

Science on a Sphere Interactivity



Leon Geschwind, Science Education Manager
Brad Evans, Senior Exhibit Designer



BISHOP MUSEUM

Bishop Museum



Overview

- Kiosk
- Missions and Exhibits
- Sphercasting
- Citizen Science
- Applications

SOS Kiosk



Real-Time Infrared Satellite Imagery

The satellites that collect these data are geostationary, meaning that they rotate at the same rate as the Earth so that the satellites are over the same spot on Earth all the time. This allows them to collect a continuous stream of data for one location so that "movies" of the data can be made. This real-time dataset is shaded on a gray scale, meaning that the lowest clouds are a very light gray and the highest clouds are bright white. These geostationary infrared (IR) satellite images are used by meteorologists to determine where clouds are, but more importantly, how the clouds are moving. Do you notice any storm systems around the world over the past five days?

Data source: MTSAT
Data development: Fred Mosher, JVC
Visualization development: Steve Allen, NOAA/GSD

ATMOSPHERE
OCEAN
LAND
PLANETS
MODELS & SIMULATIONS
OTHER DATA

Connect

Surface Winds
Surface Winds
Satellite Mapping
Real-Time Infrared Satellite Imagery
Real-Time Storms
Weather Forecasts

ROTATE
TILT
ANIMATE
RESET
HELP

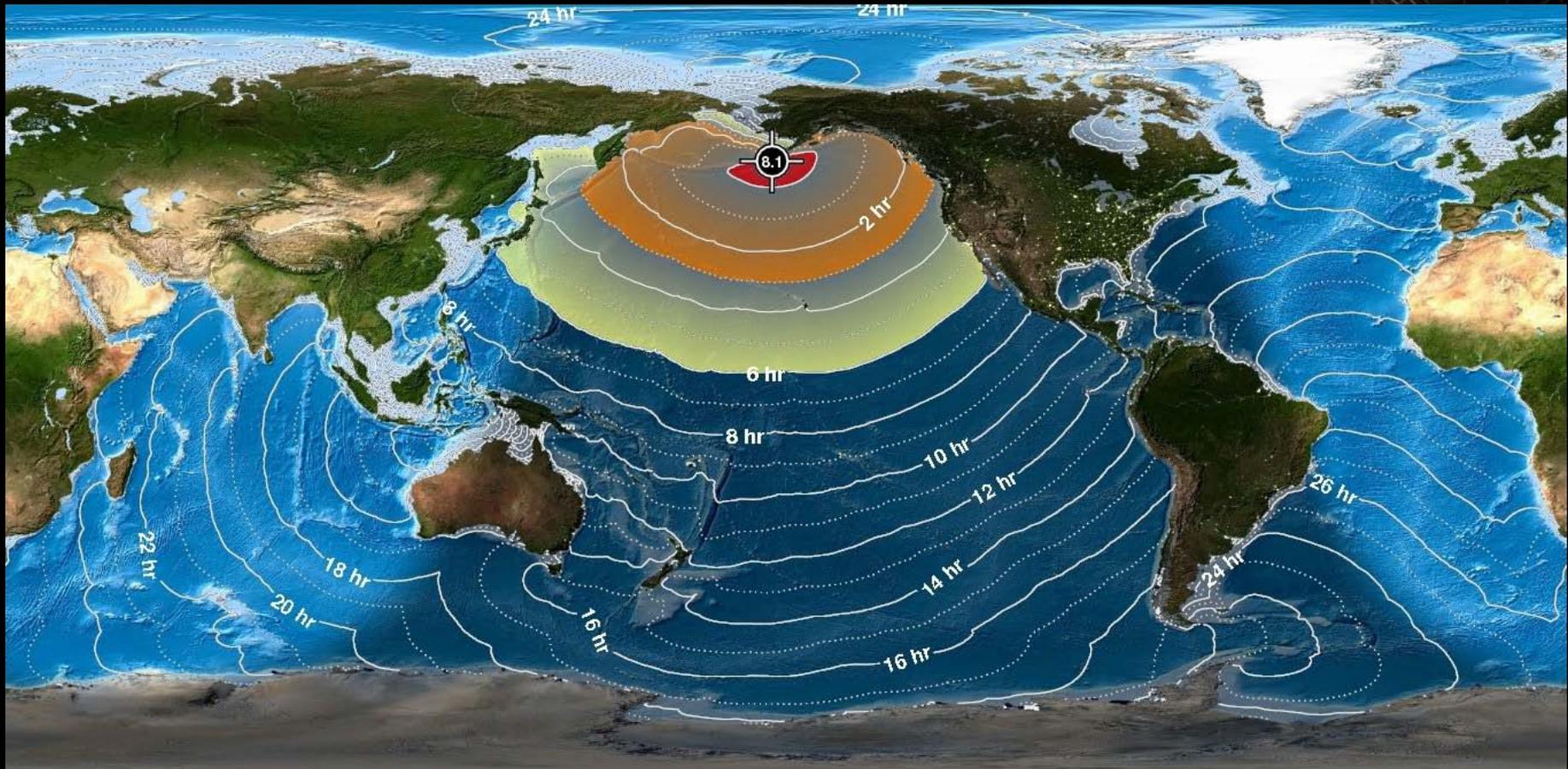
- Interactive touch screen
- Built-in counter
- Nearly 50 data sets, including narrated SOS movies
- Missions (in development)

Interactive Missions and Exhibits (in development)



Pacific Tsunami Warning Center Operations Room, Director of the PTWC

Tsunami Travel Time (TTT) + 1 Hour



UNIMAK ISLAND REGION,
ALASKA

Lat: 53.3°N Lon: 163.2°W
Depth: 25 km / 15 mi

Epicenter
w/ Magnitude



ORIGIN

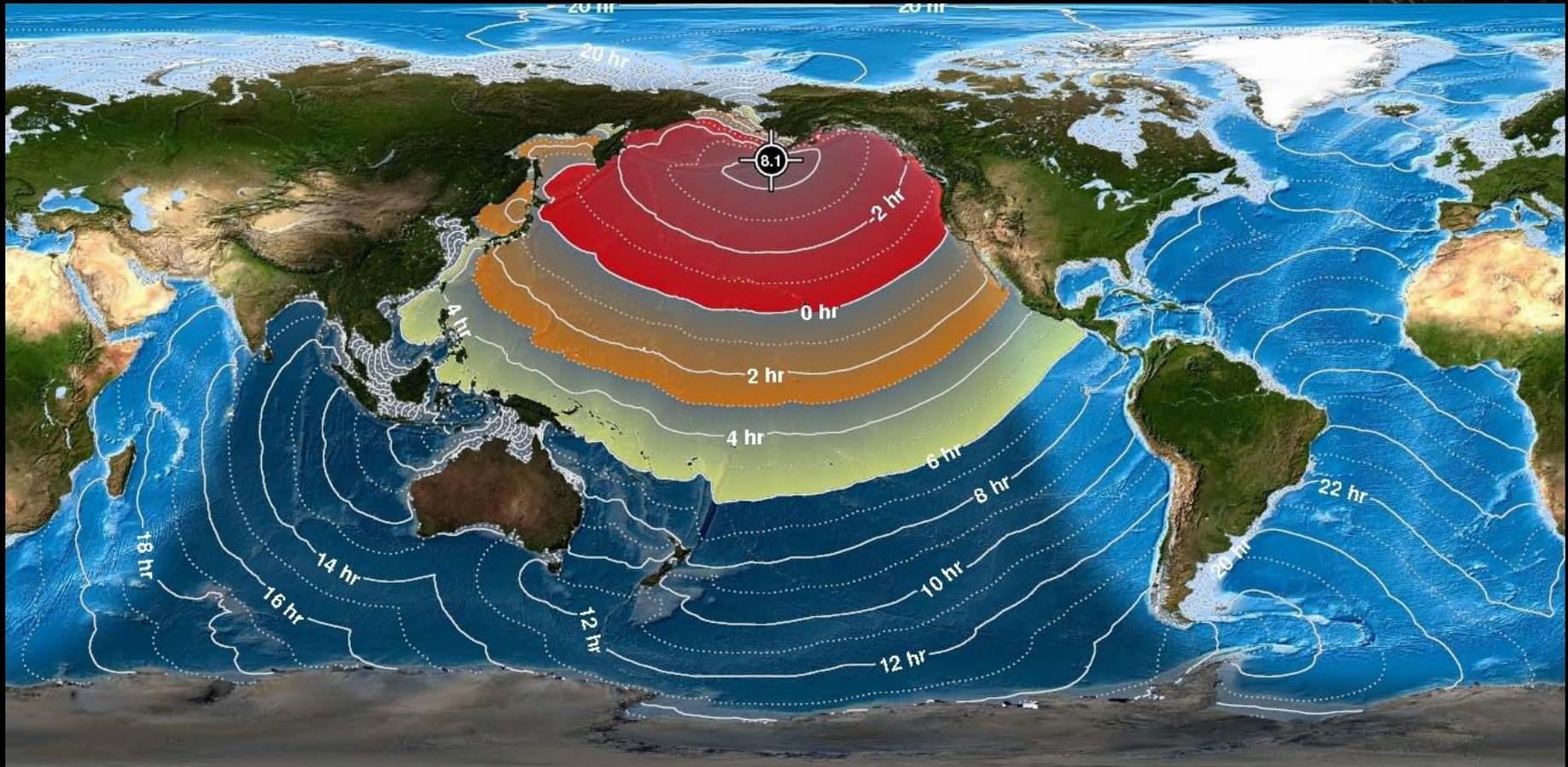
TSUNAMI TRAVEL TIME



Origin Time: 21 Jul 2008 08:18 Z
Current Time: 21 Jul 2008 09:08 Z

ΔTime: 0:50 hours

TTT Map + 5 Hours



**UNIMAK ISLAND REGION,
ALASKA**

Lat: 53.3°N Lon: 163.2°W
Depth: 25 km / 15 mi

Epicenter
w/ Magnitude



ORIGIN

TSUNAMI TRAVEL TIME



Origin Time: 21 Jul 2008 08:18 Z
Current Time: 21 Jul 2008 13:13 Z

ΔTime: 4:55 hours

Tsunami Hazard Information Service

Overview

The Tsunami Hazard Information Service provides residents and visitors of the State of Hawai'i easy, online access to the State's tsunami evacuation zone maps as well as information about potential risks, how to prepare, and what to do in the event of a tsunami.

This service was created by the NOAA Pacific Services Center in partnership with the State of Hawai'i. To find out if you are located in a tsunami evacuation zone, enter your address or island area in the search boxes below.

Tsunami Evacuation Zones

The Tsunami Map Viewer returns a map of areas with Tsunami Evacuation Zones based on information that you enter.

Search By Address

Address:

City:

Zip:

Search By Island Area

Island Area

Island Area:



Hazard Education and Awareness Tool (HEAT)

Map 12: Sunset Beach to Waialua Bay



Note 1
When evacuation boundaries are drawn along streets and roadways, they are considered to be safe from wave action.

Note 2
Steel and/or concrete buildings of six or more stories in height should provide adequate protection if people move to the third floor or above.

TSUNAMI WARNINGS

CURRENT TSUNAMI BULLETINS FOR HAWAII - NOAA Pacific Tsunami Warning Center

Know the Natural Warning Signs of Tsunami

- ▶ **Strong local earthquakes may cause tsunamis** - If the shaking causes you to fall or have difficulty standing, this is your first natural tsunami warning sign. Protect yourself from the earthquake effects and when the shaking stops, leave the evacuation zones immediately.
- ▶ **Receding Water** - As a tsunami approaches the shoreline, it could possibly expose the ocean floor, reef, and fish.
- ▶ **Seeing or hearing the water** - You might see an approaching wall of water and/or hear a loud roaring sound similar to that of a train or jet aircraft.

Sensing a Tsunami



Tsunami Warnings

NOAA's Pacific Tsunami Warning Center (PTWC) has responsibility for tsunami monitoring and the subsequent issuance of any necessary watches or warnings for Hawaii.

- ▶ **Urgent Tsunami Warning**
- ▶ **Tsunami Watch**
- ▶ **Tsunami Warning**

To learn more about the tsunami warning system visit the [NOAA Tsunami Website](#)

Emergency Information

The Hawaii's State Emergency Alert System (EAS) is used to notify the public of a possible approaching tsunami. A steady three minute siren tone is the attention alert signal. Turn on the nearest radio or television and listen for emergency information and instructions.

In some cases not all radio or television stations may be able to transmit. As part of the EAS particular radio stations have been designated as primary sources for information. Click the link below to find out more about these stations.

EAS Radio Stations

The State and County Civil Defense Agencies test the EAS at 11:15 a.m. on the first workday of the month. When you hear the test sirens or your radio or television program is interrupted this is your opportunity to think about what you will do when it's not a test.

Hawaii State Civil Defense



NOAA PSC

Serve Up Your Hazard Data and Information via the Internet:

Turn Up the HEAT!

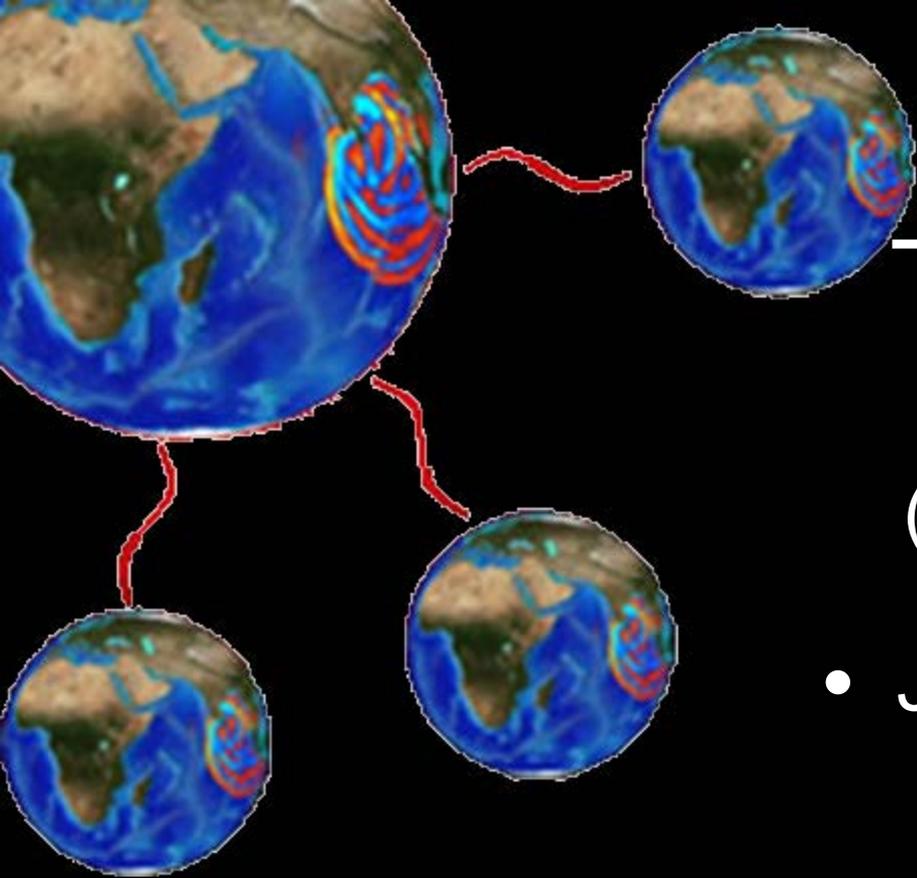
The Hazard Education and Awareness Tool (HEAT) is an innovative, free tool that brings hazard information to your citizens. This interactive tool uses Google Maps to allow users to enter an address into the search boxes to identify hazard risks near where they live or work.

The tool creates an easy-to-understand risk map that agencies can post with related educational and awareness information, such as evacuation instructions and sheltering procedures. Getting Hazard information can be as simple as entering an address.

To see how Hawaii is using the HEAT, visit www.civildefense.gov/hawaii/

Bring the HEAT to Your Website.
Contact the NOAA Pacific Services Center for details.
(808) 532-3700





Proposed Tsunami Sphercast April 2010 (Tsunami Awareness Month)

- Joint presentation:
 - NOAA PTWC Scientists
 - NOAA PSC
 - Bishop Museum
- NOAA Viz team auto-run
- Tsunami Mission Interactive



Citizen Science: Bishop Museum and Reef Check

- Public participation in scientific-driven research
- Monitoring of coral reefs bleaching around Hawaii



Reef Check Hawai'i/ Hawai'i Institute of Marine Biology/DAR
EYES OF THE REEF Network
Coral Bleaching/Disease/COTS Reporting Form

Online Forms: www.reefcheckhawaii/eyesofthereef
Please direct any questions to: Krista Heide- Program Coordinator-Reef Check Hawai'i
Phone: (808) 953-4044 Email: contact@reefcheckhawaii.org

A. OBSERVER INFORMATION: Date of Visit: _____ Time: _____
Name: _____ Phone: _____ Email: _____
Address: _____
(please circle): Resident Visitor Tourism Industry Commercial Research Education Other
Vessel/Organization (if applicable): _____

B. SITE INFORMATION: Latitude: _____ Longitude: _____
Island: _____ Location/Site Name: _____ Max. Depth: _____
Buoy #/ Area of Reef: _____ Estimated area affected: _____

Environmental Conditions (if available)
Wind Speed: _____ Air Temp: _____ Water Surface Temp: _____ Water Bottom Temp: _____
Cloud Cover (circle): Clear Partly Cloudy Mostly Cloudy Overcast

Reef Condition (please circle)
Percent of live coral cover? 0% 1-10% 11-30% 31-50% 51-75% 76-100%
Most abundant coral type? (Table 2) Smooth Distinct Branching Rice Other: _____

C. INCIDENT INFORMATION **ARE PHOTOGRAPHS AVAILABLE?**
Did you observe signs of bleaching? If yes continue to Section D. Yes No
Did you observe signs of disease? If yes skip to Section E.
Did you observe signs of a Crown-of-Thorns Sea Star (COTS) outbreak? If yes skip to section F.

D. BLEACHING INFORMATION (Please enter a check mark (✓) into the appropriate space.)

Types of Corals Bleached? (Table 2)	Percent of coral bleached?	In general, how severe was the bleaching?
Smooth Coral (<i>Porites</i>)	0%	Bleached only on upper surface
Mounding (<i>P. lobata</i>)	1-10%	Pale (very light brown, purple or yellowish)
Finger (<i>P. compressa</i>)	11-30%	Totally Bleached White
Plating (<i>P. rus</i>)	31-50%	Bleached Coral with Algae
Rice Coral (<i>Montipora</i>)	51-75%	
Red rice (<i>M. capitata</i>)	76-100%	
Blue rice (<i>M. flabellata</i>)		
Tan/Purple rice (<i>M. patula</i>)		
Distinct Branching Coral (<i>Pocillopora</i>)		Depth where bleaching was observed?
Cauliflower (<i>P. meandrina</i>)		MIN (ft)
Lace (<i>P. damicornis</i>)		MAX (ft)
Antler (<i>P. eydouxi</i>)		
Other (specify)		

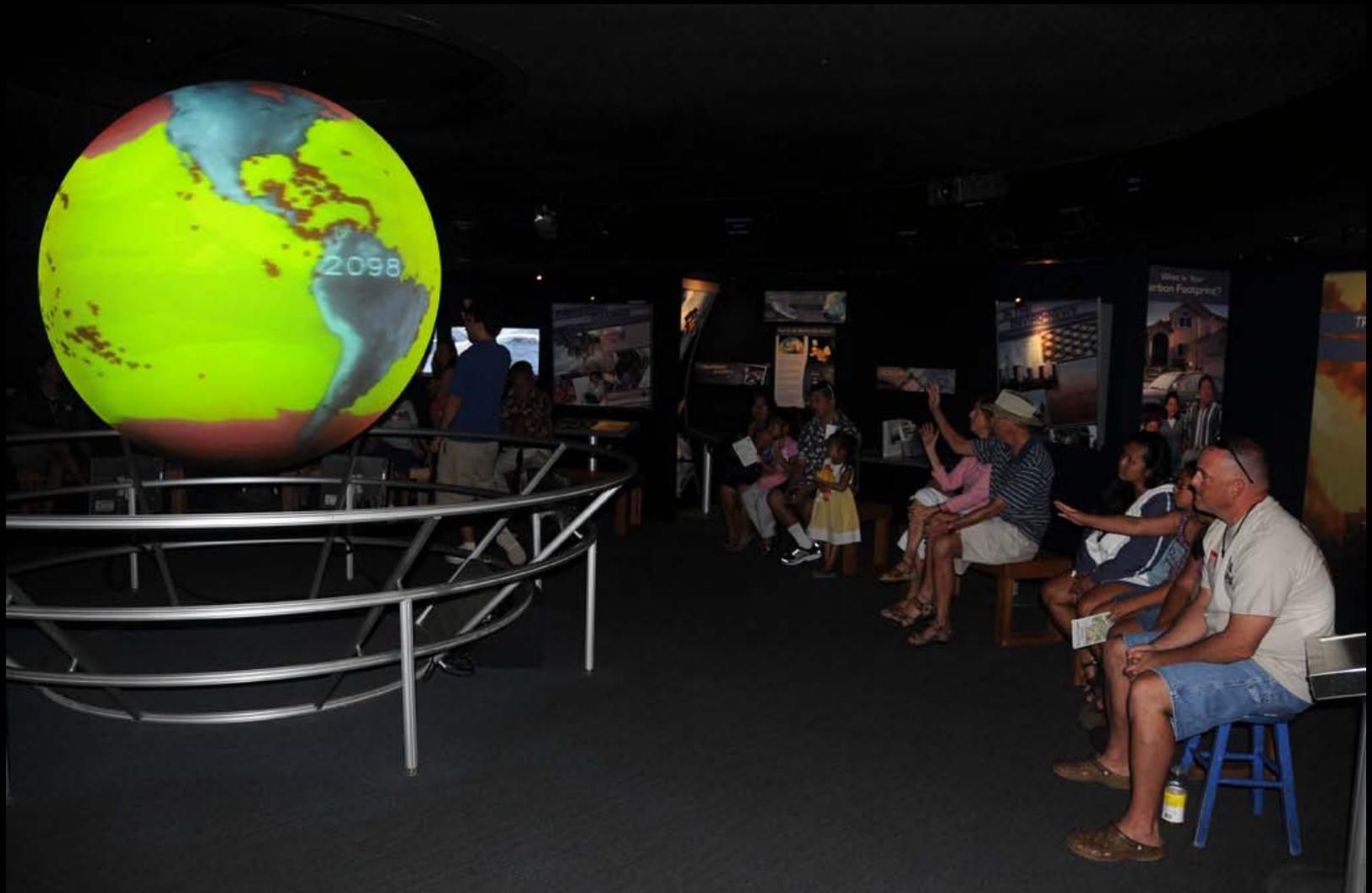
E. DISEASE INFORMATION

Types of Corals affected? (Table 2)	Lesion type?
Smooth Coral (<i>Porites</i>)	Tissue Loss
Mounding (<i>P. lobata</i>)	Growth Anomaly
Finger (<i>P. compressa</i>)	Discoloration
Plating (<i>P. rus</i>)	
Rice Coral (<i>Montipora</i>)	
Red rice (<i>M. capitata</i>)	
Blue rice (<i>M. flabellata</i>)	
Tan/Purple rice (<i>M. patula</i>)	Percent of coral affected?
Distinct Branching Coral (<i>Pocillopora</i>)	0%
Cauliflower (<i>P. meandrina</i>)	1-10%
Lace (<i>P. damicornis</i>)	11-30%
Antler (<i>P. eydouxi</i>)	31-50%
Other (specify)	51-75%
	76-100%

F. CROWN-OF-THORNS INFORMATION

Types of Corals affected?	Estimated number of animals?
Smooth Coral (<i>Porites</i>)	1-50
Mounding (<i>P. lobata</i>)	51-100
Finger (<i>P. compressa</i>)	101-250
Plating (<i>P. rus</i>)	251-500
Rice Coral (<i>Montipora</i>)	501-1000
Red rice (<i>M. capitata</i>)	1001-3000
Blue rice (<i>M. flabellata</i>)	3000+
Tan/Purple rice (<i>M. patula</i>)	
Distinct Branching Coral (<i>Pocillopora</i>)	
Cauliflower (<i>P. meandrina</i>)	
Lace (<i>P. damicornis</i>)	
Antler (<i>P. eydouxi</i>)	
Other (specify)	

SOS Intro for Citizen Science



Applications

- School and public programs
- University students creating maps for climate class on SOS kiosk
- Science Cafe lectures (often non-linear)
- Senate Hearing on Climate Change (various emission scenarios)
- Citizen Science post-wrap on SOS
 - local to global

Contact

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