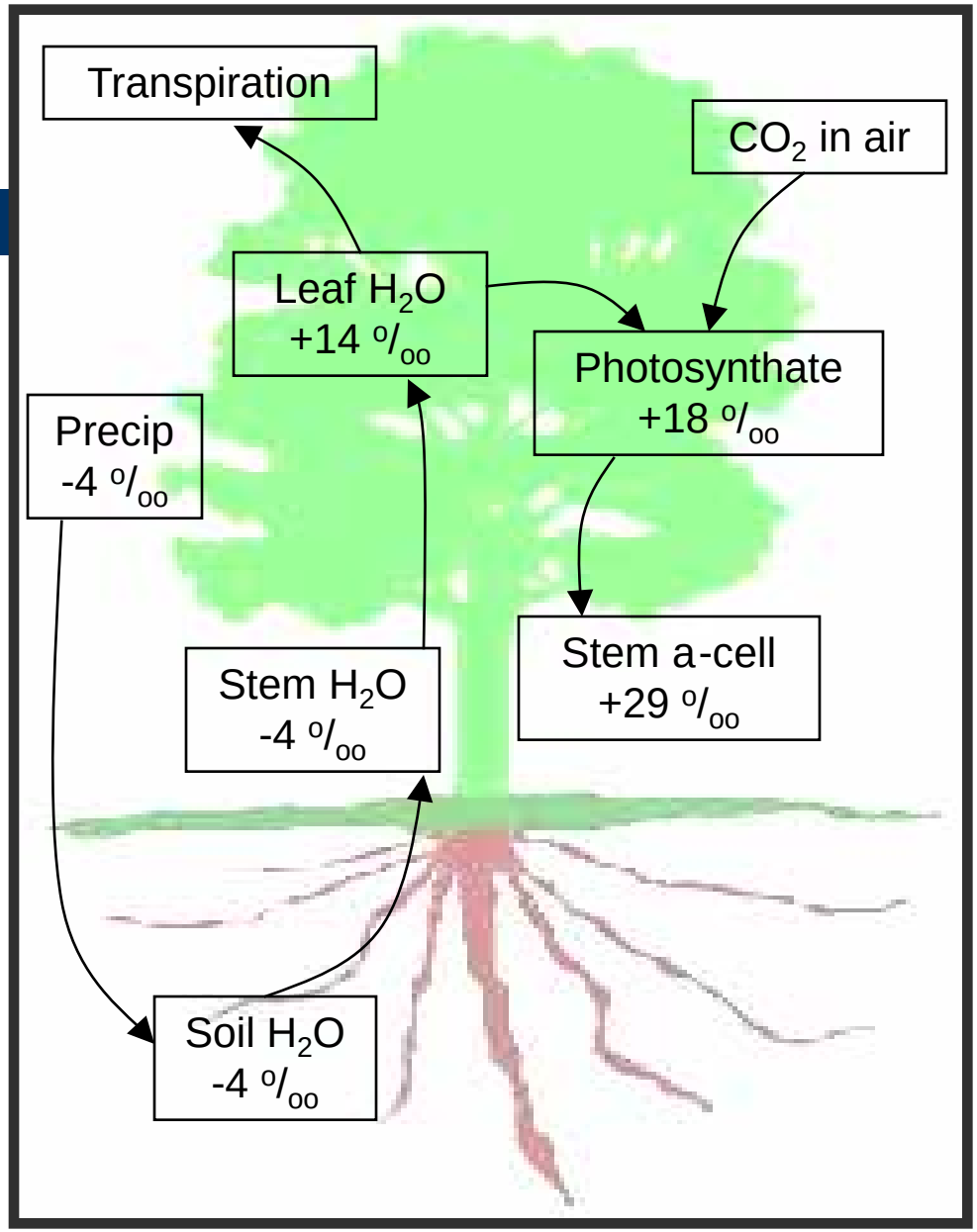
- Water Sources
- Tree cellulose
- Modeling

Modeling

- Source Water Model (Barbour *et al.* 2004)
- Site Water Balance Model
- 3-component Mixing Model (Zencich *et al.* 2002)

Results

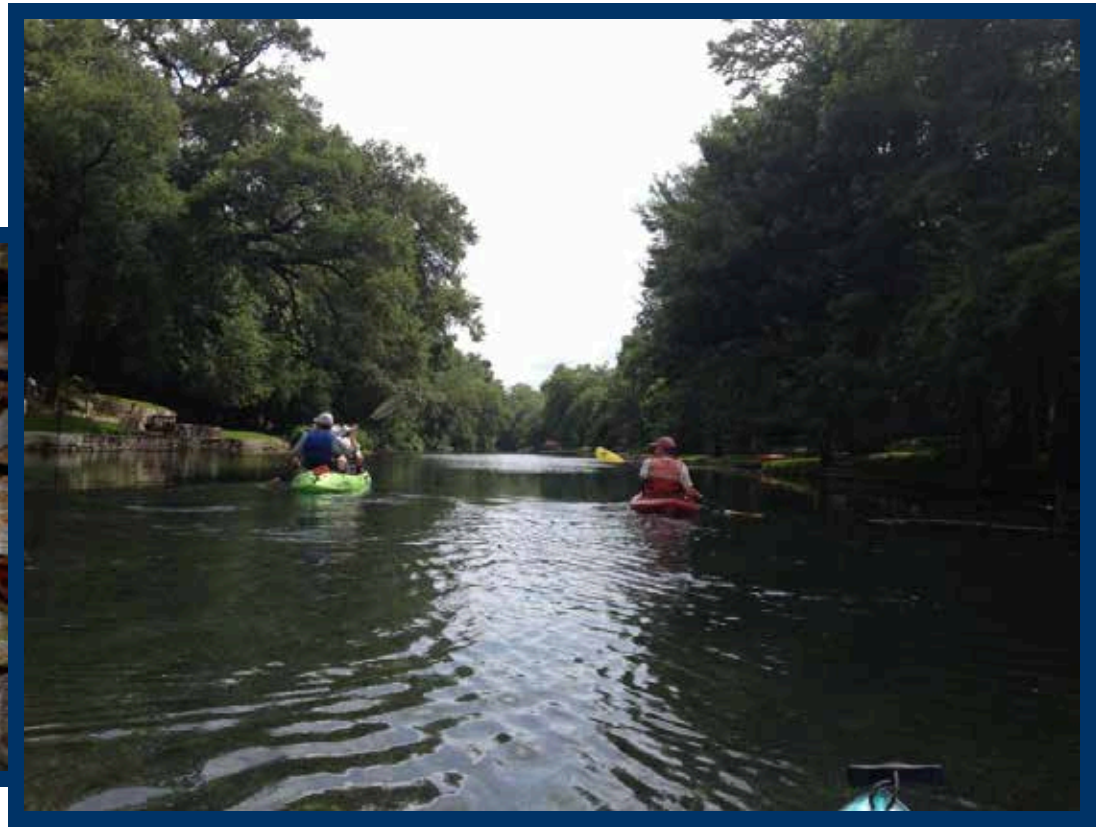
- stream contributes 45% - 80% of water



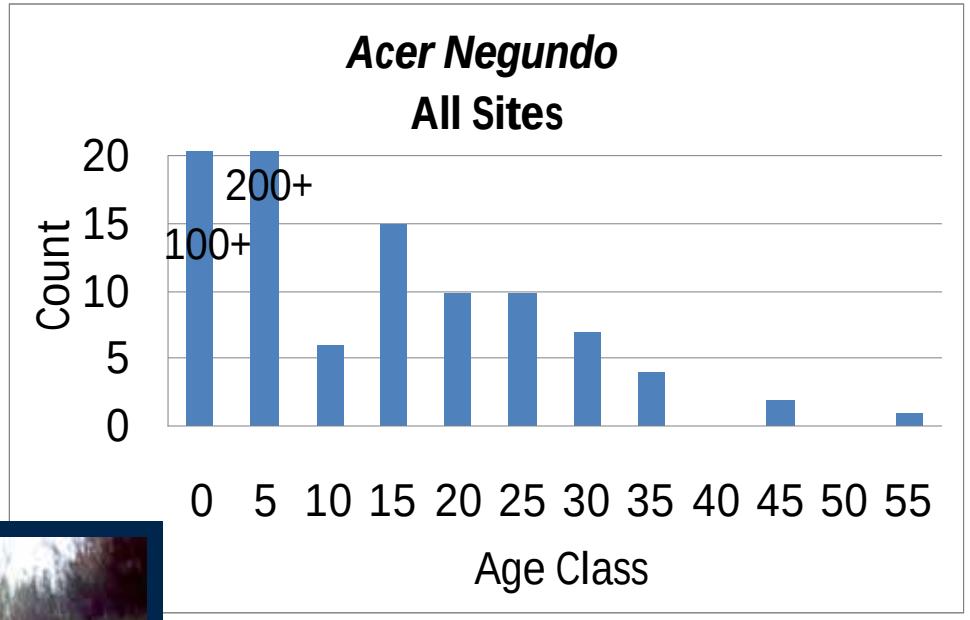
Redrawn from Dawson *et al.* 2002

Texas Rivers

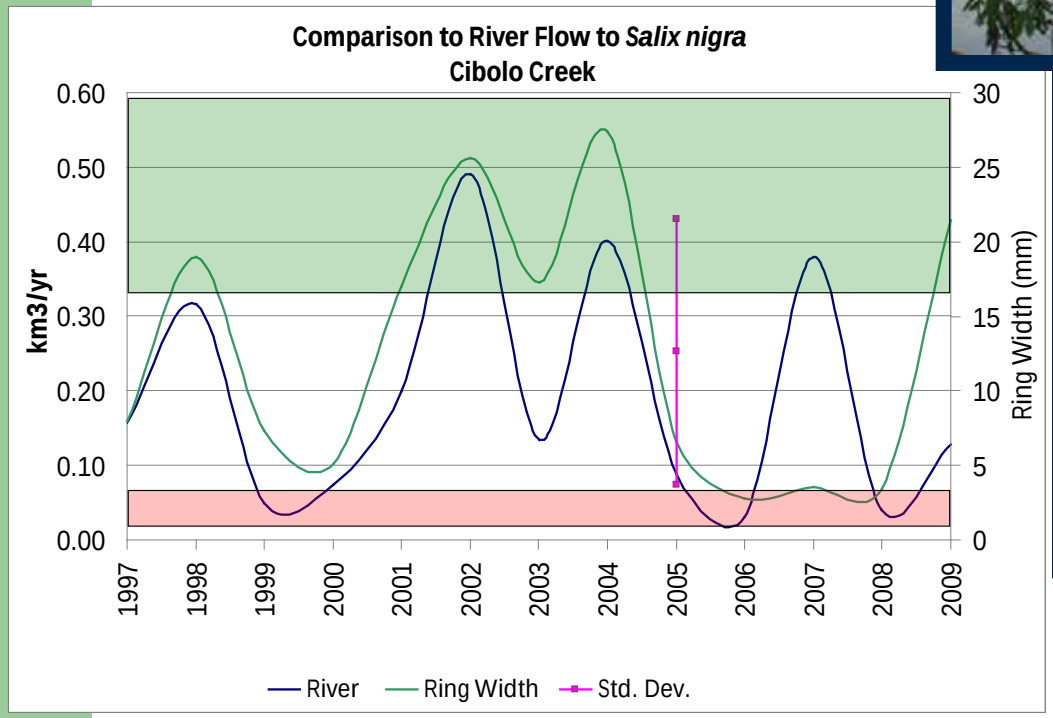
- Characterizing
- Conserving



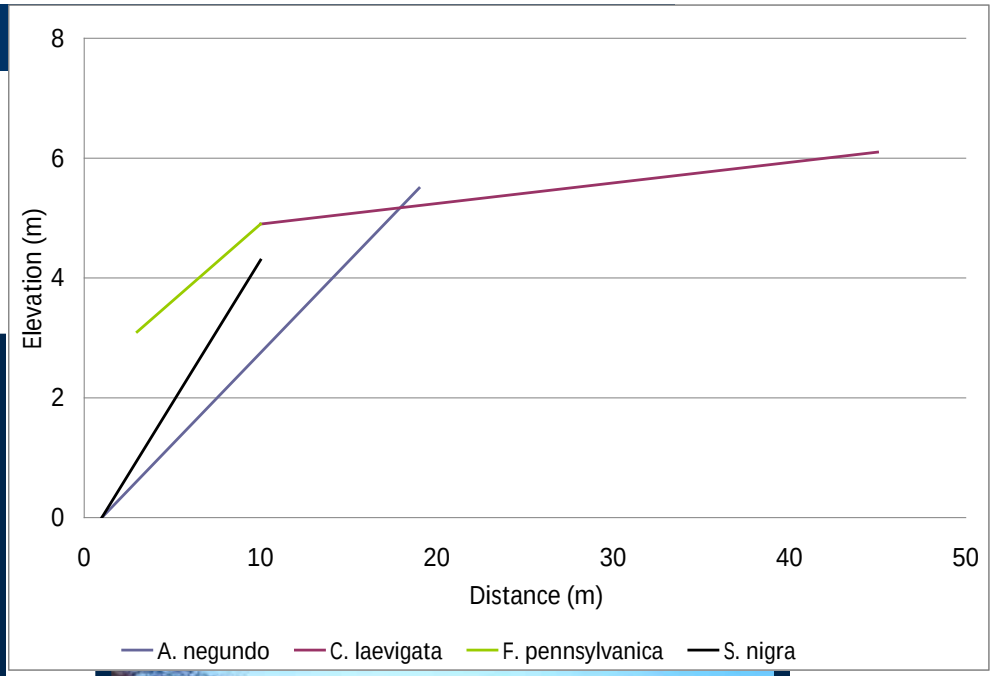
Age Classes and Productivity



Response to Flow

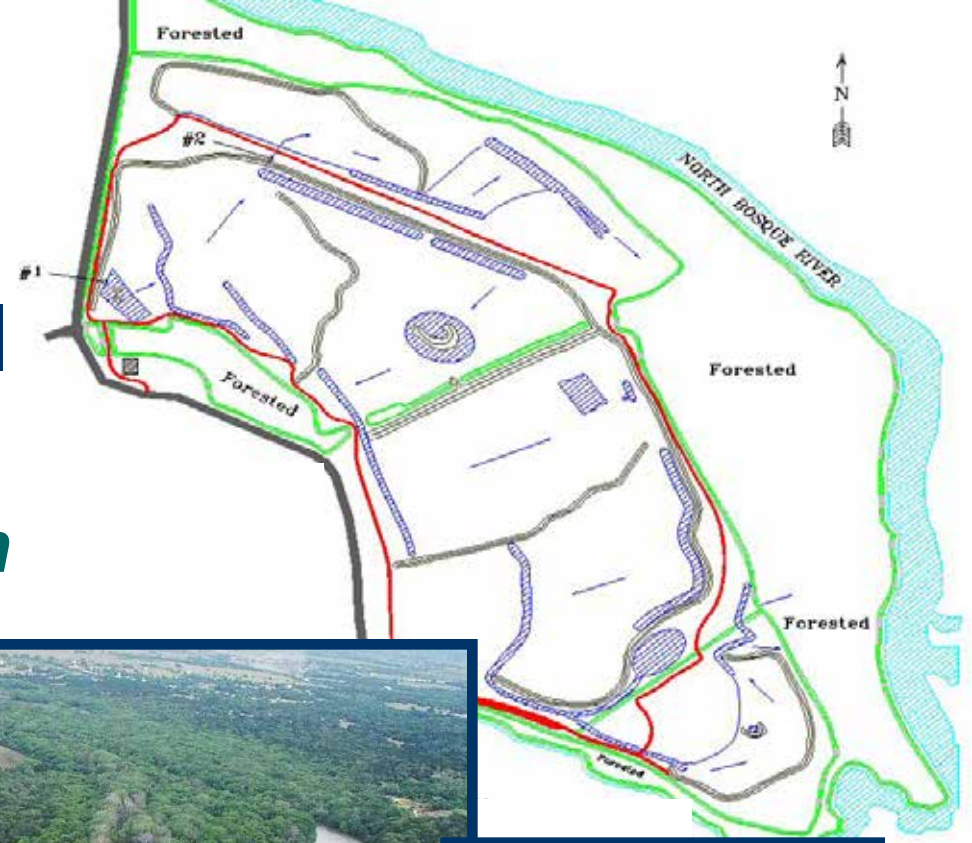


Spatial Coverage and Future Predictions



Wetland Riparian Zones

Riparian Obligate
Facultative Riparian



Why Outside the ‘Zone’?

- Scientific Literacy
- Societal Acceptance of Science

- Amid much change…

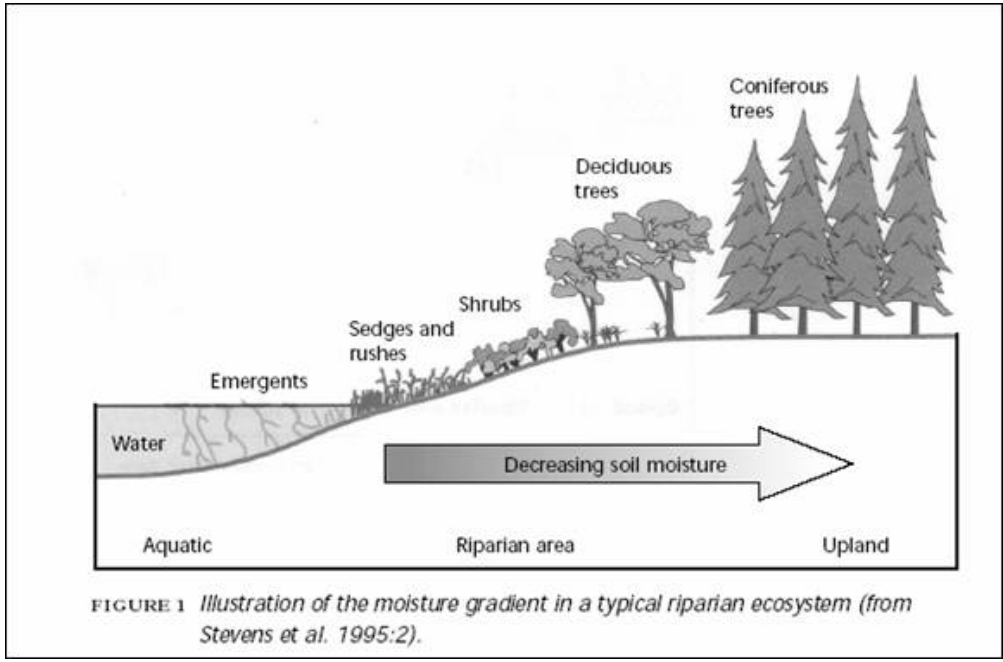


FIGURE 1 *Illustration of the moisture gradient in a typical riparian ecosystem (from Stevens et al. 1995:2).*

Traditional disciplines à barely recognizable forms, new fields.

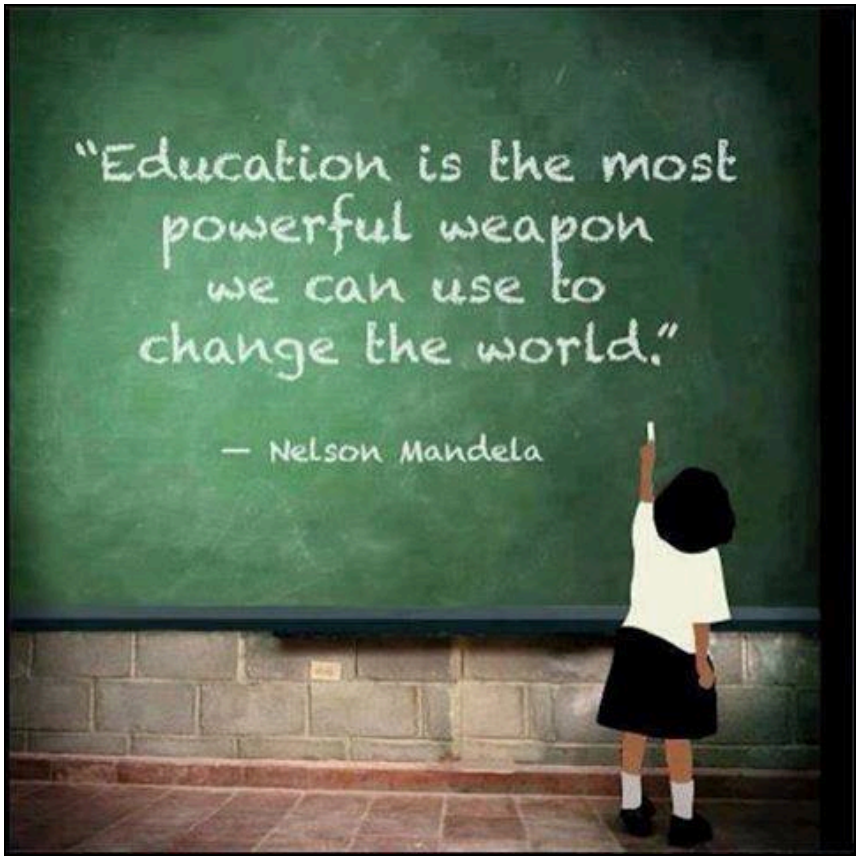
- E.O. Wilson

Scientific Literacy

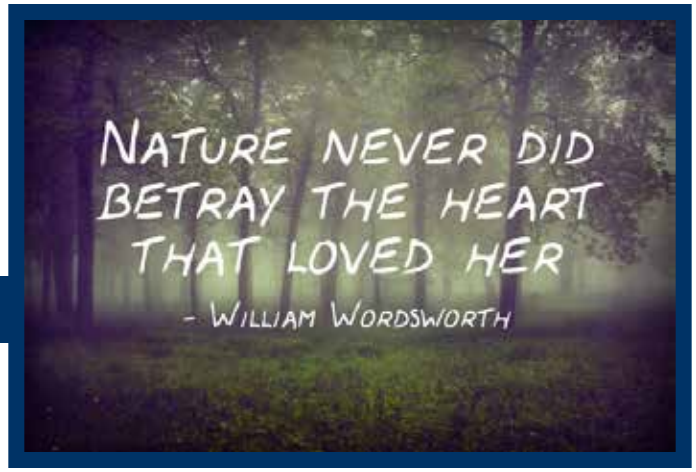
- *Scientific Literacy: How Do Americans Stack Up?* Science Daily 2/27/09

  28%

- *Put a Little Science in Your Life* Brian Greene 6/1/08
  - Education



Scientific Literacy



- *Why Should You Be Scientifically Literate?* Robert M. Hazen 12/02
  - Civics
  - Aesthetics
  - Intellectual Coherence
- Civics
  - Public issues require some scientific background
  - Scientific illiteracy thwarts our democratic government

Scientific Literacy

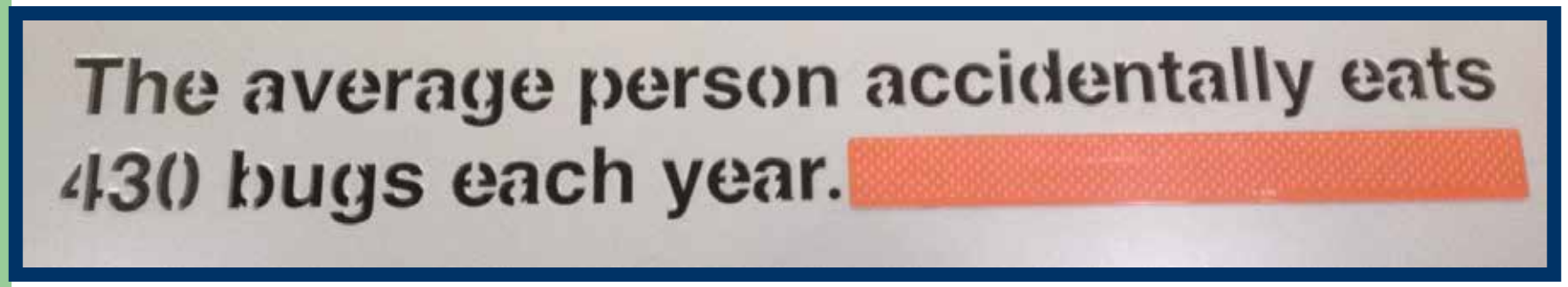
- Aesthetics
  - over-arching natural laws
  - Scientific vision of nature is exceedingly beautiful and elegant
  - A scientifically illiterate person is effectively cut off from an immensely enriching part of life
  - Biophilia – E.O. Wilson

Courtesy of ScienceIsAwesome

Courtesy of washingtondems.com

Scientific Literacy

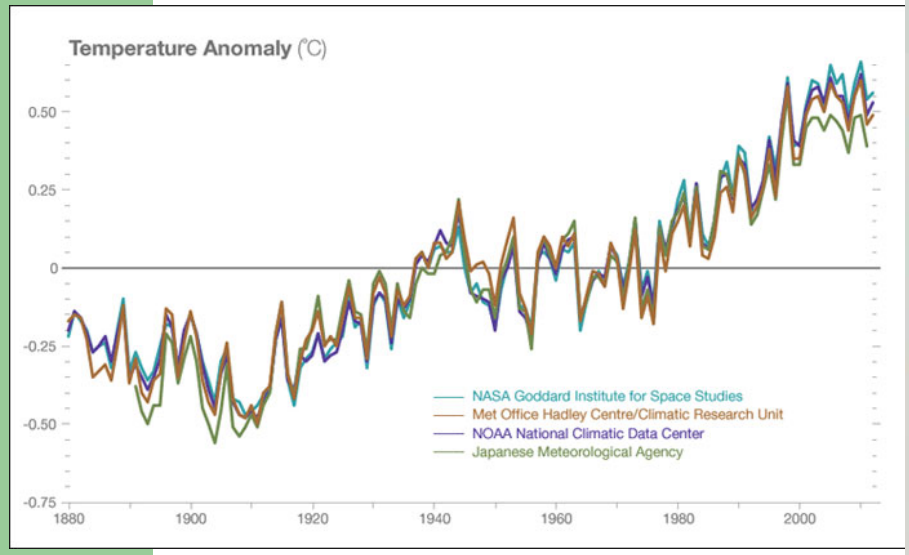
- Intellectual Coherence
  - Society is tied to discoveries of science
  - Influences intellectual climate
  - ‘Science is a tradition. And as we know from history’s darkest moments, even the most enlightened traditions can be broken and lost.”
    - Adam Frank (Univ of Rochester)



From the Perot Museum of Nature and Science

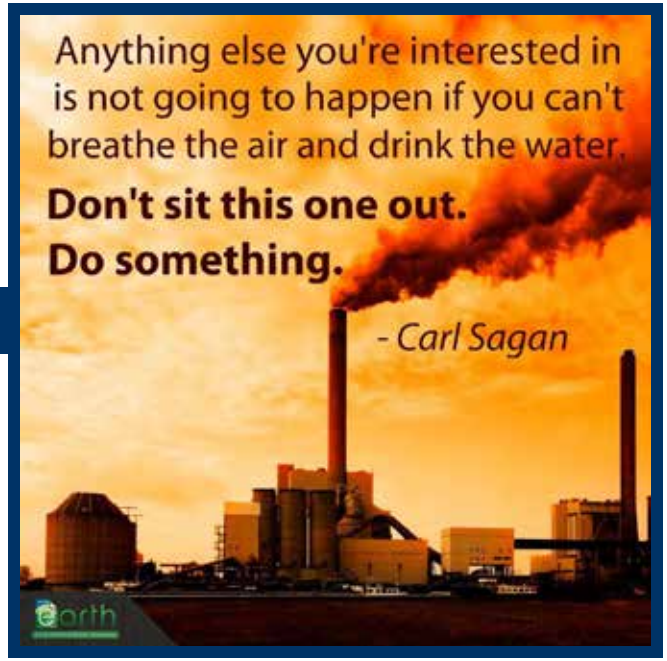
Societal Acceptance

- *Welcome to the Age of Denial* Adam Frank 8/21/13
- "Today, however, it is politically effective, and socially acceptable, to deny scientific fact."



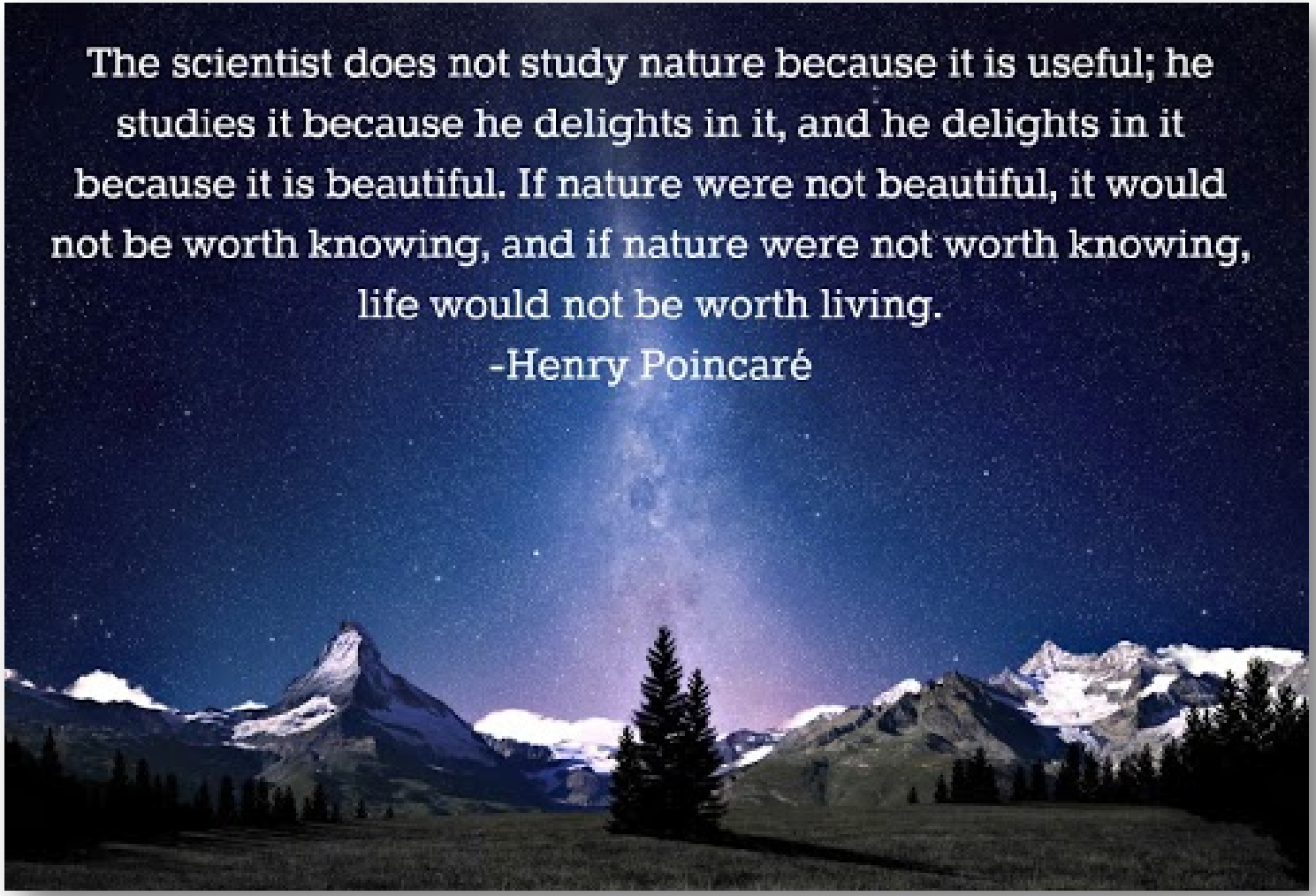
Courtesy of NASA

Advocates



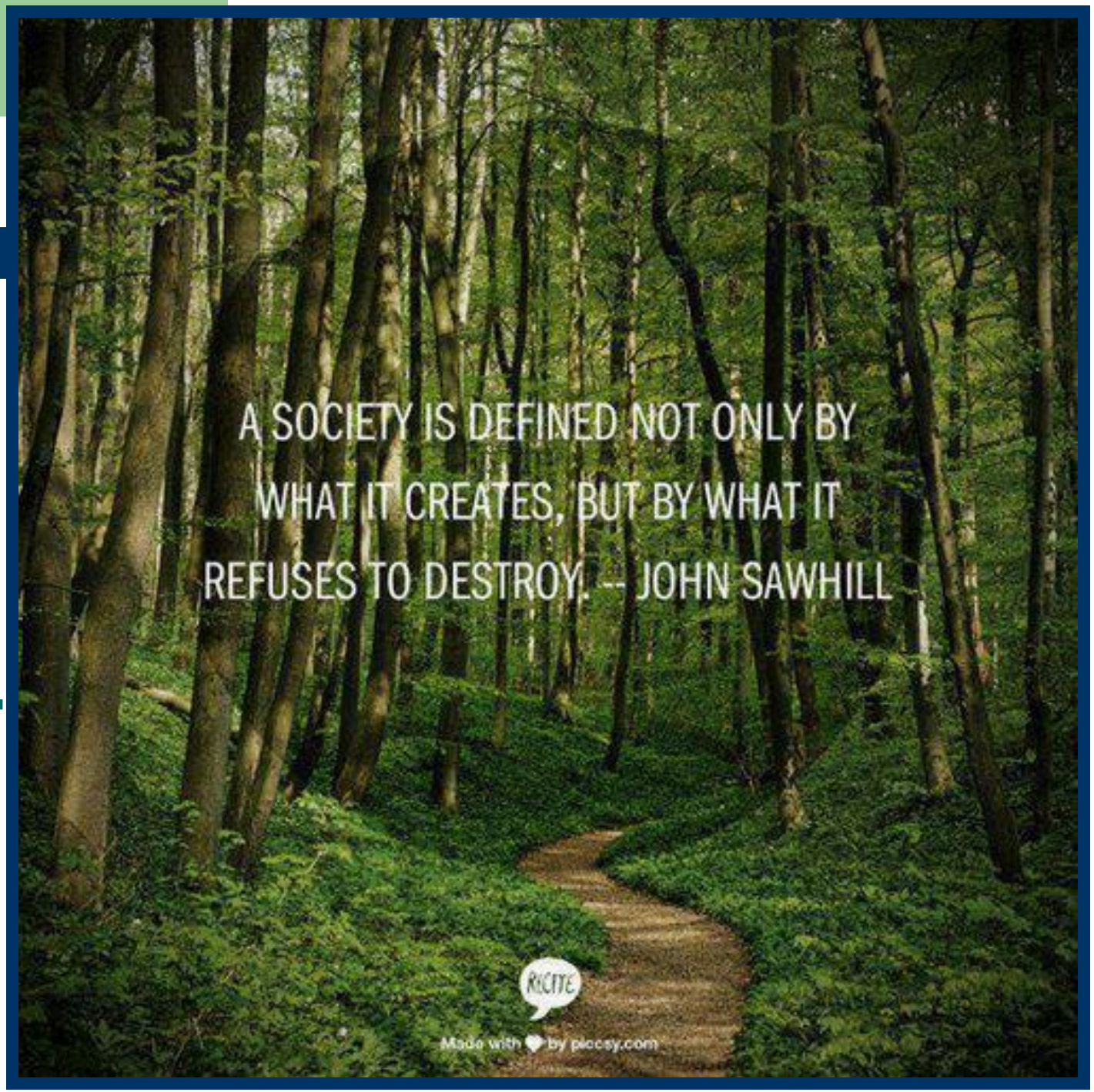
- Rachel Carson
  - Public and government
- Carl Sagan
  - Outreach efforts to popularize science
- Col. Chris Hadfield
- Me and You - from fields to classrooms to service work

Why We Do What We Do



Credit: ScienceIsAwesom

Inspirational



Humorous


Imagine If Trees Gave Off Wifi Signals, We Would Be Planting So Many Trees And We'd Probably Save The Planet Too.
Too Bad They Only Produce The Oxygen We Breathe.
VIA 9GAG.COM

Be An Advocate!!

- Research
- “Fierce champions of science in the marketplace of ideas” - Adam Frank
- Social Media
- Blogs
- School board curricula
- Science committees
- Science festivals
- Science fairs

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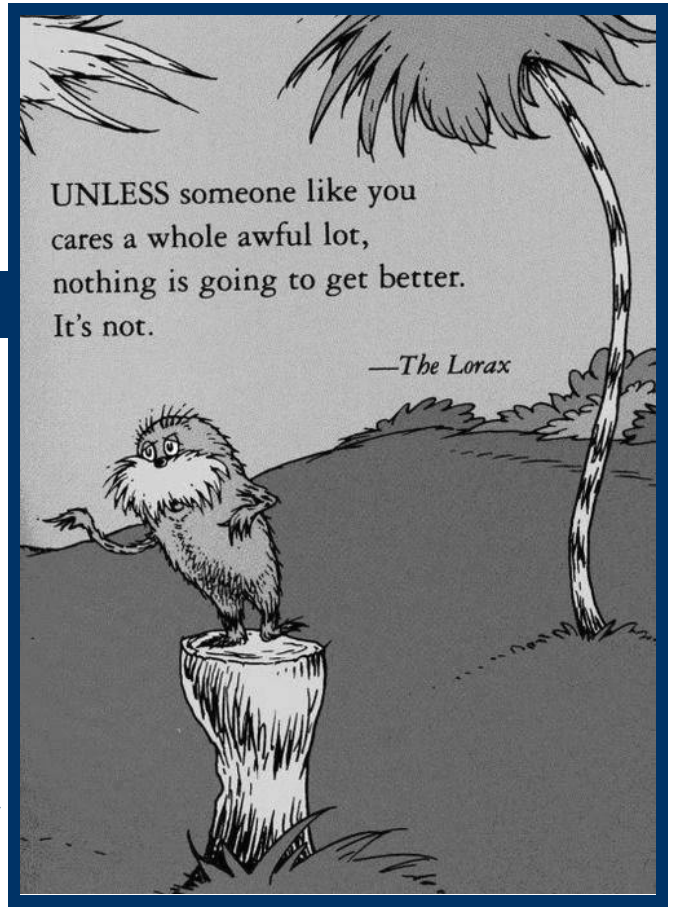

Credit: goodreads.com