CONNECTED BY NATURE
LINKING THE PUBLIC TO SCIENCE
EMERSON H. SMITH
CONNECTED BY NATURE
LINKING THE PUBLIC TO SCIENCE
EMERSON H. SMITH
AS HUMAN DEVELOPMENT INCREASINGLY PUTS PRESSURE ON THE NATURAL ENVIRONMENT, RESEARCH INTO HOW TO MITIGATE DAMAGE WILL BE MORE VITAL THAN EVER.

Despite this, society chooses to ignore the advice of experts and disregard the remedies that are proposed.

Society will need to live with the results of our action or inaction as we continue to forge into an increasingly human dominated world.

Many people draw their identity with a location. Keeping this land healthy and productive requires thoughtful approach involving everyone.
THE STATUS OF SCIENCE

HIGH LEVELS OF DISTRUST OF SCIENTISTS WITHIN SOCIETY

FUNDING CUTS ARE PROPOSED TO MAJOR RESEARCH INITIATIVES

DISREGARD FOR ECOLOGICAL RESEARCH HAS BECOME THE NORM, NOT THE EXCEPTION
REGIONAL ISSUES

NW ONTARIO AND NE MINNESOTA

BIRCH DIE OFF

WOLF POPULATION

LAKE TEMPERATURES

MINING
HOW CAN ARCHITECTURE FOSTER A STRONGER CONNECTION BETWEEN ECOLOGICAL CONSERVATION RESEARCH AND THE PUBLIC?
<table>
<thead>
<tr>
<th>SYSTEM OF INQUIRY</th>
<th>STRATEGIES</th>
<th>TACTICS</th>
<th>PHILOSOPHY/THEORY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emancipatory</td>
<td></td>
<td></td>
<td>Eco-Social (Sustainable Design)</td>
</tr>
<tr>
<td>There are multiple realities, but they are overlapping. Developed through historical/social/cultural and empowerment identity. This project is an attempt to let people apply science to their reality. Allowing multiple views leads to increased connection and trust.</td>
<td>Qualitative Learning the needs of the clients and visitors leads to a space that satisfies the needs of all involved. Logical Argument Multiple iterations can lead to new forms that fit the site and program better. Holistic Case Studies Review multiple examples of existing structures can show what works and what doesn't based on functioning buildings.</td>
<td>Literature Review Contemporary or recognized books, articles, etc. Personal Interviews Groups or individuals, experts, subjects, occupants. Iterative Design Learning from past attempts to find the best solution</td>
<td>Respecting the site shows commitment to the ecological conservation that is being displayed and researched within the facility.</td>
</tr>
</tbody>
</table>
Go beyond experience, offer transformation: enduring memories, lasting changes that come from engaging and personalized experiences

Sociocultural dimension enhances the ability to remember the experience and shapes future experiences with the same events/ideas

“The exhibition space becomes a vessel in which objects, ideas, and people are brought together and transformed”
Kathleen McLean

“The best predictors of how visitors would remember, react to or act upon conservation related material were their degree of involvement in and knowledge about conservation issues.”

EVALUATING VISITOR CONSERVATION RESEARCH AT THE MONTEREY BAY AQUARIUM

LEARNING FROM MUSEUMS
INTERVIEWS

MIKE CARNEIRO
ONTARIO MINISTRY OF NATURAL RESOURCES AND FORESTRY

JESSE SCHOMBERG
MN SEA GRANT

PAUL DOHERTY
EXPLORATORIUM

ANTHONY FIORILLO
PEROT MUSEUM OF NATURE AND SCIENCE

JAY WALKER
GREAT LAKES AQUARIUM

KIMBALL SUNDBERG
SEWARD ALASKA SEA LIFE CENTER

KELLY SMITH
CARLTON SWCD

PAUL PEPE
THUNDER BAY TOURISM DEPARTMENT
SAMPLE QUESTIONS

How often do you interact with members of the public for your work?

Do you think that ecological research would accomplish more with or without public input?

Do you find that a certain teaching style is most effective with getting information across in an interpretive center?

How do you view the visitors to your facility? Students? Partners? Skeptics?

What barriers keep you from effectively communicating your work to the public?

How can you best ensure that your message will influence the public?

What is the most essential space in your facility to ensuring that the mission of your institute is met?

What is the next step for interpretive centers?
SAMPLE QUESTIONS

How often do you interact with members of the public for your work?

Do you think that ecological research would accomplish more with or without public input?

Do you find that a certain teaching style is most effective with getting information across in an interpretive center?

How do you view the visitors to your facility? Students? Partners? Skeptics?

What barriers keep you from effectively communicating your work to the public?

How can you best ensure that your message will influence the public?

What is the most essential space in your facility to ensuring that the mission of your institute is met?

What is the next step for interpretive centers?
“Nobody flunks a museum: Frank Oppenheimer.”

PAUL DOHERTY

“Keep in mind many visitors to these facilities expect to be entertained, and learning is a side-bar.”

KIMBALL SUNDBERG

“We can actually get [the public] involved and participating in it through citizen science... Not only do they understand the work better, but they have greater trust in the outcomes of that work because they were involved with it...”

JESSE SCHOMBERG

“The public doesn’t have the background”

MIKE CARNEIRO
SEVERAL COMMONALITIES REPEATEDLY SHOWED UP THROUGHOUT THE RESEARCH. THESE ARE TREATED AS VITAL COMPONENTS OF THE FACILITY’S DESIGN.

Interacting with science first hand provides the strongest connection to the material.

Take form inspiration from the surrounding landscape and the local culture.

Embrace a variety of learning styles to impart information to as diverse an audience as possible.

Expose the research method to the public as much as possible.
THE GIANT ON THE HORIZON
THE SLEEPING GIANT

ENTRENCHED IN LOCAL LORE
"RESTING PLACE OF THE OJIBWAY GIANT NANABJOU"

A DEFINING FEATURE OF THE HORIZON
ONE OF ONTARIO’S HIGHEST CLIFFS (700 FT/250 M)

ONE OF CANADA’S MOST BELOVED NATURAL LANDMARKS
WINNER OF CBC’S 7 “WONDERS OF CANADA” POPULAR VOTE (2007)

EASTERN FACE
CHIMNEY LOOKOUT
TALUS LAKE
THUNDER MOUNTAIN
Starting in 1975, Thunder Bay began to transition their waterfront from industrial to mixed use. The first phase of this plan, designed by Brook McIlroy, was opened to the public in 2011. The accolades and resulting revitalization of the neighboring downtown spurred the city to continue their plan to redevelop additional waterfront.

The Pool 6 area is set to counter to what has already been built, being more of a landscape than a concrete investment. Much of Pool 6 has been set aside for nature trails, revitalized natural ecosystems, and open fields. It is fitting to place a facility that respects the land and supports the wilderness that Thunder Bay is known for. By being located in such a prominent location the public will be able to easily interact with researchers there.
POOL 6

OCTOBER 1
2:00 PM
THE DESIGN
THUNDER BAY ECOLOGICAL INTERPRETIVE CENTER

Providing an interface for people to be informed about the landscape that surrounds them.

Client: Ontario Ministry of Natural Resources and Forestry, Interested Locals, Tourists
RESEARCH
Monitor and support the ecosystems in the Thunder Bay Region. By doing so the land will remain healthy and an economic asset for the people who live there.

CITIZEN SCIENCE
Provide an outreach to visitors, both locals and tourists. Expose them to what ecological researchers do to reach logical conclusions about the state of the ecosystem.

EXHIBIT
Inform visitors of the issues that the local landscapes face and provide suggested solutions to them. Take pride in the natural features in the area.
FORM ITERATIONS

PARALLEL THE NORTH SHORE

BRING VISITORS INLAND

PROVIDE ACCESS TO THE WATER

A CAMPUS OF STRUCTURES
<table>
<thead>
<tr>
<th>Program</th>
<th>Sq Ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIRCULATION</td>
<td>12,700</td>
</tr>
<tr>
<td>ENTRANCE/LOBBY</td>
<td>2,900</td>
</tr>
<tr>
<td>LABORATORY</td>
<td>10,500</td>
</tr>
<tr>
<td>RESEARCH WORKSPACE</td>
<td>6,800</td>
</tr>
<tr>
<td>CAFE</td>
<td>2,100</td>
</tr>
<tr>
<td>GALLERIES</td>
<td>14,600</td>
</tr>
<tr>
<td>PRESENTATION</td>
<td>2,000</td>
</tr>
<tr>
<td>CITIZEN SCIENCE</td>
<td>5,000</td>
</tr>
<tr>
<td>FACILITATOR OFFICE/ADMINISTRATION</td>
<td>2,600</td>
</tr>
<tr>
<td>EDUCATION</td>
<td>1,800</td>
</tr>
<tr>
<td>WORKSHOP</td>
<td>1,100</td>
</tr>
<tr>
<td>MECHANICAL</td>
<td>7,800</td>
</tr>
<tr>
<td>RESTROOM</td>
<td>1,900</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level</th>
<th>Sq Ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEVEL 1</td>
<td>62,000</td>
</tr>
<tr>
<td>LEVEL 2</td>
<td>14,000</td>
</tr>
<tr>
<td>TOTAL</td>
<td>77,000</td>
</tr>
</tbody>
</table>
**GROUND LEVEL**

1. ENTRANCE/LOBBY
2. CENTRAL ATRIUM
3. INTERACTION SPACE
4. CITIZEN SCIENCE SPACE
5. LABORATORY
6. ARCHIVE
7. SLEEPING GIANT GALLERY
8. GALLERY
9. CLASS ROOM
10. WORKSHOP
11. PRESENTATION SPACE
12. NORTH GALLERY HALL
13. KITCHEN
14. GIFT SHOP
15. AUDITORIUM
16. CAFE

**SECOND LEVEL**

17. FACILITATOR OPEN WORKSPACE
18. BRIDGE
19. RESEARCH COLLABORATION
20. OPEN PLAN RESEARCH SPACE
ALONG THE SLEEPING GIANT

NORTH SECTION (SLEEPING GIANT GALLERY)
As humanity continues to expand the built environment, the pressure placed upon the natural world continues to grow. The impact can be seen in the numerous issues society has chosen to largely disregard the individuals tasked to solve it. Scientists continue to feel resistance to their work, and the situation continues to grow. A hard reevaluation of how humans should react is needed as we forge into the next era of the Anthropocene. Despite this, there are signs of hope.

**CONNECTED BY NATURE**

**INTERPRETIVE SCIENCE CENTER**

**THUNDER BAY, ONTARIO, CA**

**ORGANIC MATERIAL PALLET**

Providing a space for conservation ecologists to monitor the landscape and the public to learn about it, interpretive science centers serve as both a place of education and discovery. To take the next step is to integrate visitors into the process.

The two main galleries take cues from the site. Oriented so as to respect the shore line and provide captivating views of the surrounding landscape, the galleries are parallel to the shore. Major circulation areas resemble chimneys found on nearby rock formations. Their undulating form provides areas to gather along the edges while directing movement down their length. Laboratories are included within the building, but act as visual focal points. Axes point people towards the eastern end of the Pool 6 for interaction.

**SLEEPING GIANT GALLERY**

**ARCHIVE**

**LABORATORY**

**INTERACTION SPACE**

**CAFE**

**KITCHEN**

**FACILITATOR OPEN WORKSPACE**

**BRIDGE**

**OPEN PLAN RESEARCH SPACE**

By placing this facility along the reclaimed waterfront, an easy connection to what is learned in the surrounding landscape is made. Dominating the horizon is the most iconic landform of the city, the Sleeping Giant. Closer to the shore, the Sleeping Giant is less visible, but closer to the iconic landform.

Interpretive science centers gained a major foothold since the mid-eighties when the Monterey Bay Aquarium pioneered a new approach to presenting research to visitors. This now ubiquitous approach allows for people to see how science is conducted. Adjacent spaces for experts and interested individuals allow for a more direct exchange. By showing the public live experiments they will be more engaged and inspired to take the next step. Information provided gave insight into the success of outreach initiatives from those that perform them. By placing the facility along the reclaimed waterfront an easy connection to what is learned in the surrounding landscape is made.

With the new Perot facility locals have been encouraged to be more engaged and inspired to take the next step. By showing the public live experiments they will be more engaged and inspired to take the next step. The local community has been encouraged to be more engaged and inspired to take the next step. The feedback provided to the public allowed for a better articulation of information that was in some cases absent from articles. Perot's facility provided a platform for their research and allowed for a direct exchange between the public and the experts. Provide information using a variety of methods to ensure that the greatest range of people are reached. In several spots, scientist are required to cross through public spaces. Laboratories and are given views to the environmental context which is referenced. The public can learn how science is conducted, and the experts can learn how the public interacts with the science. Not only do they understand the science, but they also understand the public's interaction with it. This more research grounded approach to science education will advance our knowledge of nature.

To better understand what works for science centers, case studies on a wide variety of existing buildings were conducted. Focus was on developing a language that could inform what was required in plan for a successful facility. The experts. Provide information using a variety of methods to ensure that the greatest range of people are reached. In several spots scientist are required to cross through public spaces. Laboratories and are given views to the environmental context which is referenced. The public can learn how science is conducted, and the experts can learn how the public interacts with the science. Not only do they understand the science, but they also understand the public's interaction with it. This more research grounded approach to science education will advance our knowledge of nature.