

# EMPOWERING PRE-COLLEGE STUDENTS TO ENGAGE IN CLIMATE CHANGE SOLUTIONS



Dana Brown Haine, M.S., Program Director  
***Climate Leadership and Energy Awareness Program***  
UNC-Chapel Hill Institute for the Environment

This student science enrichment program is made possible with support from:



In partnership with the UNC Department of Physics and Astronomy

# Overarching Program Goals

- Improve students' **competence** in science
- Nurture students' **enthusiasm** for science
- Foster student **interest** in science-related careers



# Program Components

- One-week, non-residential summer institute
- Seven academic year activities
  - Four Saturday academies
  - Three teacher workday excursions
- Student-led community outreach project



# Proximity to Research and Industry



- **Universities**
  - UNC, Duke, NCSU
- **Research Triangle Park**
  - EPA, NIEHS, RTI
- **500+ Clean Tech Industries**



***WE NEED A WAY OF EXPLORING  
ENVIRONMENTAL ISSUES THAT IS REALISTIC AND  
HONEST, YET HOPEFUL AND INSPIRATIONAL.***

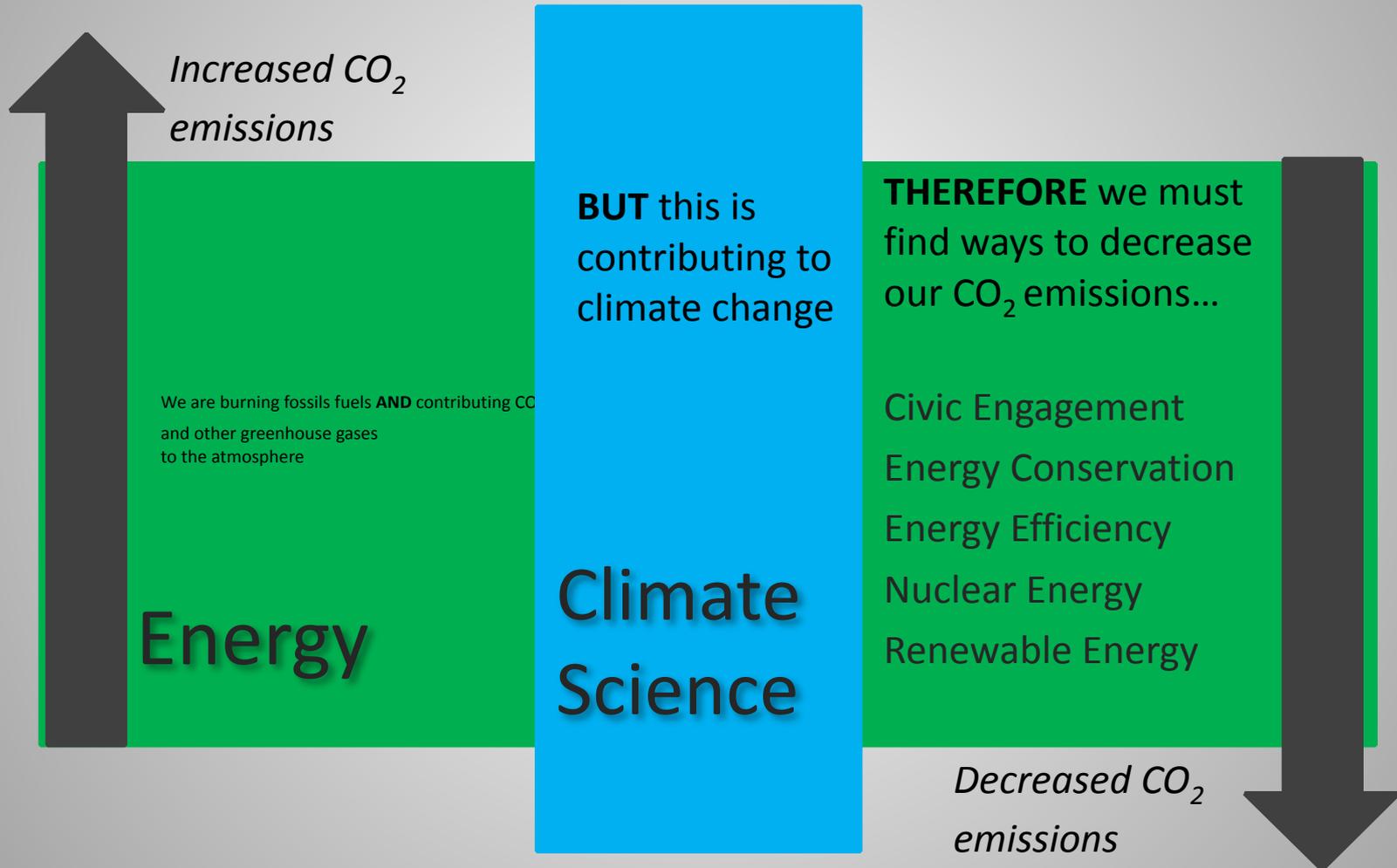
**M.G.H. Gilliam, Publisher, *Orion***

## Strategies to Empower Students To Engage In Climate Change Solutions

- Use energy story to frame climate change as a symptom of society's use of fossil fuels;
- feature scientists and engineers who are working to develop solutions to move us to a lower carbon economy;
- provide opportunities to develop science communication and leadership skills.

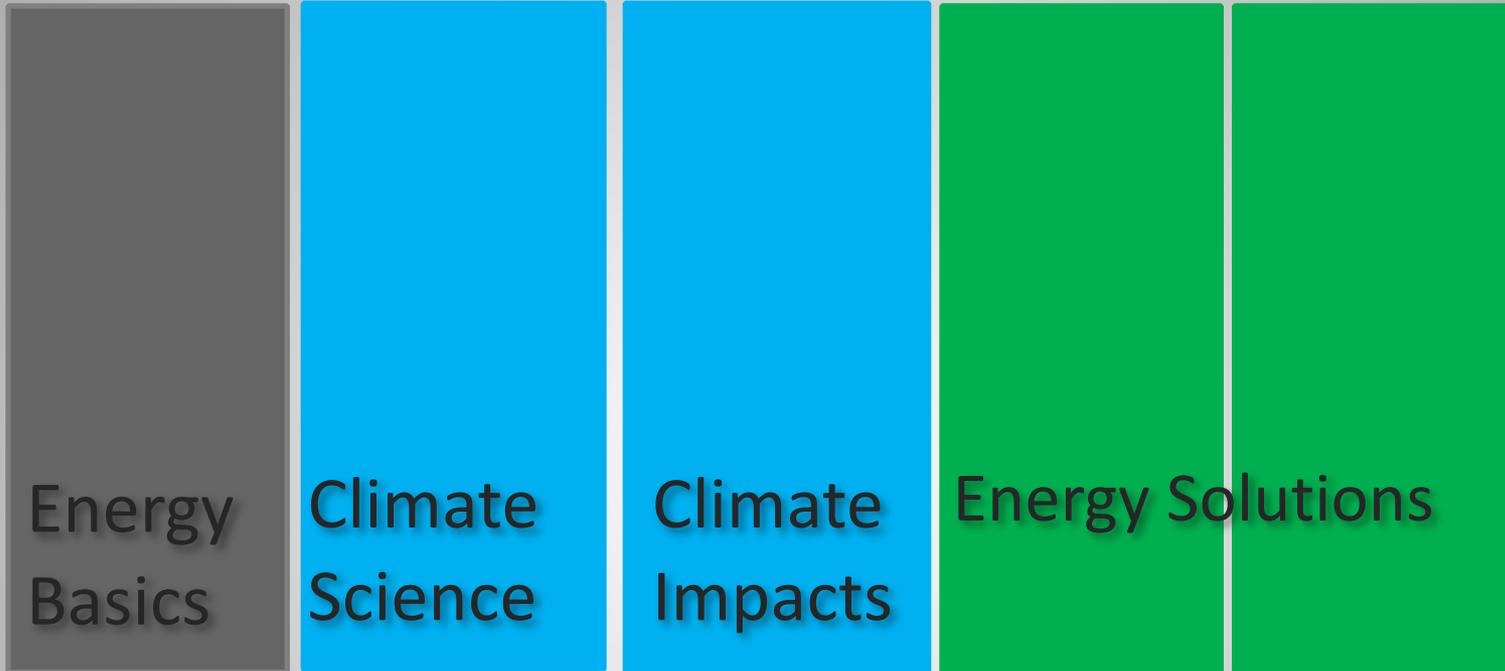
# "The And, But, Therefore of Storytelling"

- Randy Olson



# Program Content

## 5 Day Summer Institute



## Academic Year Academies



**Students engage in hands-on science enrichment activities**



# Numerous scientists directly interact with participants



Presentations  
Lab Activities  
Lab tours  
Field trips



# Program alumni serve as peer mentors



# Empowering Students To Engage In Climate Change Solutions

**126 (88%) students completed the program (2009-2011)**

- 86 (68%) completed at least one community outreach project;
- 43 (34%) participated in one or more ACE leadership trainings;
- 28 (25%) were selected to serve as Climate LEAP peer mentors.



# Inspiring Behavior Change

- A survey of program alumni (n=28) indicated that **89% of respondents were motivated by the program to make *at least one behavior change*** to conserve energy and resources in their daily life.



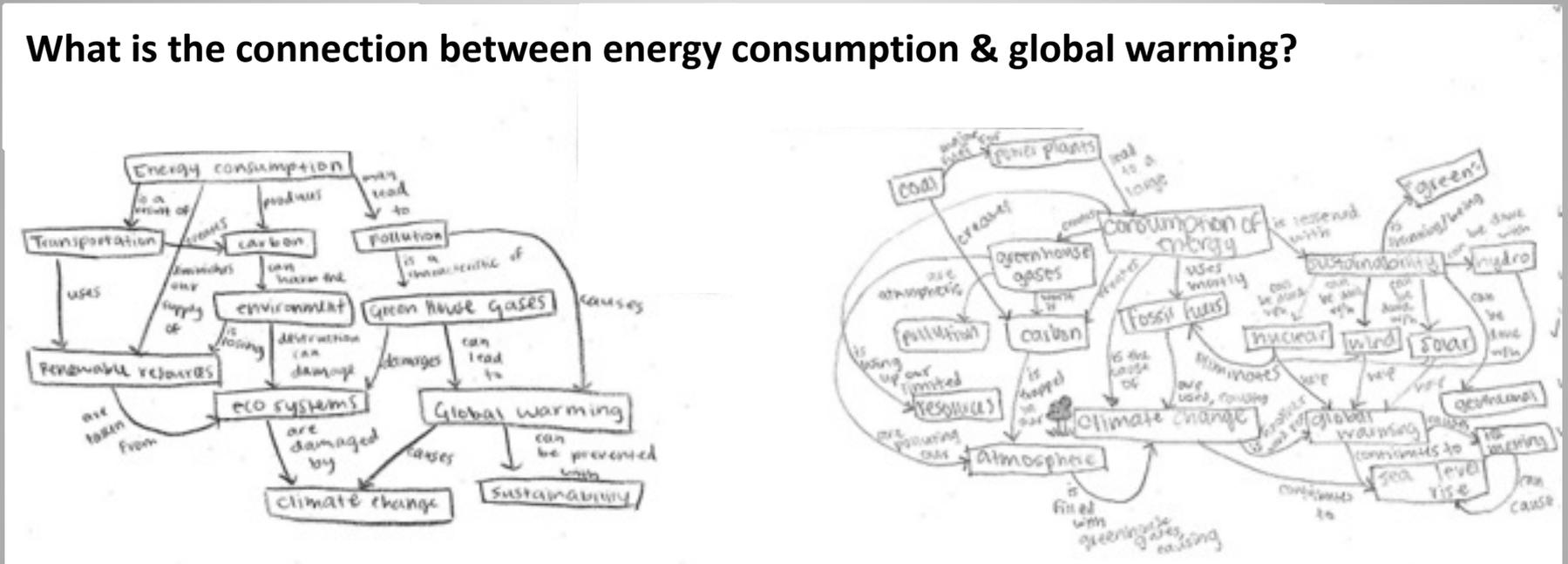
# Student reported gains in knowledge

**Table 1. Evaluation of 2011 Summer Institute: Student Knowledge and Understanding of Climate Change Science and the Solutions that Exist to Address Climate Change**

| <i>On a scale of 1 to 10, with 10 being very knowledgeable, how would you rate your:</i> | <i>Pre-Survey<br/>(n=38)</i> | <i>Post-Institute<br/>Evaluation<br/>(n=48)</i> | <i>Paired Samples<br/>t test<br/>(n=35)</i> |
|--|------------------------------|---|---|
| <i>Overall knowledge of climate change?</i>  | <b>6.41</b><br><b>(1.56)</b> | <b>8.13</b><br><b>(0.89)</b>                    | <b>p &lt;0.001</b>                          |
| <i>Overall knowledge of the various solutions that exist to address climate change?</i>  | <b>5.51</b><br><b>(1.85)</b> | <b>8.23</b><br><b>(1.12)</b>                    | <b>p &lt;0.001</b>                          |
| <i>Overall knowledge of available alternative energy sources?</i>                        | <b>6.08</b><br><b>(1.96)</b> | <b>8.25</b><br><b>(1.19)</b>                    | <b>p &lt;0.001</b>                          |

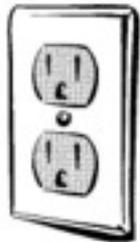
# Informal learning assessment strategies

What is the connection between energy consumption & global warming?



Pre- and Post- Concept Maps

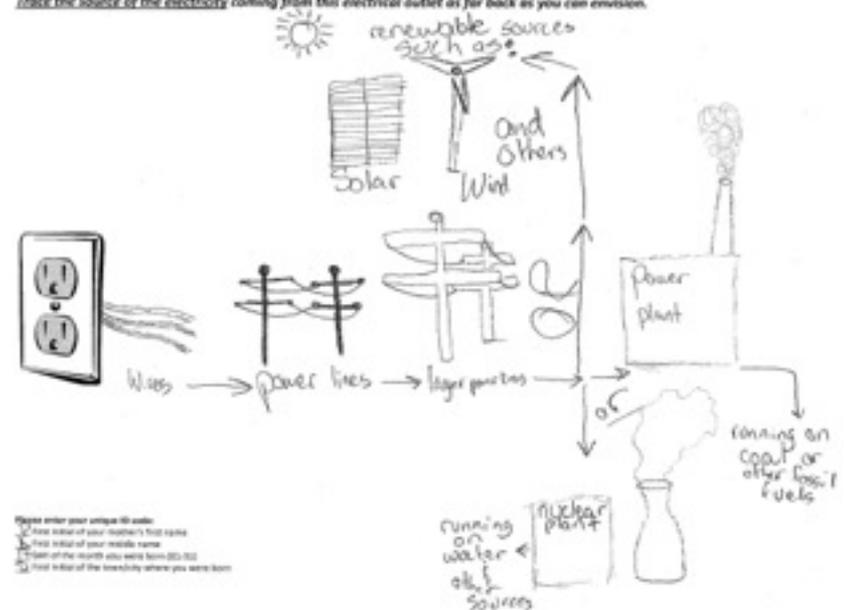
# Informal learning assessment strategies



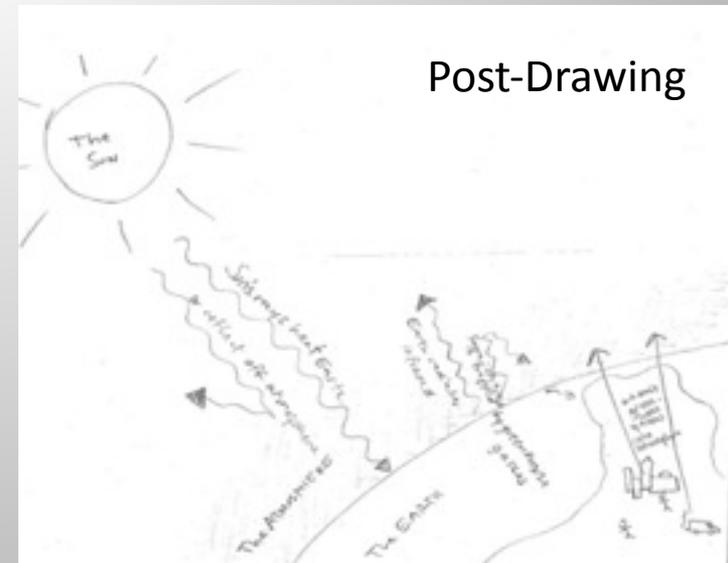
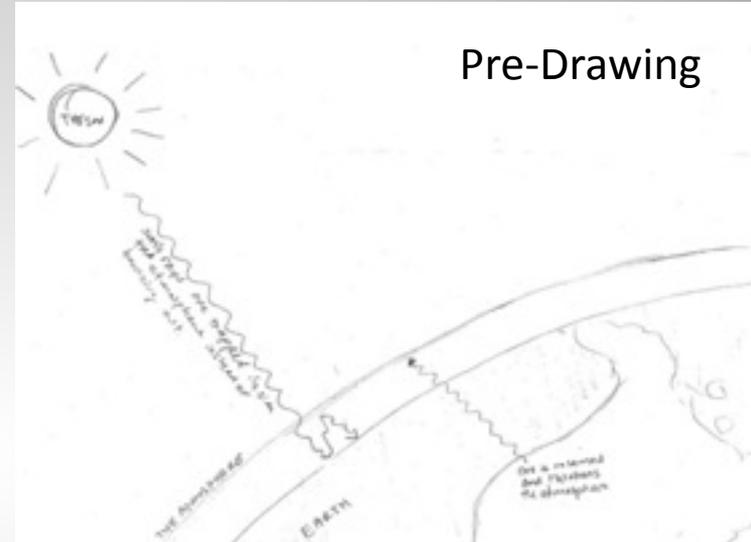
Wires go in through the wall → electrical box controls power on/off → wires eventually connect to large power lines . . . . After that it's all sort of confusing to me.

## Pre- and Post-Drawings

Trace the source of the electricity coming from this electrical outlet as far back as you can envision.



# Informal learning assessment strategies





[climateleap.unc.edu](http://climateleap.unc.edu)