



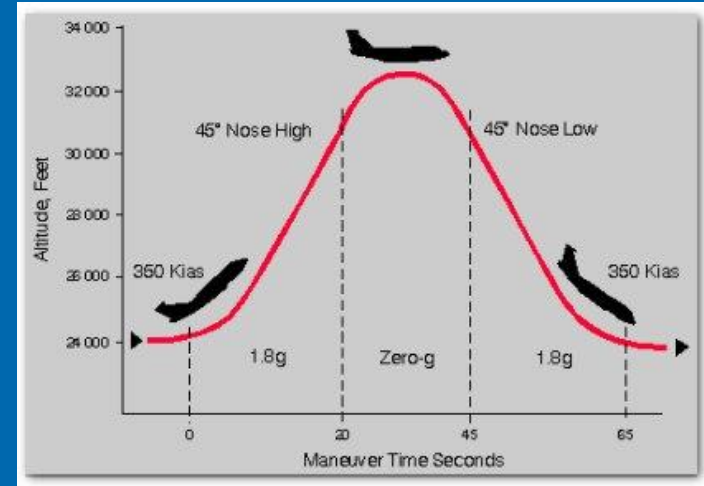
# The “Weightless Lumbees” Outreach Program

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## “Weightless Wonder”

- In existence since 1959
- Was a KC-135, then C-9, now contracted out
- Weightless environment
- ~ 20-25 seconds of microgravity
  - Lunar and Martian
- Astronaut training and “Apollo-13” movie



- Reduced Gravity Student Flight Opportunities Program
  - Since 1995
  - Full time undergraduate
  - Down to 1 flight week per year
  - Topics from fundamental science to engineering

# Our Program at UNC Pembroke

- UNC Pembroke: ~ 7000 students, primarily undergraduate, no pure science graduate programs, southeast region of the state
- Began as a joint venture between the Dept. of Chemistry & Physics at UNC Pembroke and the School of Engineering at UNC Charlotte in 2002
- To date, we have had 6 of 7 proposals accepted for flight
- I serve as the overall advisor, have had other faculty working with the team on specific experiments
- Use of non-technical majors taps into additional skills set of those outside typical disciplines
  - Education, Public Relations, Mass Communications, Business, Nursing, Physical Therapy



# Our Program at UNC Pembroke

- Proposal (Due in October)
  - Student's idea for experiment
  - Full proposal with:
    - Justification (Why is NASA interested?)
    - Experiment
    - Equipment
    - Budget
    - **Outreach (25%)**
    - Support letters
  - Submitted to NASA and reviewed by science, engineering, and program officials
  - Acceptance announced in December
  - Flight in summer



# Our Program at UNC Pembroke

## ➤ Projects

### ➤ Usually perform two experiments

#### ➤ One formal investigation

#### ➤ One outreach experiment -- "gee-whiz"

### ➤ Due to the nature of our department, experiments have typically been in the areas of fluids and biochemistry.

#### ➤ Diffusion (learned experiments don't always work)

#### ➤ Antigen/anti-body process

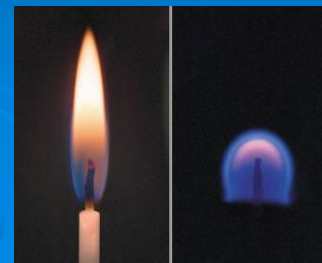
#### ➤ Enzyme/substrate reaction rates

### ➤ Outreach experiments have been typical physics demonstrations with the interesting twist of being performed in 0-g.

#### ➤ Balls in a viscous fluid

#### ➤ Candle flame

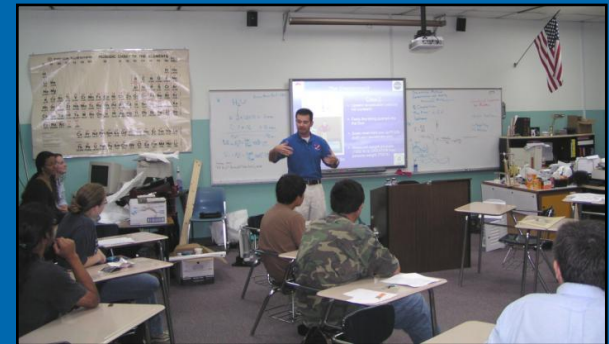
#### ➤ Oil & water

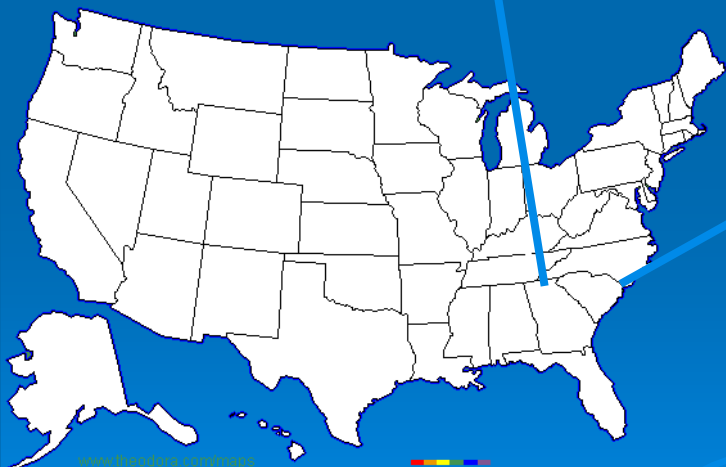
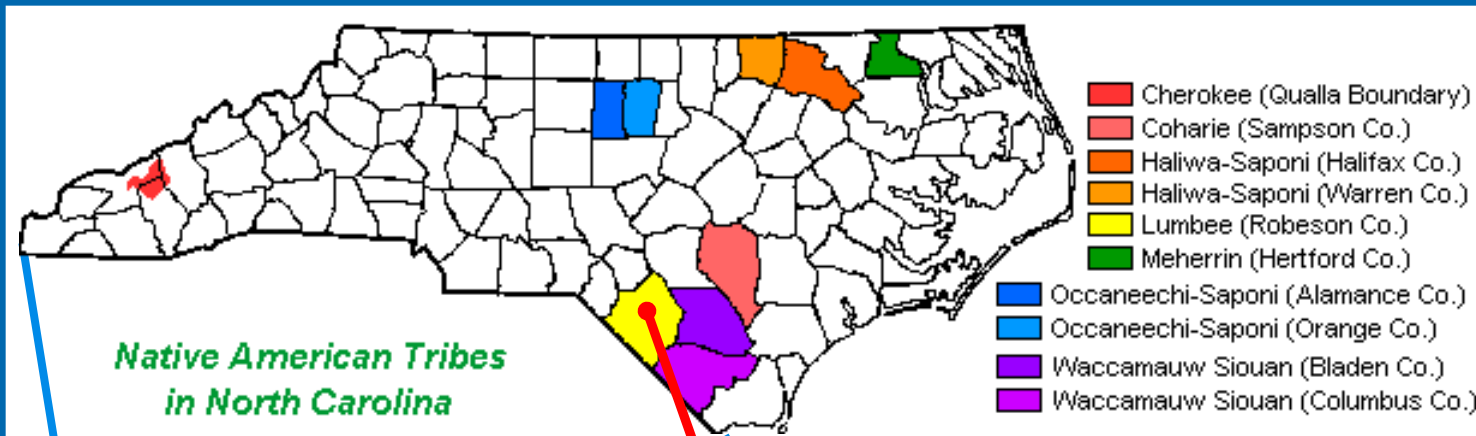


- Stimulate an interest in science in youth across North Carolina
- 25% of proposal score based on outreach program
- Students must think about how to present their work to different levels of non-science audience
- Students usually “discover” how much they enjoy talking to youth



- Schools, NC Museum of Natural Sciences, education centers, youth programs, science fairs, web page, brochures, stickers, etc.
- Conducted throughout the calendar year
- Even conducted during years NOT participated in RGSFOP
- Special meaning, a way to give back to local youth and serve as role models
  - American Indian students speaking to American Indian students





- UNC Pembroke in Robeson county
- Robeson County (50k+ American Indian)
  - 40% American Indian
  - 25% African American
  - > 40% no high school diploma



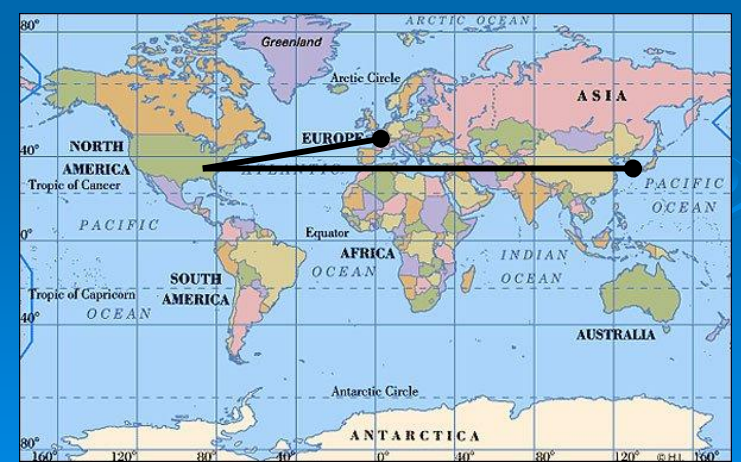
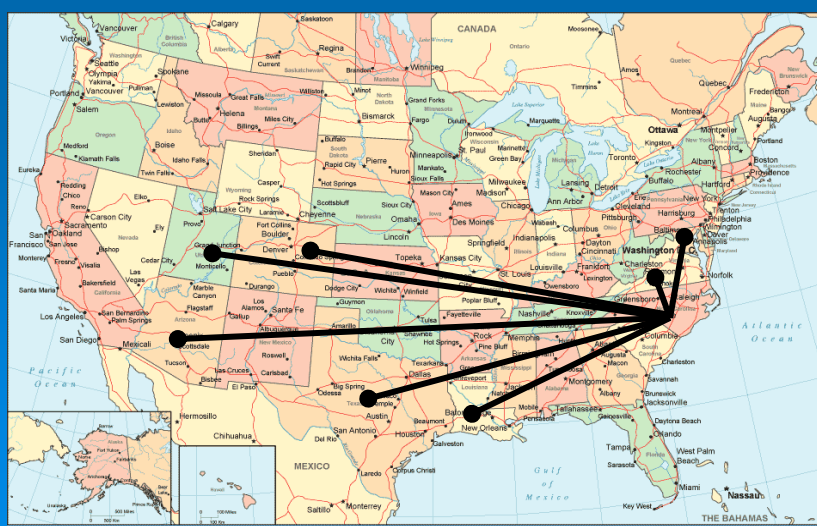
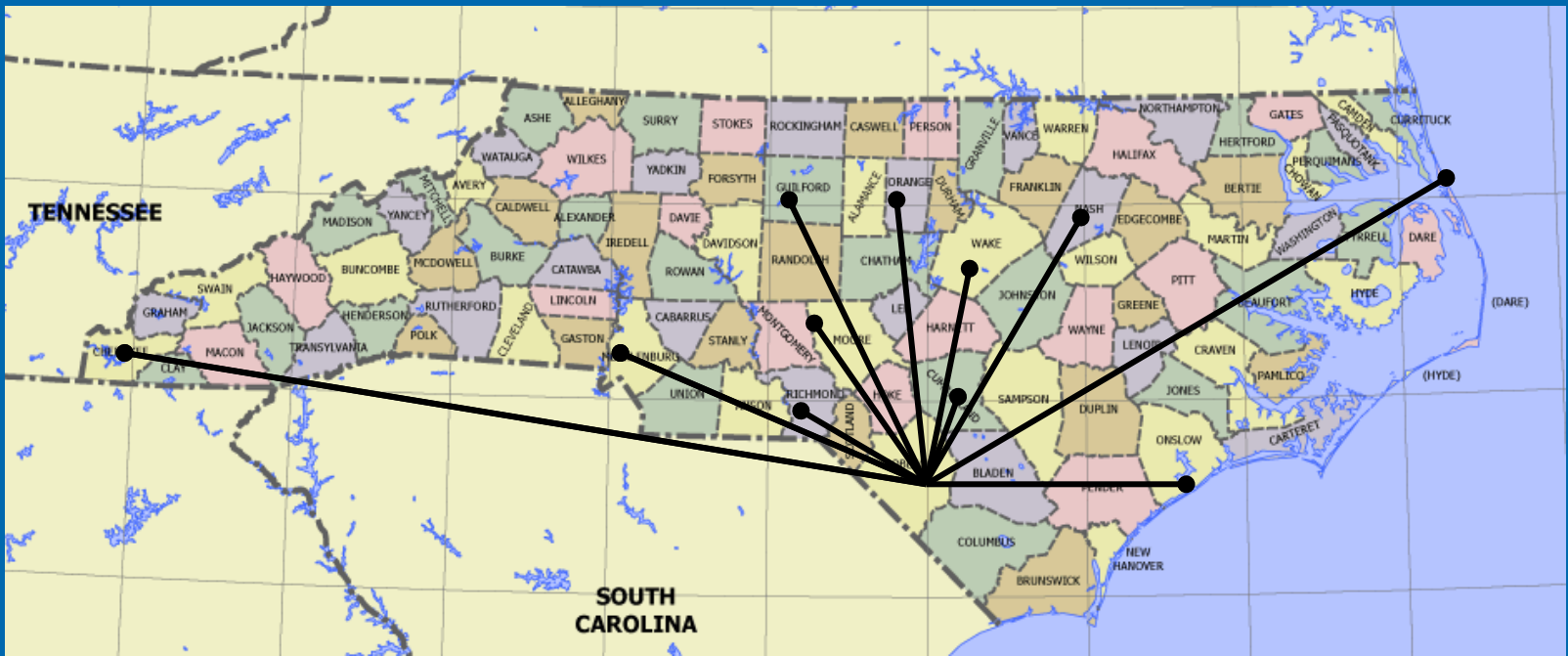


- Power Point
  - Density, Floating, Weightless Wonder, etc.
- Includes hands-on
- Kids (audience) perform the 1-g experiments



- Questions on fluid response in 0-g
- Video from flight to answer questions
- Outreach "package"

# Previous Outreach Locations



- NASA's Reduced Gravity Student Flight Opportunity Program
- North Carolina Space Grant Consortium
- UNCP Health Careers Opportunities Program (HCOP)
- Administration and staff of UNCC and UNCP for their help and financial support
- The North Carolina Biotechnology Consortium
- American Indian Science & Engineering Society (AISES), UNCP chapter
- Navy and Marine Corps Reserve Center in Charlotte, North Carolina
- Families of the team members.
- Other advisors: Dr. Siva Mandjiny (UNCP), Ms. Kathy Nunnally (UNCC), Dr. Howard Phillips (UNCC), Dr. Brain Postek (UNCP), Dr. Greg Watkins (UNCC), and Ms. Teresa Williams (NASA).

