Component Five:

Coordinating the Interpretation of Ecosystems

Developing models of ecosystems and envisioning sustainable ways of living with them is not enough. Our very way of knowing must have an open architecture which can interface with diverse communities of people. Just as ecosystems are diverse, so the cultures they can support are diverse. There is no one true way to live in an ecosystem. Ecological intelligence implies multicultural intelligence. As a cybernetic system, Earthscore thrives on differences. To maintain an openness to differences, Earthscore uses semiotics. Semiotics (from 'sem', the Greek word for 'sign') is a general approach to knowledge based on an appreciation of knowledge as a process of generating signs. The semiotics used in Earthscore comes out of the philosophy of Charles Peirce and encompasses both perception and language. In general, any sign (a first, which can be thought of without thinking about the object) represents something (its object, a second, which can be thought of without thinking about its interpretant) to somebody (the interpretant, a third that understands the relationship between sign and object) in some respect. In principle, any kind of local knowledge, any art form, any educational or scientific discipline can be understood in this system. Because semiotics is based on the comprehensive categories of knowledge presented in component one, it can be used to represent everything from a smudge of paint to a syllogism.

Peirce's classification of signs, or semiotic system, is acknowledged by philosophers as the richest ever devised. Moreover, the ongoing secondary scholarship about Peirce's semiotics and, indeed, about his entire philosophy, has an uncommonly high caliber and provides a great resource for teachers and curriculum designers. (Ketner, 1995) The fifth component of the Earthscore Method uses the relational circuit to transform Peirce's semiotics into a process that facilitates learning and communication in diverse disciplines among diverse groups. The exfoliation of complexity from three basic categories to a sixty six fold classification makes it possible to have a structural consistency in learning at all levels, from K through graduate school. A first grader drawing a tree for her mother is a semiotician. A graduate student building a predictive model of an estuary ecology is a semiotician.

The semiotic approach can be used directly by the various disciplines as they adapt to the needs of sustainable education. Formulating questions semiotically provides a beginning. How can math be used to represent this watershed to the people living here in such a way as to help them understand how to live here sustainably? How can science be used? How can literature be used? How can social studies be used? Using the fifth and final component of the Earthscore notation, semiotics, these questions can help shape a curriculum for sustainable education.

As mentioned, this system has different levels of complexity and educators can make use of the level of complexity appropriate to their grade level. The system exfoliates from the categories of firstness, secondness and thirdness into a tenfold schema, a twenty-eight fold schema and a sixty-six fold schema. In this presentation, I will simply use the sixty six fold schema to outline a web

site for sustainability that a school could produce at whatever level of complexity suits them.

The Earthscore Notation: A Web Site for Sustainability

A school system that used an Earthscore curriculum would produce students empowered to create sustainable societies. Obviously, that power could translate into many ways of changing behavior toward sustainability. As an example of how it might operate, I will present a web site that students educated according to all five components of Earthscore could build and maintain. A school district could organize such a web site and use it to provide sustainability curriculum for different schools and orchestra schools learning from each other. The web site would make it possible for knowledge about living sustainability to grow organically, like the body of an animal.

The web site described below incorporates multimedia and telecommunications technologies. In the design of the web site, humans and ecosystem are considered part of one interrelated circuit of signs. Briefly, the circuit can be articulated as follows: differences in the ecosystem make differences in how the ecosystem is represented on the web site, which, in turn, make differences in the actual interpretations of the ecosystem by specific people, which, in turn, make differences in how the community as a whole interprets the ecosystem. This interpretation, in turn, makes differences in how the community behaves toward the ecosystem. The topics offered by the web site are organized according to the semiotic dimensions of this circuit. Peirce's entire sixty-six fold sign system is used. By following this circuit, a community can identify and

eliminate errors in its relationship to the ecologies that support its life. For example, errors in how sensitive watershed areas are treated could be identified and corrective policies developed through a process of consensus building mediated by the web site.

In the following presentation, the Earthscore Web Site is articulated in terms of monitoring the ecology of the Hudson River Basin and developing consensus about how best to live there on a long term basis. While the presentation is explicitly for the Hudson, the design can be readily adapted for other river basins and for other natural regions such as islands, coastlines and mountain ranges. Any coherent ecological system, or bioregion, would be appropriate. Because the design of the web site provides a template that can be used in any bioregion, the web will facilitate schools and communities in different bioregions learning from each other. Basically, the design outlines a way students can use the internet to understand and respect their local ecology in the context of sustainability.

Web Site for the Hudson River Watershed

Bulletins
Regulars on the River

Watching the River Flow
Inscaping the Estuary

History of the Hudson
Of Science and the River
Investigative Reporting
The Hudson Ad Hoc

Celebrating the River

Local News
Planet News
Weather News

Celebrating the Web Site
Sponsoring the WEB site
Policing the WEB site
Regulating the WEB site

Native Peoples and the River that Runs Both Ways

European Heritage and the Hudson
African Heritage and the Hudson
Asian Heritage and the Hudson
Latin Heritage and the Hudson

The River as Fishery
The River as Recreation
The River as Healer
The River as Teacher
The River as Home

Common Sense Along the Hudson

Critical Common Sense Along the Hudson

CONSENSUS ALONG THE RIVER: TERMS

CONSENSUS ALONG THE RIVER: EVIDENCE

CONSENSUS ALONG THE RIVER: ECOLOGY

CONSENSUS ALONG THE RIVER: FIGURES OF REGULATION

CONSENSUS ALONG THE RIVER: POLICY

CONSENSUS ALONG THE RIVER: PRACTICES

Bulletins

Subject Matter:

When and where to hike, fish, swim, watch leaves turn, observe bird and animal habitats, observe duck and geese migration, observe estuary events and man-made environments. Notification of equinox, solstice, and other bioregional events.

Format:

Clear instructional text with maps and light graphics. Concise.

Rationale:

First-hand familiarity with the Hudson is critical for maintaining an understanding and respect for the ecology. Smells, winds, sights, cold, sunlight: people need to know their place through the skin as well as through the electronics. Getting out on the river is the best antidote to electronic distortions.

Regulars on the River

Subject Matter:

Spending time with people who regularly relate to the ecosystem directly: Boat captains, dredgers, fishermen, bird watchers, hikers, wild flower enthusiasts, long term residents.

Format:

Follow the contour of their activity. Over the shoulder participation using audio, video and still photography. Share observations, listen to stories, comments, folklore, oral history.

Rationale:

Gain familiarity from those who are familiar. Turn over the folklore. Recognize and cultivate it.

Watching the River Flow

Subject Matter:

Wonder of the Basin. Ongoing systematic video studies of the bight/estuary/watershed phenomena. Live and taped, fed from satellite scanning of Hudson. GIS systems. Fixed camera monitoring key features of the system checked on regularly.

Format:

Satellite, GIS and fixed cameras punctuated by Zen perception. Small teams trained in Zen, Ta'i Chi, and method of orchestrating video perception to see what is there without judgement or comment. Single color camera work with live sound and minimal editing. Keyed to phases of the moon.

Rationale:

Approach the basin with as few preconceptions as possible. Take advantage of advanced observational technology. Small trained groups can gain a more reliable perception than individual videomakers.

Inscaping the Estuary

Subject Matter:

Careful observational video studies of the natural patterns identified by scanning the basin. The self-evident natural patterns or "icons" of nature's own "language." The iconography of the ecosystem. Examples: water flow patterns, insect and animal behavior patterns, tidal dynamics, cloud formations, flower cycles.

Format:

Formats that amplify the icons themselves. Camera angles, slow motion, time lapse, whatever arrangement of techniques serve to make each specific icon of the ecosystem an event in the mind. Analysis of icons for their underlying structure.

Rationale:

Connection between the reality of ecosystem and our understanding of the ecosystem found in these icons that are "first for us," in our instinctive perceptual ability to make sense out of the order of the ecosystem.

History of the Hudson

Subject Matter:

History of the people in the estuary/watershed. Rendering of Paleo-Indian, archaic woodland, colonial, industrial, and bioregional history.

Format:

Follow nature of historic evidence and research. As little "talking-heads" stuff as possible. On site photography and video and presentation of artifacts.

Rationale:

Actual history of human cultures that occupied this region would improve our understanding of how best to live here.

Of Science and the River

Subject Matter:

Scientific inquiry into the ecosystem. Consideration of various species: biology, population distribution, physiological and ecological requirements. Study of nutrients, organic and inorganic contaminants and energy patterns. Investigation of physical, chemical, and geological processes such as global warming and ozone depletion and their effects on the ecosystem. Effects of pollutants on biology.

Format:

Would follow the method of inquiry proper to science. Reckon with both on site studies, literature searches and laboratory experiments.

Rationale:

Knowledge base from sciences critical for developing stable consensus. Any abduction or guess-at-workings of the ecosystem arrived at through observation of natural patterns must be tested inductively by rigors of science. Accumulation of scientific expertise and data must be brought to bear, especially since so many toxins escape perception unaided by scientific instrumentation. Work toward establishing a scientifically valid, predictive model of the river ecology.

Investigative Reporting

Subject Matter:

Investigative journalism into issues that effect the river. Water quality, toxic waste, proposed developments, health/environmental issues.

Format:

Emphasis on visible evidence gathered by video and still cameras. Presentation of such evidence to responsible parties for comment. Care taken to present opposing views fairly. Context of investigation --consequences for basic ecology.

Rationale:

Must monitor actual facts of ongoing situation. Gather evidence to identify and eliminate practices that transgress the ecosystem.

The Hudson Ad Hoc

Subject Matter:

Special programs that deal with specifics not considered within the range of normal subjects.

Format:

As appropriate to the specific.

Rationale:

Don't want to miss anything. Also, this slot could easily be opened to independent minded investigators.

Local News

Subject Matter:

News stories that relate to the Hudson Valley.

Format:

Appropriate to the story. Text, images.

Rationale:

Let people know what is happening in a bioregional context.

Planet News

Subject Matter:

Planet wide stories that have to do with bioregional goings on. Example: acid rain legislation in the midwest that effects the Hudson River. Relate locale to Gaia Hypothesis.

Format:

On-site as much as possible. Set up exchange of news services. Text and image.

Rationale:

Keep bioregional context in planet-wide context. Learn from other places and peoples.

Weather Reports

Subject Matter:

Relate weather patterns to the ecology of the bioregion.

Format:

Use satellite extensively and link up to planet wide weather patterns.

Rationale:

On line to the ecology in terms of day-to-day.

Celebrating the River

Subject Matter:

Poetry, stories, theater, interpretation of iconic images from the watershed in music and dance. Explore web site as an artistic medium related to the ecology.

Format:

Determined by artists.

Rationale:

Aesthetic amplification of estuary ecology. Pure delight. Encourage regenerative and regenerating models of perceiving basin.

Celebrating the Web Site

Subject Matter:

Electronic web art, working with electronic signal itself, without river content.

Format:

Determined by artists.

Rationale:

Keep perceptions of the web site itself enlivened.

Sponsoring the Web Site

Subject Matter:

Advertisements: businesses, products, services, institutions in keeping with the health of Hudson.

Format:

Spots determined by advertiser. Arrangements would also be made to allow periodic inspection of operations by a crew using ecological criteria, a crew could/would report their findings over the channel. Fair format would have to be developed.

Rationale:

Encourage prosperity in keeping with the health of the ecosystem. Source of revenue.

Policing the Web Site

Subject Matter:

Self-inspection of web site itself;- electronic components, production practices, and so forth in terms of effects on the ecology.

Format:

Determined by team of investigators.

Rationale:

Electronic technology not innocent ecologically, 500,000 pounds of PCBs in river from dumpings by General Electric. Ought to self-police, as best the web site can.

Regulating the Web Site

Subject Matter:

Public discussion of web site policies by management.

Format:

As simple as possible to expose the governing process. Include open feedback channel, guest critics, and commentators. Use two-way capacity.

Rationale:

Workings of the web site open to the public for inspection and discussion.

Native People and the Water that Moves Both Ways

Subject Matter:

Reconstruction, celebration, inquiry into way of life of native peoples., who called the Hudson The River That Runs Both Ways. Consider the traditional way of life before colonization and contemporary native American life.

Format:

Determined by native people.

Rationale:

Native cultural intelligence is a significant, if not critical, component in long term bioregional stability.

Heritage and the Hudson

Subject Matter:

Varied cultural interpretations of ecology of Hudson Basin, appropriate to various immigrant groups: European, African, Asian, Latin American. History of various ethnic groups along the river.

Format:

Determined by heritage group.

Rationale:

Amplify appreciation of river ecology. Identify possible pathologies in imported cultural attitudes.

The River As……

Subject Matter:

Series of presentations by special interest groups interpreting the ecology from the stance of their special interests: fishermen, energy companies, government agencies, educators, recreation groups, and so forth.

Format:

Determined by the group.

Rationale:

Any self-identified group with legitimate interest in the river has the right to present its views in process of developing consensus.

Common Sense Along the Hudson

Subject Matter:

Ordinary inhabitants talking about living in this place. Reasoning about best way to live here. Talking issues.

Format:

On-site gathering of data in text and images. Go up and down the river and visit regions systematically. Different sub-basins and sub-tiers of the basin.

Rationale:

Common sense of ordinary people can go a long way toward making sense out of how best to live here.

Critical Common Sense Along the Hudson

Subject Matter:

Discussion of data gathered about the ecology by people and groups with special expertise: scientists, engineers, educators, lawyers, etc. All talking from the base of their particular knowledge.

Format:

Determined by each group in accord with data selected.

Rationale:

Much critical information about ongoing health of the watershed is beyond realm of common sense and in the knowledge terrain of specialists.

Consensus Along the River: Terms

Subject Matter:

Open discussion of what natural patterns discovered by observation, and what interpretations of those patterns, would be admissible in a general discussion of the whole community concerned with the ongoing health of the ecosystem.

Format:

There are specific procedures for arriving at consensus about what images of what natural patterns would be used in a general discussion. These consensus procedures will not be detailed here. The discussion about consensus of terms and other consensus discussion described in what follows will have a format that reflects these consensus procedures.

Rationale:

Community needs to come to a consensus about terms in which discussion of general health of the ecology can take place.

Consensus Along the River: Evidence

As above, only concerned with evidence. Draw on legal tradition for rules admitting evidence.

Consensus Along the River: Ecology

Subject Matter:

Arguments from terms and evidence by various parties, organized to arrive at a working syntax of the ecology of the Hudson Basin.

Format:

Procedure for presenting arguments. Arguments heard by a consent committee. Use two-way capacity.

Rationale:

Must base overall behavior on best common understanding of the ecosystem that the community can muster.

Consensus Along the River: Figures Of Regulation

Subject Matter:

Arguments from the syntax of natural ecology: If we do not do:

1. ?
2. ?
3. ?

then we can be assured that the ecosystem of the Hudson will be regenerative and life-supporting on a long term basis. What are the appropriate figures of regulation for the human species here?

Format:

Argumentation before a consent committee. Interactive.

Rationale:

Must identify common constraints on human species behavior in the ecosystem.

Consensus Along the River: Policy

Subject Matter:

Argumentation about how these basic ecological restraints translate into public policy about transportation, housing codes, food production, energy, extra-regional relations....

Format:

Argumentation before the consent committee.

Rationale:

Need to translate general constraints into specific policies.

Consensus Along the River: Practices

Subject Matter:

Documentation and development of practices that are in accord with the regenerative health of the river ecosystem.

Format:

Follow nature of the practice. Instructional information on how to manage a woodlot, develop permaculture, garden, cook native, build bioshelters. Discussion of relative merits of various practices.

Rationale:

Learning how to live in place in a sustainable way requires a whole range of skills and habits we have yet to develop and learn. Reinhabitation.