The Working CORE: Working in a Community of Outreach Research Experiences

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Mission Statement and Goals – Center for Earth System Education

- Encourage, support, and promote Earth System Education at all levels
- Infuse NOAA, other agency science education materials/tools to urban ecosystem natural hazards
- "Round Table Earth" as community networking focal point for communications
- Research and Education outreach activities for middle and high school students
- Capacity building through internal/external liaisons and partnerships
- Promote interaction with public through various media for hazardous weather conditions

Observations

Purpose – Examine environment to define characteristics, properties, & behaviors

Typical Example – the Urban Heat Island Effect

- Eight million people & varying weather conditions
- Quantification of effect, impacts, & applications

Education & Awareness –

- Green buildings, vehicles, appliances,
- Urban, suburban, rural environments; interactions

Research & Outreach –

- Determine emissions and measure thermal variations
- Apply remote sensing tools, analytic techniques

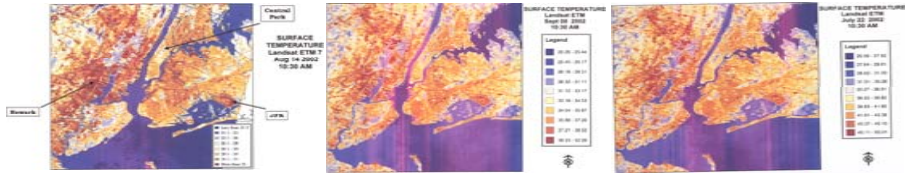
*** Urban System Awareness ***

Heat Wave- Prolonged period of excessive heat, often combined with excessive humidity.
Heat Index - A number in degrees Fahrenheit (F) that tells how hot it feels when relative humidity is added to the air temperature. Exposure to full sunshine can increase the heat index by 15 degrees.
Heat Cramps- Muscular pains and spasms due to heavy exertion. Although heat cramps are the least severe, they are often the first signal that the body is having trouble with the heat.
Heat Exhaustion - Typically occurs when people exercise heavily or work in a hot, humid place where body fluids are lost through heavy sweating. Blood flow to the skin increases, causing blood flow to decrease to the vital organs. This results in a form of mild shock. If not treated, the victim's condition will worsen. Body temperature will keep rising and the victim may suffer heat stroke.
Heat Stroke - life-threatening condition. The victim's temperature control system, which produces sweating to cool the body, stops working. The body temperature can rise so high that brain damage and death may result if the body is not cooled quickly.
Sun Stroke - Another term for heat stroke.

*** Action-Oriented Responses ***

What you should do if the weather is extremely hot:

- Stay indoors as much as possible and limit exposure to the sun.
- Stay on the lowest floor out of the sunshine if air conditioning is not available.
- Consider spending the warmest part of the day in public buildings such as libraries, schools, movie theaters, shopping malls, and other community facilities. Circulating air can cool the body by increasing the perspiration rate of evaporation.
- Eat well-balanced, light, and regular meals. Avoid using salt tablets unless directed to do so by a physician.
- Drink plenty of water. Persons who have epilepsy or heart, kidney, or liver disease; are on fluid-restricted diets; or have a problem with fluid retention should consult a doctor before increasing liquid intake.
- Limit intake of alcoholic beverages.
- Dress in loose-fitting, lightweight, and light-colored clothes that cover as much skin as possible.



Analysis

Examination reveals…

- NYC regions and Newark are warmer than the outside of NYC
- NYC surface temperature for the day and night have the same degree of warmth.
- Newark, JFK, & LGA have warmer than 31 degrees C
- Central Park is cooler with 23.1 to 28 degrees

Diagnosis

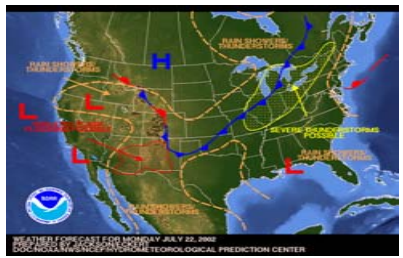
Conceptual Model

Prediction

- Research focuses on components in terms of properties, behaviors, processes, and interactions as applied to urban ecosystem settings
- Includes impacts of ecosystem on people and vice versa
- Provides consideration of avoidance, mitigation, and prevention
- Requires observations, analysis, diagnosis, conceptual model development and prediction (or forecasting) based on system knowledge & measurement
- Curricular guidance available for middle and high school levels as linked to science standards locally or nationally

Air Quality Index for Ozone

Index Values (Conc. Range)	Air Quality Descriptors	Cautionary Statements for Ozone
0 – 50 (0-60 ppb)	Good	No health impacts are expected when air quality is in this range.
51 – 100 (61-75 ppb)	Moderate	Unusually sensitive people should consider limiting prolonged outdoor exertion.
101 – 150 (76-106 ppb)	Unhealthy for Sensitive Groups	Active children and adults, and people with respiratory disease, such as asthma, should limit prolonged outdoor exertion.
151 – 200 (107-115 ppb)	Unhealthy	Active children and adults, and people with respiratory disease, such as asthma, should avoid prolonged outdoor exertion; everyone else, especially children should limit prolonged outdoor exertion.
201 – 300 (116-374 ppb)	Very Unhealthy	Active children and adults, and people with respiratory disease, such as asthma, should avoid all outdoor exertion; everyone else, especially children, should limit outdoor exertion.



WHO? – YOU!

Wonders & Hazards to Observe – by You!

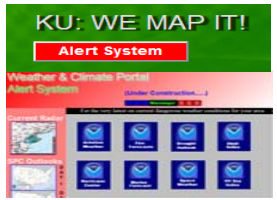
- ❖Roundtable Earth – Awareness
- ❖Teacher Workshops – Pedagogy
- ❖Educational Sessions – Content

FFRA Grant – Provides funding for current academic year for the establishment of a new website and outreach program to K-12 teachers, particularly middle and high school

The Kean University Institute for Urban Ecosystem Studies (IUES) – Provides a resource of scientists across disciplines who observe, monitor, assess, study, and model Earth System behaviors, phenomena, & hazards

Outcomes/Deliverables – Deliverables include:

(1) Website integration of NOAA & other resources
(2) Teacher workshop (NJESTA Conference)
(3) Roundtable Earth (Establish Program)
(4) Educational sessions (Incorporate teachers)



Topics for Research

- Urban Ecosystem emphasis, NJ region
- Extremes of rainfall, temperature, winds
- Frequency of storms, winter/summer, severe weather (hail, tornado)
- Local phenomena (sea breeze, valley wind)

"WHERE UR in New Jersey!"

- Weather Hazard Education & Research for Ecosystems of Urban Relevance in New Jersey

Goal #1 – Establish student-assisted education and research outreach activities through the Earth System Science approach and opportunities via Kean University's CESE, using NOAA and other resources, through new and existing Kean University partnerships to serve the urban ecosystem communities and K-12 interests of New Jersey.

Goal #2 – Conduct student-centered cooperative and joint research and collaborative education ventures with state and federal government agencies and the private sector to observe, diagnose, model, and predict hazardous weather and its impacts on New Jersey urban ecosystems through the Earth Systems Science approach.

- Partnerships with middle/high school student researchers
- Internal and external partnerships including private/commercial sectors and other communities; university-level; and agencies
- Media & Public interactions for safety, training, research, and community preparedness with undergraduate students as liaisons

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