Vietnam Climate Change Education

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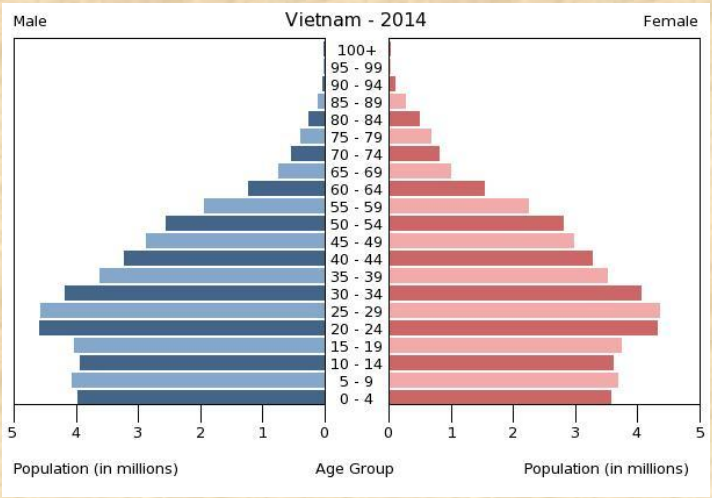
Vietnam by the numbers

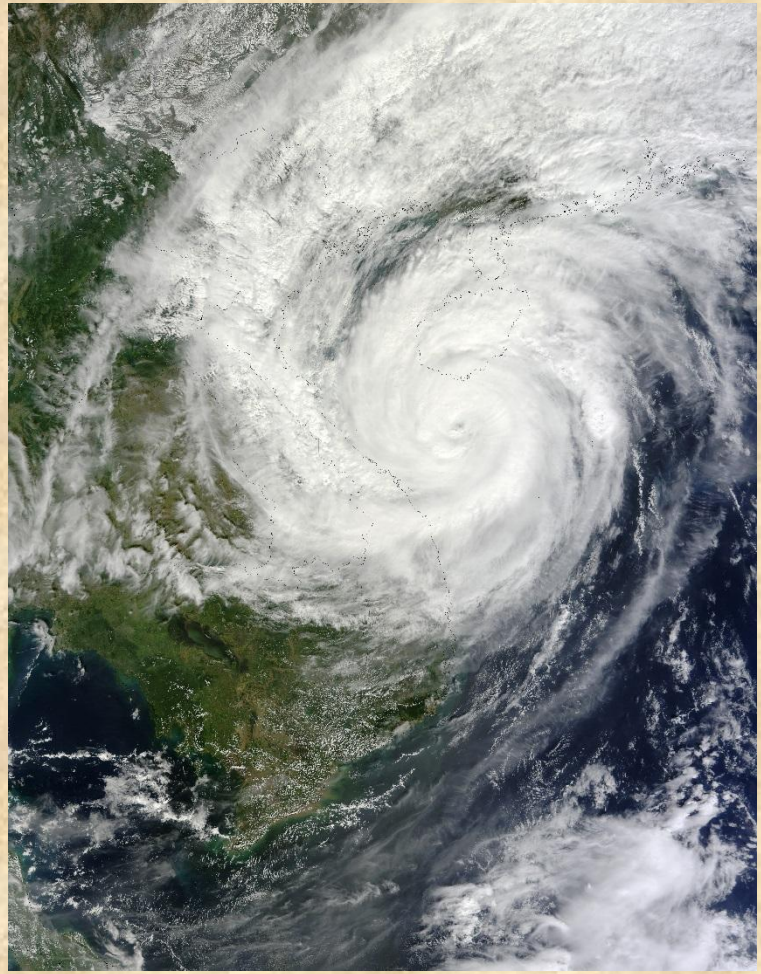
- Slightly larger than New Mexico
- 3,444 km of coastline
- Tropical in south, monsoonal in north
- Low, flat deltas in south, central highlands, and mountainous in the north
- Typhoons May to January with extensive flooding in the Mekong
- Logging and slash/burn agriculture contribute to deforestation and soil erosion
- Water pollution and overfishing
- Growing urban development and population migration into Hanoi and Ho Chi Minh City

Vietnam by the numbers



- Population: 93 million
- 54 Ethnic groups
- 31% urban
- 93.4% literacy rate
- 58 provinces, 5 cities
- Rice, coffee, rubber, tea, pepper, soybeans, cashews, sugar cane
- Industries – food processing, garments, shoes (U.S. large importer of goods)
- 1.3% unemployment

Typhoon Haiyan: Unusual?



Storm trends

8-10 tropical storms per year

Coastal Vulnerability

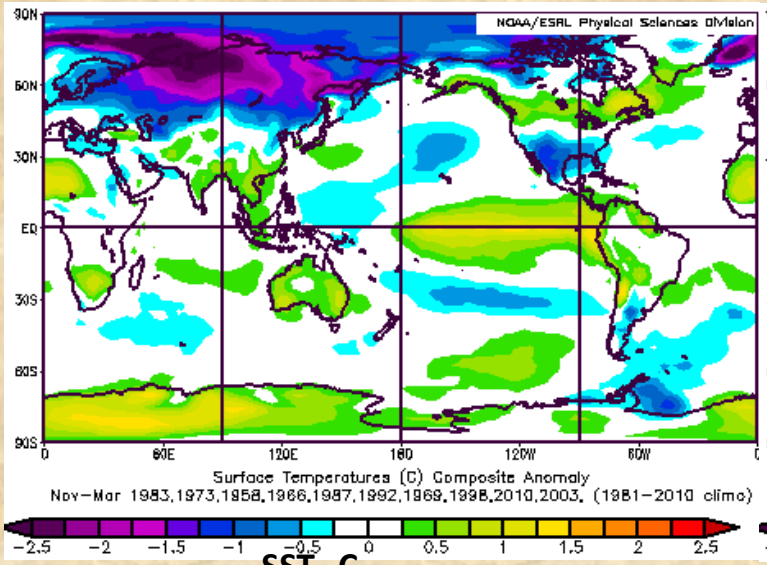
- Increasing Storm Intensity
- Storm Surge & Flooding
- Salt Water Intrusion
- Sea-level change

More/Longer Heat Waves

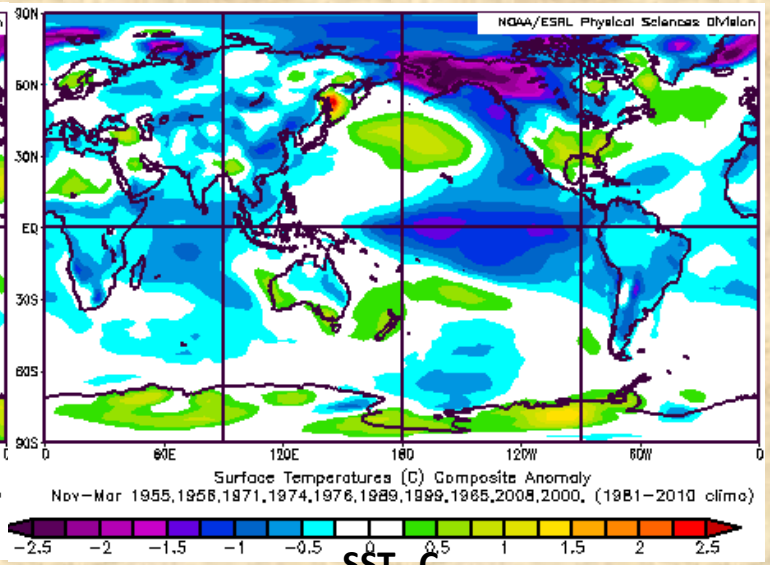
Snow Event in Northern Vietnam

Sea surface temperature anomalies for El Niño (dry) and La Niña (wet) conditions

El Niño



La Niña



Drought

Flood

Recognizing the climate challenges

- “Across Vietnam people have noticed changes in climate and to their local environments.”
  - “Vietnam: Climate Asia Report”, Tan Copsey, Yen Nguyen and Phuong Ha Pham, UK Department of International Development, 2013
- Vietnam has made strong commitments to respond to the coming challenges of climate change and has begun to implement programs to cope with the impacts.

Plan of Action

- New courses at Ho Chi Minh Academy of Politics and Public Administration, the leadership training center for the Communist Party of Vietnam
- Provincial Leadership training
- Outreach to families via formal education system

Knowledge, Attitude, Practice

- Survey in 2013 of 20 government departments in 3 provinces, Thanh Hoa, Nam Dinh and Nghe An with a sample size of 411 leaders and Communist party officials.

Survey Results…..

- Noted changes in air temperature, storms, and flood/high tide.
- Underestimate the impact of climate change to agriculture production, fisheries, and food security.
- Did not know that CC could bring opportunity for people through strategies such as Green Growth.
- Top priorities for next 5 years include “increase capacity and understanding” of climate change adaptation and mitigation
- Those who participated in previous climate change trainings/ workshop applied the knowledge to their work, indicating training is essential for climate change adaptation planning.

Proposed 5-day in-service for all Provincial Leaders

- Development of communities of practice
- Learning outcomes included climate science basics, climate vulnerability, disaster risk reduction, coastal resilience, opportunities for local economy, agriculture, and ecosystems.
- Informed by international reports and best practices
- Considerations from evaluation results from previous SE Asia training through USAID/LEAF (Lowering Emissions in Asia's Forests)

LEAF Evaluation Results

- Provide active participation and discussion opportunities
- Materials that do not assume prior knowledge about climate science or climate change
- Opportunities for participants to describe their own observations and experience
- Clear, prioritized content for the audience with references
- Specific information on local climate change consequences including case studies
- Clear, actionable takeaways
- Information to distinguish between extreme weather events and climate change
- Information/discussion about opportunities for innovation, technology solutions, and economic growth
- An emphasis on the importance of climate change on agricultural activities and potential responses to climate change implications
- Information about the roles of forest and mangroves in climate change to reduce erosion, wave strength and the role of coastal wetlands in carbon sequestration

National Search for Trainers

- Experienced local university professors
- Effective communicators, team player
- Previous experience in teaching climate science to adults
- Core group met to revise suggested presentations and activities and translate all materials into Vietnamese
- Practice sessions at U.S.Embassy in Hanoi with invited university students.

Development of New Materials, adaptation of U.S. Materials

- Presentations and learning strategies from U.S. climate education efforts
  - Carousel Brainstorming
  - Small group discussion
  - Interactive simulations
  - Presentations with imbedded questions
  - Hands-on activities

Carbon Pathways Simulation

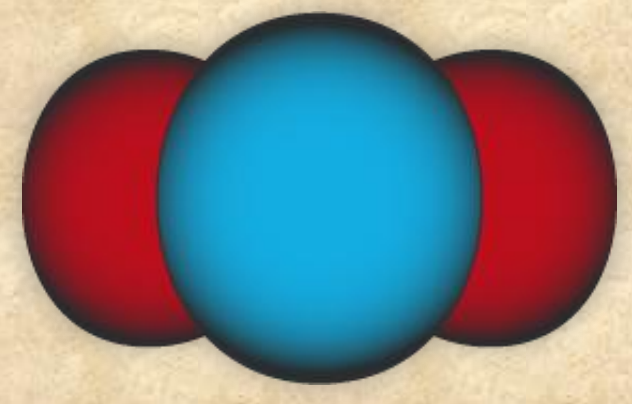
- You will need a partner. One will have a white pipecleaner (pre-industrial age) and one will have a green one (post-industrial age).
- You are not a human now, you are a carbon atom in Earth's systems. You will go to the set of tables that are marked pre or post industrial and depending on the roll of dice you will travel to one of these places:

  Hydrosphere

  Biosphere

  Atmosphere

  Lithosphere



- Record each place that you visit and collect a bead from that place and string it on your pipecleaner.
- After 10 rounds, compare your length of beads with that of your partner.
- We will discuss in small groups your findings.

Climate Adaptation Simulation

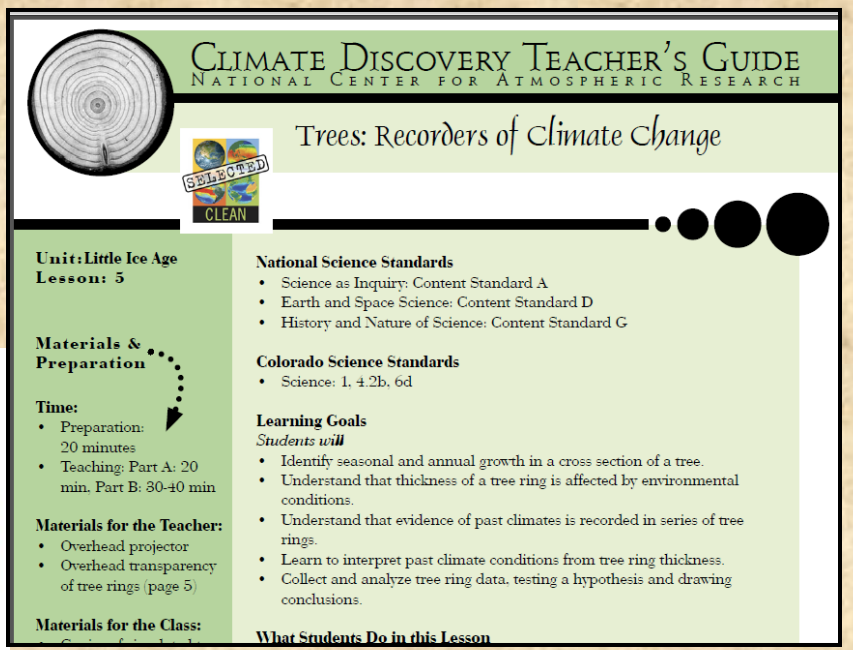
- *Beat the Uncertainty* – adaptation strategies for coastal resilience
- Adapted from successful mitigation simulation from Max Planck Institute for Human Development with the creators Tarlise Townsend and Astrid Kause
- Piloted at the Hanoi Embassy American Center with 90 university students

HARDING CENTER FOR RISK LITERACY

Discussion Questions

1. Based on your prior experience and insight from the game, where are Thanh Hoa's strengths and weaknesses in climate resilience?
2. Are there resilience (adaptation) measures that pose challenges to implementation in Thanh Hoa?
3. How do these challenges compare to the benefits of the measure?
4. Are there strategies for combating these challenges?
5. Do some resilience measures seem to have a wider range of benefits than others?

Proxy data Activity: Trees, Recorders of Climate Change



CLIMATE DISCOVERY TEACHER'S GUIDE
NATIONAL CENTER FOR ATMOSPHERIC RESEARCH

Trees: Recorders of Climate Change

SELECTED
CLEAN

Unit: Little Ice Age
Lesson: 5

Materials & Preparation

Time:
- Preparation: 20 minutes
- Teaching: Part A: 20 min. Part B: 30-40 min

Materials for the Teacher:
- Overhead projector
- Overhead transparency of tree rings (page 5)

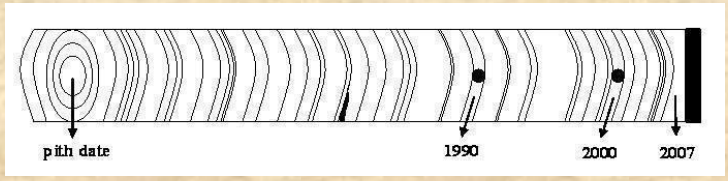
Materials for the Class:

National Science Standards
- Science as Inquiry: Content Standard A
- Earth and Space Science: Content Standard D
- History and Nature of Science: Content Standard G

Colorado Science Standards
- Science: 1, 4.2b, 6d

Learning Goals
Students will
- Identify seasonal and annual growth in a cross section of a tree.
- Understand that thickness of a tree ring is affected by environmental conditions.
- Understand that evidence of past climates is recorded in series of tree rings.
- Learn to interpret past climate conditions from tree ring thickness.
- Collect and analyze tree ring data, testing a hypothesis and drawing conclusions.

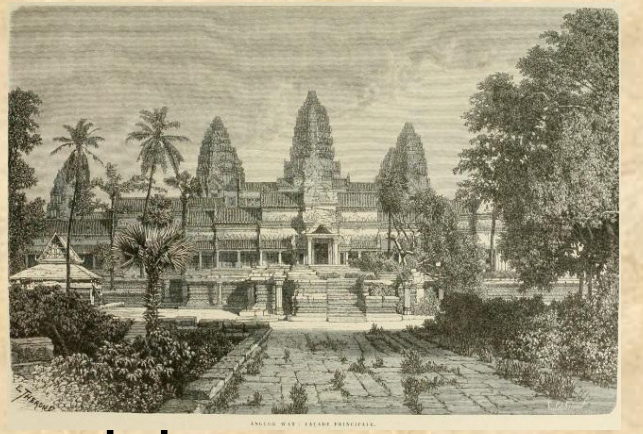
What Students Do in this Lesson



Fokienia hodginsii

Tree ring evidence from cypress in Vietnam's highlands

Climate change and the Angkor civilization



- Decades-long drought impacted the city's water supply and agricultural productivity
- Abrupt reversals from drought to intense monsoon
- High-magnitude monsoon years damaged water control structures that were extensive and interdependent

Revised one-day agenda

- Weather, climate and climate variability
- Natural and human-induced contributions to climate change
- Role of greenhouses gases on Earth's climate system
- Past, present, and projected future concentrations of greenhouse gases and emissions scenarios on Earth's climate system
- Consequences of a warming world
- Sources of information about climate change scenarios and climate prediction tools used for Vietnam and its provinces.
- Key components of climate vulnerabilities and adaptation
- Potential opportunities for the local economy, agriculture, and ecosystems due to climate changes (green growth, climate proofing)
- Determine training needs for Provincial and local community members

Workshop Results

- The difference between climate and weather
  - Pre training: 44% little or no knowledge
  - Post training: 98% know and know well
- The identification of climate change causes
  - Pre training: 48% little or no knowledge
  - Post training: 95% know and know well
- The impact of rising greenhouse gases
  - Pre training: 88% little or no knowledge
  - Post training: 73% know and know well
- The impact of changing climate on Vietnam
  - Pre training: 74% little or no knowledge
  - Post training: 74% know and know well

Workshop Results

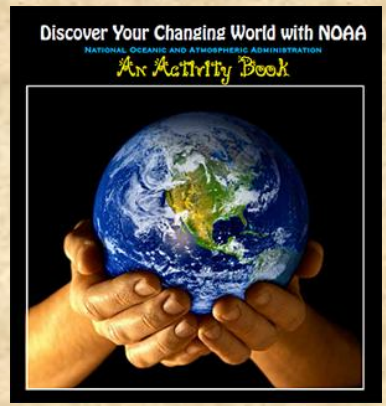
- Key factors in climate change vulnerability
  - Pre training: 74% little or no knowledge
  - Post training: 83% know and know well
- Opportunities related to climate change for their local area (Green Growth)
  - Pre training: 71% little or no knowledge
  - Post training: 86% know and know well

86% thought that the training met their expectations

100% believed that the training is necessary.

Presentation to Vietnam Institute of Educational Sciences

- Explanation of Climate literacy
- Closing the gaps in climate literacy through formal, informal, outreach, citizen science projects
- Focus on professional development
- Sample products, projects, web resources



Future Training

- Expand # trainers
- Additional training opportunities tailored for provinces and audiences (technical, business, government)
- Increase use of interactive strategies and simulations
- Increased efforts in climate adaptation and disaster risk reduction focused at primary schools to reach families

Next Steps

- Complete English and Vietnamese versions of climate adaptation simulation
- Revise Games.noaa.gov to highlight climate games and simulations from many partners
- Sponsor Climate Game Jam in 2015

President Obama at the Young Southeast Asian Leaders Intitiative Town Hall, April 27, 2014

“You have to be a part of the solution, not part of the problem. You have to say, this is important . . . You don’t have to be a climate science expert, but you can educate yourselves on the issue. You can discuss it with your peer groups. You can organize young people to interact with international organizations. You can help to publicize it. You can educate your parents, friends, coworkers. “

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