



# GLOBE in the University

- examples of GLOBE infusion in University Environmental Studies and Science Education

@ Southern Connecticut State University

*ENV 350 : Environmental Systems Inquiry -  
undergraduate*

*SCE 575: Integrated Science Experiences -  
graduate*






*ENV 350 : Environmental Systems Inquiry - undergraduate*

*SCE 575: Integrated Science Experiences - graduate*

These courses examine local, regional and global environmental phenomena using an earth systems science approach.

For undergraduates, the course is an introduction to GLOBE and to Environmental Systems.

For graduates, the course is an exploration of GLOBE in teaching environmental science; pedagogical content knowledge and science conducted outside of classrooms.

Events and issues are studied through inquiry, field studies and group collaborative research - “jigsaw” strategies. 



Topics include environmental field studies, site descriptions and monitoring, data collection (weather, hydrology, soils and biometry | employing GLOBE Program Protocols).



A Systems Analysis approach - including “jigsaw groups” - examines environmental phenomena and events affecting atmosphere, hydrosphere, biosphere and geosphere.







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Earth Systems Science  
interacting "spheres":  
processes & phenomena

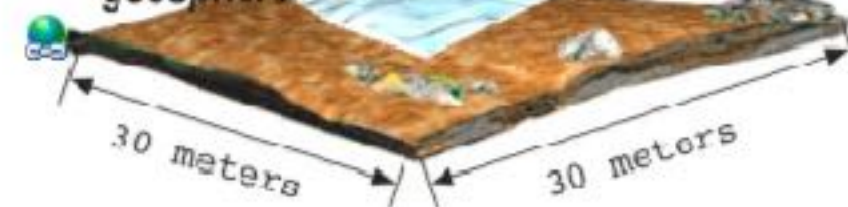
atmosphere

anthrosphere

biosphere

hydrosphere

geosphere





## *ENV 350 : Environmental Systems Inquiry - undergraduate*

### *SCE 575: Integrated Science Experiences - graduate*



Participants will work together to explore local field sites and characterize a study site by collecting and analyzing atmospheric, hydrology, soils and biometric data (land cover biology).



Specific processes associated with Earth-Environmental "Spheres" will be highlighted with examples of significant "events" (e.g. hurricanes, deforestation, ice-shelf disintegration and climate change). Strategies for analyzing these events, their effects on the landscape, seascape, atmosphere and biology will be explored.

Natural processes at work within and across the system of spheres will be analyzed, particularly with respect to "event"-driven interactions.

Event and Sphere inquiry will comprise 2-week modules that begin with an overview of the sphere of choice/ assigned with particular emphasis on the phenomenon/ event in question. The second week's activity for each module involves generating an analysis of sphere-event interactions.





**Jigsaw groups | for collaborative inquiry...**





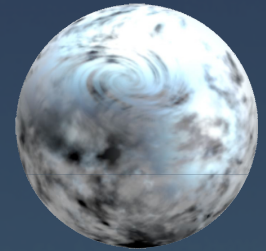
**Learners are assigned to a “sphere group”.**



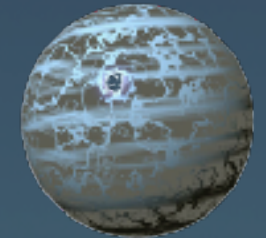
**Sphere group members will work collaboratively to identify and describe an event’s impact on their particular sphere.**



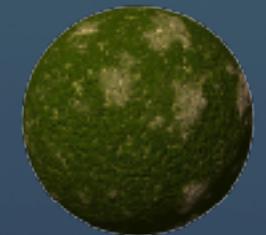
***atmosphere***



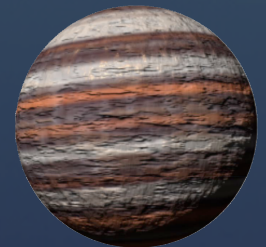
***hydrosphere***



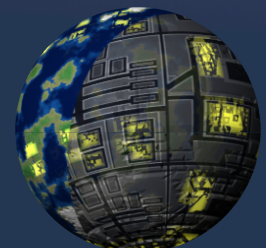
***biosphere***



***geosphere***

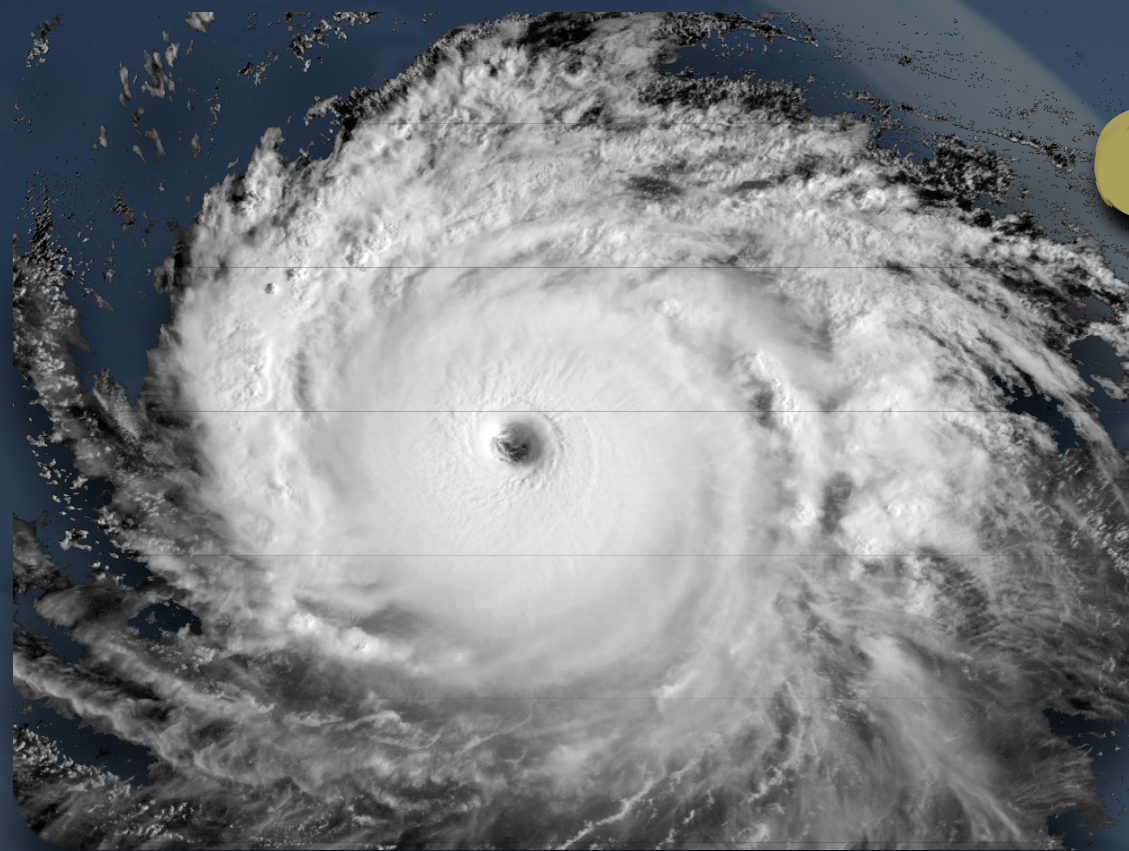


***anthrosphere***

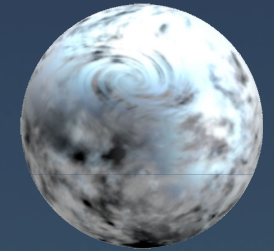




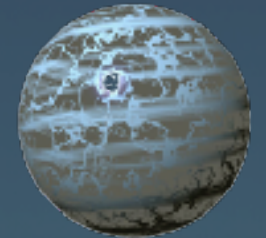
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***atmosphere***



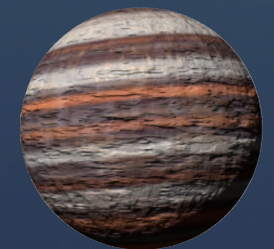
***hydrosphere***



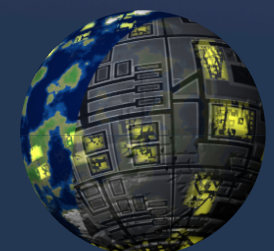
***biosphere***



***geosphere***



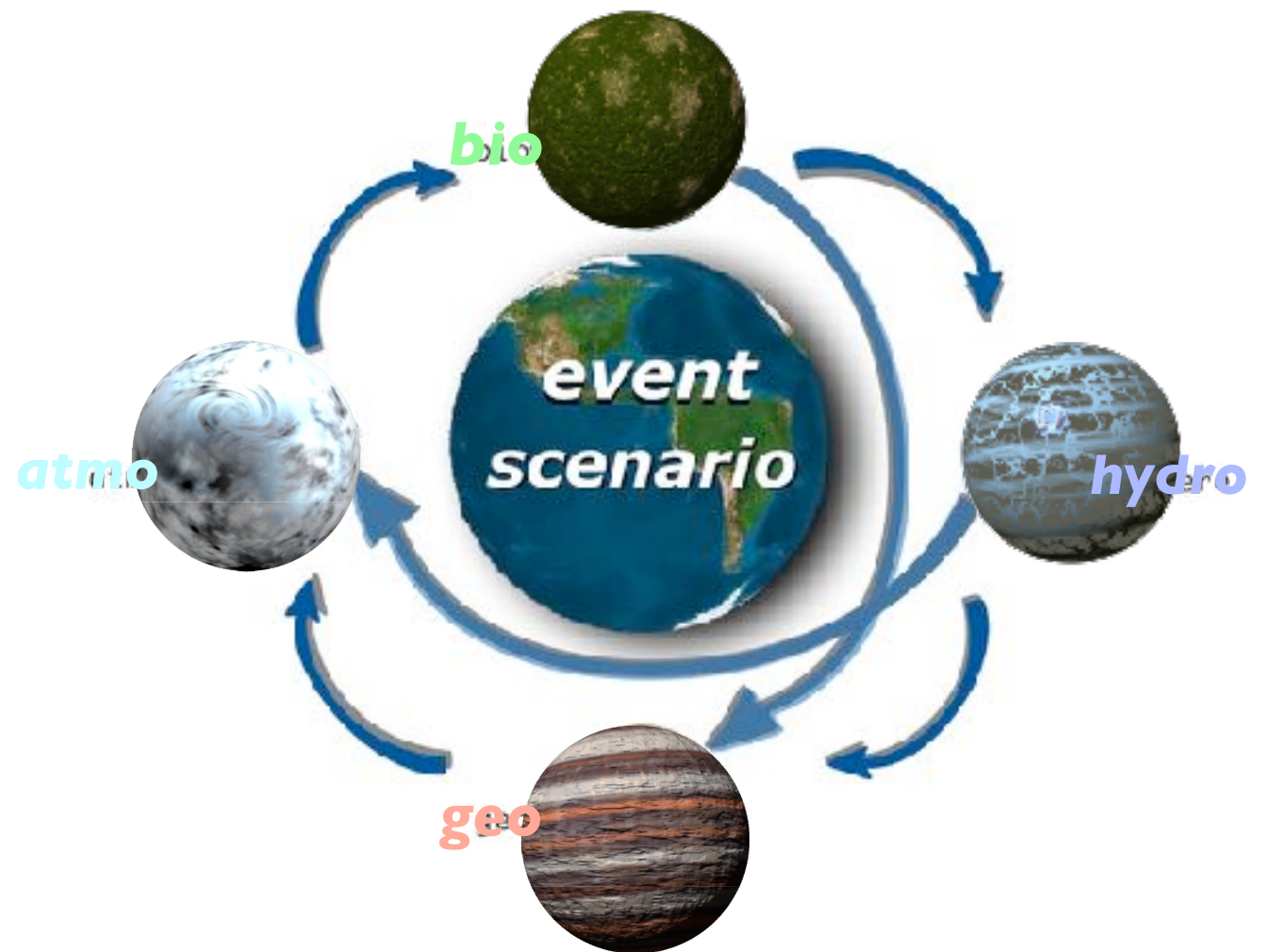
***anthrosphere***



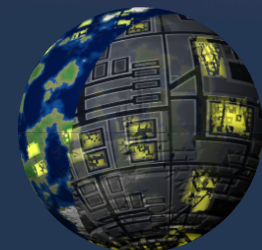


**Learners are re-assigned to an “event group”.**

**Event group members (contributing their particular sphere expertise) will work collaboratively to identify and describe an event’s impact on all spheres, with interactions, feedbacks, causal chains, etc.**



**anthrosphere**





**Both “sphere” and “event” groups develop  
Concept Maps for the event, sphere effects/  
impacts, and causal chains and feedbacks...**



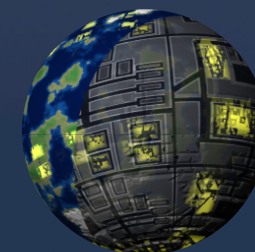
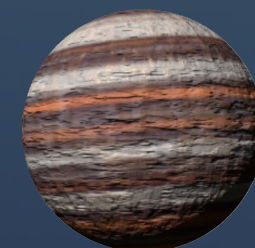
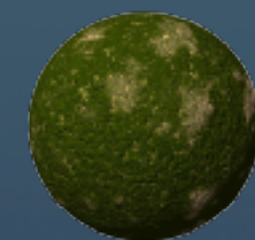
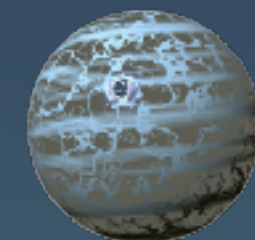
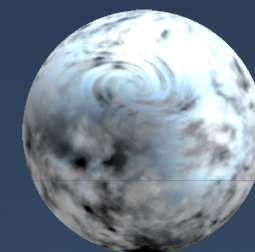
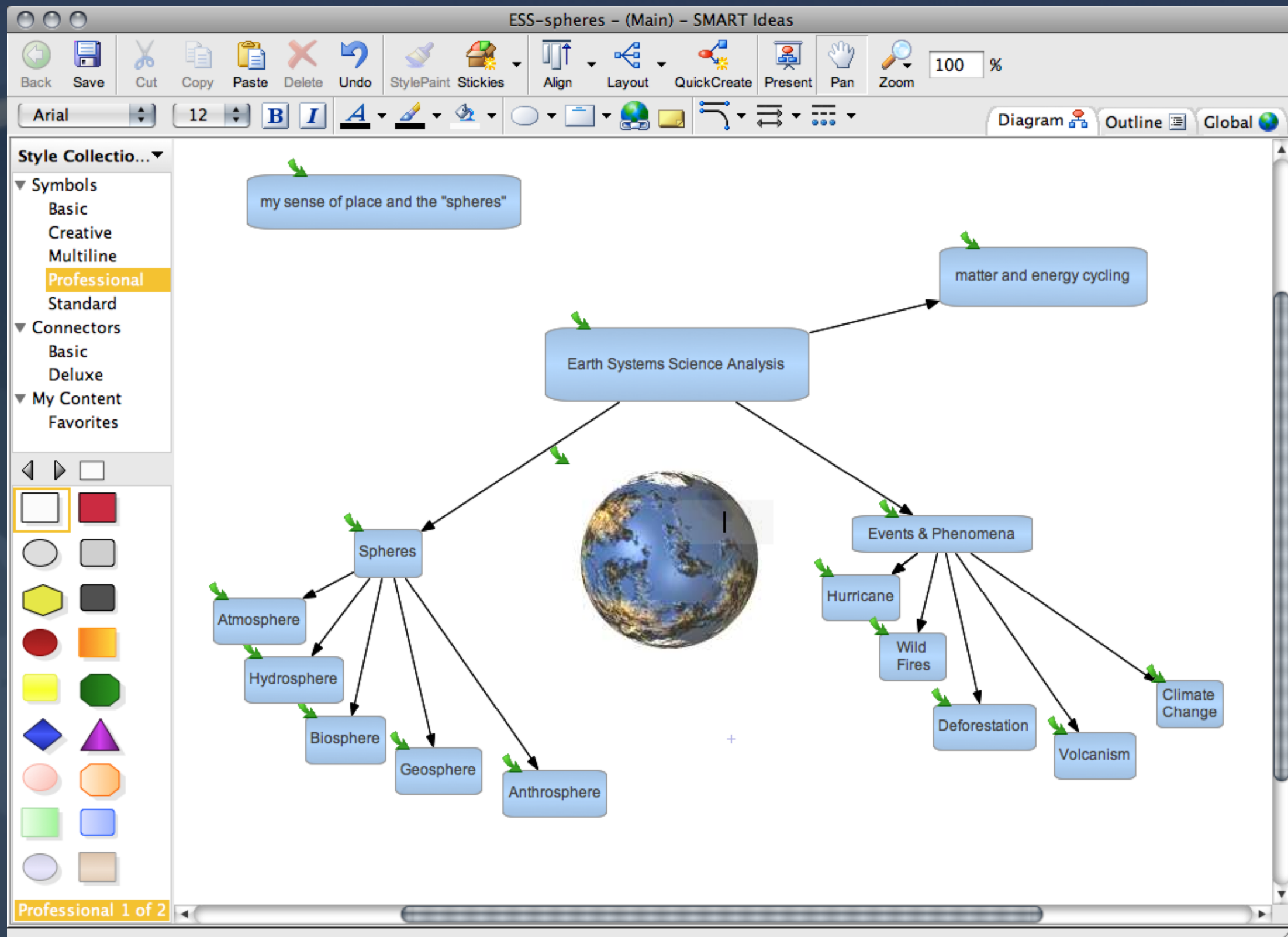
## **Causal Chain Notation**

**E > H > B .....**

**event delivers silt to  
streams, which  
impacts aquatic  
wildlife....**

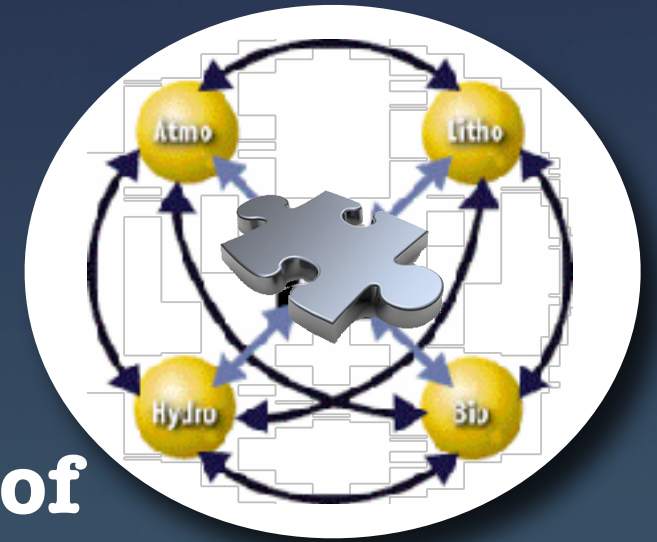








# **Concept Mapping & Causal Chain Notation**



**Concept Maps allow for graphic organization of big ideas, as well as non-linear thinking about interactions, feedbacks, and the complex interdependencies of earth systems and natural phenomena / processes.**

**Causal Chain Notation allows for concrete sequential thinking, and hierarchical ordering of dependent processes, their causes and effects.**

**e.g. E > B > A > G > H > B .....**

**“event strips vegetation, soils are thus more easily eroded, subsequent rains deliver silt to streams, which impacts aquatic wildlife....”**





## GLOBE protocol training



Southern Connecticut  
State University

### Atmosphere



### Hydrosphere



### Geosphere



### Biosphere



SCSU campus Study Site

# Environmental Systems Inquiry

ENV 350 & SCE 575

## ESS Event-Sphere Analyses

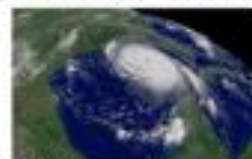


exploring events at differing spatial & temporal scales



### Hurricane

- effect along a path kilometers wide hundreds of km long
- effects last days to years



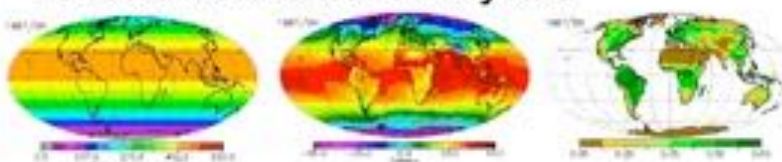
### Deforestation

- effect along a widening path kilometers to hundreds of km
- effects last decades to hundreds of years



### Climate Change

- effect local, regional and global
- effects last thousands of years



## Cove River Site

environmental data collection



Cove River is a 15 acre urban setting open-space site explored by teams of undergraduate environmental studies students, as well as graduate students in the Masters program in science education.

### Geology & Soils Analysis



### Water Quality Studies



### Forest / Biometrics



Cove River Site: open space for

- research,
- education
- recreation



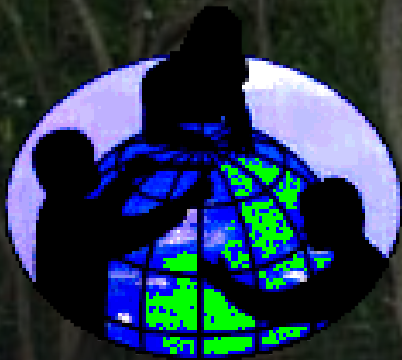


# ongoing educational activities

- SCSU Undergraduate & Graduate studies
  - Environmental Science and Environmental Education

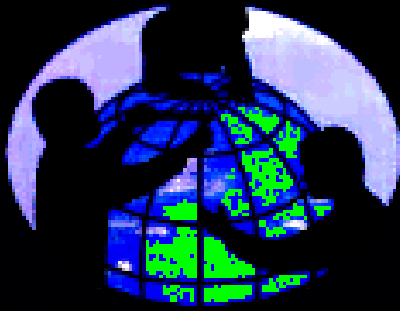
## GLOBE Program investigations

- Weather/Climate, Landscape, Hydrology/Water Quality, Biota/  
Habitat/Ecosystem, Forestry, Species, Soils, and more





# ongoing educational activities



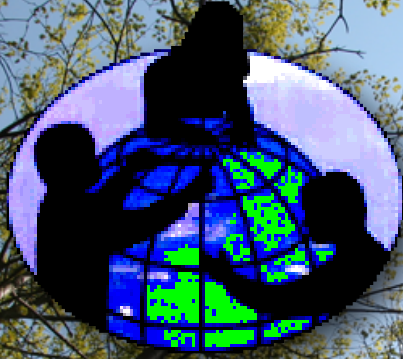
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# ongoing educational activities



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- Weather/Climate, Landscape, Hydrology/Water Quality, Biota/Habitat/Ecosystem, Forestry, Species, Soils, and more





# Cove River Site

## Past



map



Homestead



the woods

## Present



Open Space - as of 2002



Archaeological Excavations



Artifacts

## Future



Education



students



community



Archaeology





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# Cove River Salt Marsh



high tide



low tide



Spring &  
Fall in  
the Cove  
River  
forest

