

# 2015 Science On a Sphere® Users Collaborative Network Workshop Program

BIG IDEAS  
BIG RESOLUTION  
BIG DATA  
BIG CHANGES  
BIG SYSTEMS

## THINK BIG

Oregon Museum of  
Science & Industry  
Portland, OR

Dec 2-4, 2015



**OMSI**



NATIONAL  
MARINE  
SANCTUARY  
FOUNDATION

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## Welcome to the 7<sup>th</sup> Science On a Sphere® Users Collaborative Network Workshop!

We have another workshop with a great mix of topics, over 3 dozen presentations led by your fellow Workshop attendees, and a great big Workshop theme to encompass it all and represent the scale of things out here in the West, “Think BIG: Big Changes, Big Systems, and Big Data in the 21st Century.” We hope these Workshop offerings meet your needs and expectations. You’ll have a chance to tell us if they did on the post-Workshop survey.

Also, we hope you’ll take advantage of the less structured parts of the agenda to interact with your fellow attendees. There is quite a diversity of expertise here with us. There are over 100 attendees from 6 different countries representing more than 50 institutions, including educators, visualizers, scientists, exhibit designers, movie producers, and technologists. So, we hope you will take advantage of the breaks and social times to meet some new people.

NOAA has enjoyed, tremendously, working with the Oregon Museum of Science and Industry to bring you this Workshop. OMSI has been actively involved with the SOS Network since 2009 and they are looking forward to showing us how the Portland DIY approach is brought to bear on a science museum.

As you participate in the Workshop this week, keep the goals in mind. If you think we’re not achieving these well, let us know. The Workshop goals are:

- Improve effectiveness of each institution’s use of SOS and other spherical platforms;
- Evolve best practices for content creation and interpretation;
- Expand the breadth of approaches for engaging the public with science through spherical display systems;
- Understand the impact spherical display systems have on learning Earth system science in informal science education settings;
- Continue to inform the future direction of the SOS Network, and;
- Continue to grow a cohesive and collaborative network that is actively sharing information, expertise, and content.

Finally, as with any workshop, there are many players that make the Workshop come together. This year, we’ve had the pleasure of working with the Marriott Residence Inn Portland and OMSI’s Bon Appétit catering. Our sponsor, the National Marine Sanctuary Foundation is also an essential element that allows this Workshop to take place. Thanks to all of them for their efforts and support.

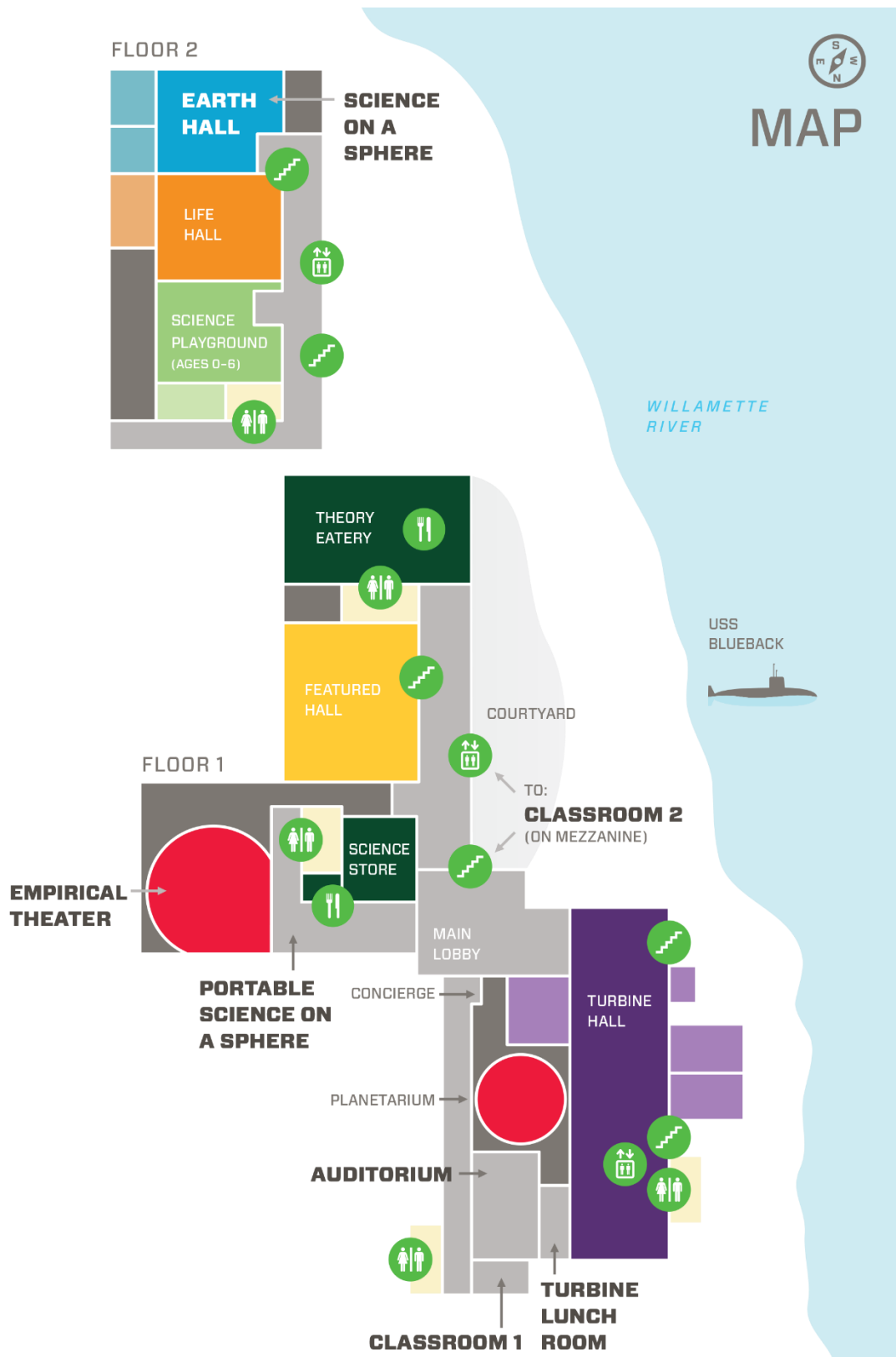
We hope you’ll enjoy, be inspired by, and try new things as a result of your time here with us.

Sincerely,

Your Workshop organizers,

Carrie McDougall, Erik MacIntosh, Patrick Drupp, Beth Russell, June Teisan, Sue Wu & Nate Lesiuk

# Oregon Museum of Science and Industry Floor Plans



## **Special Sessions and Networking Reception**

- Day 1: Reception at OMSI at 5:00 pm followed by complimentary admission to OMSI After Dark: Sounds of Science (Note: admission restricted to adults 21 yrs. and over, must have ID showing birthdate)
- Day 2: See the latest in commercial technologies from Pufferfish, iGlobe, and Global Imagination from 3:00 – 5:30 pm (Auditorium).
- Each day during lunch: Get your questions answered during a Q&A session with a member of the SOS development team (Auditorium).

## Agenda At-A-Glance – Day 1

Wednesday, December 2, 2015						
Time	Empirical Theater	Auditorium	Earth Hall-SOS	Theater Lobby-SOS	Classroom 1	Classroom 2
8:00 AM	Museum Open, Participants Arrive. Please check in by 8:30					
8:15 AM						
8:30 AM						
8:45 AM						
9:00 AM	Welcome Remarks					
9:15 AM						
9:30 AM						
9:45 AM	Updates from the SOS Team in Boulder					
10:00 AM						
10:15 AM						
10:30 AM						
10:45 AM	BREAK (30 min) - drinks and snacks in Auditorium					
11:00 AM						
11:15 AM	Keynote - Should I Stay or Should I Go? Tsunami Evacuation					
11:30 AM						
11:45 AM						
12:00 PM	LUNCH in Auditorium - food will be provided	First Time Out (Special session for SOS "newbies")				
12:15 PM		Lunchtime Q&A with the SOS Development Team				
12:30 PM						
12:45 PM						
1:00 PM			Real-Time Tsunami Forecast Animations	New SOS Technologies Demonstration-offered Wed. & Thurs.	Volunteers and Interns, oh my! Building an efficient training program	Beyond Playlists: SOS Production Strategies for Filmmakers
1:15 PM			The Orphan Tsunami			
1:30 PM						
1:45 PM						
2:00 PM			The recovery from 3.11 Tsunami	Quick-and-dirty SOS photo panoramas you can do yourself!	How to Use Non-English Languages in SOS	Experiences in Higher Education with SOS
2:15 PM						
2:30 PM			A Big Year for Little Worlds			
2:45 PM						
3:00 PM	BREAK (30 min) - drinks and snacks in Auditorium					
3:15 PM						
3:30 PM			New Ocean Acidification Model Projections	Automating Your Alignment: How to Get Started	Camps and Out of School Programs	Beyond the Script: Preparing Docents for Dynamic Interpretation
3:45 PM						
4:00 PM			Climate Change (PSC)			
4:15 PM						
4:30 PM			Climate Change (SMVF)			
4:45 PM						
5:00 PM	5:00 - 10:00 PM Reception and "OMSI After Dark" (21+)					

Panel/Plenary	NOAA SOS Team Update	SOS Showcase	How-To	Small Group
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## Agenda At-A-Glance - Day 2

Thursday, December 3, 2015						
Time	Empirical Theater	Auditorium	Earth Hall-SOS	Theater Lobby-SOS	Classroom 1	Classroom 2
8:30 AM	Museum Opens, Participants Arrive					
8:45 AM						
9:00 AM	Keynote - When does SOS work best?					
9:15 AM						
9:30 AM						
9:45 AM	Evaluation Panel					
10:00 AM						
10:15 AM						
10:30 AM	BREAK (30 min) - drinks and snacks in Auditorium					
10:45 AM						
11:00 AM	BIG IDEAS, small talks					
11:15 AM						
11:30 AM						
11:45 AM						
12:00 PM		LUNCH in Auditorium - food will be provided				
12:15 PM						
12:30 PM						
12:45 PM						
1:00 PM		Finally, SOS on your own computer: SOS Explorer	Become an Astrogeologist Class - offered Thu and Fri (space limited)			SOS as Multimedia Learning Resource
1:15 PM						
1:30 PM						
1:45 PM						
2:00 PM			Climate Bits	New SOS Technologies Demonstration-offered Wed. & Thurs.	Making a Big Impact for the Little Ones	Creating OA content for the sphere and choosing color palettes
2:15 PM						
2:30 PM						
2:45 PM			Visualizing Change: Climate Heart			
3:00 PM		BREAK (30 min) - drinks and snacks in Auditorium				
3:15 PM						
3:30 PM	Vendor Showcase		Made in Hong Kong		A Preview of the Visual Playlist Editor	SITI at the Aquarium of the Pacific: As the Sphere Turns
3:45 PM			Presenting a Global View of Migration			
4:00 PM			Unleashing the SOS as a Teaching and Learning Tool	The iPad SOS Remote App: An Overview of Recent and New Capabilities	Exploring approaches to using new technology	Telling a Story with your Sphere
4:15 PM						
4:30 PM						
4:45 PM			Creating Informative Stories with SOS			
5:00 PM						
5:15 PM						
5:30 PM	ADJOURN MEETING					

Panel/Plenary	NOAA SOS Team Update	SOS Showcase	How-To	Small Group
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## Agenda At-A-Glance - Day 3

Friday, December 4, 2015						
Time	Empirical Theater	Auditorium	Earth Hall-SOS	Theater Lobby-SOS	Classroom 1	Classroom 2
8:30 AM	Museum Opens, Participants Arrive					
8:45 AM						
9:00 AM	Keynote - Putting Paleoclimatology in the Public Eye					
9:15 AM						
9:30 AM						
9:45 AM						
10:00 AM	BREAK (30 min) - drinks and snacks in Auditorium					
10:15 AM						
10:30 AM	Visualizing Change: A How-To on connecting audiences to climate change and community solutions		Become an Astrogeologist Class - offered Thu and Fri (space limited)			Getting the most out of your Sphere: Creating a complete educational experience through hands-on STEM activities
10:45 AM						
11:00 AM						
11:15 AM						
11:30 AM						
11:45 AM		How to Connect to your Audience Through Film				
12:00 PM		LUNCH in Auditorium - food will be provided				
12:15 PM						
12:30 PM	Lunchtime Q&A with the SOS Development Team					
12:45 PM						
1:00 PM			Sunny and Friends		A Narrative-based Kiosk for your Sphere	SOS Software: Feedback and Future Directions
1:15 PM						
1:30 PM						
1:45 PM			The Latest in Real-time & Astronomy Data Sets			
2:00 PM			Creating Maps with Kids		Customizing the NOAA SOS Public Kiosk	Research-based Strategies for Engaging Public
2:15 PM						
2:30 PM		Closing Remarks				
2:45 PM						
3:00 PM						
3:15 PM						
3:30 PM	ADJOURN MEETING					

Panel/Plenary	NOAA SOS Team Update	SOS Showcase	How-To	Small Group
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## Daily Schedule

### Day 1 – Wednesday, December 2, 2015

8:00 AM	Registration, check in	<i>Lobby</i>
9:00 AM	<b>Welcome &amp; Introductory Remarks from the Oregon Museum of Science and Industry and NOAA</b> Nate Lesiuk, Nancy Stueber, Carrie McDougall & Christos Michalopoulos	<i>Empirical Theater</i>
9:45 AM	<b>Updates from the SOS Team in Boulder</b> John Schneider & SOS Development Team	<i>Empirical Theater</i>
10:45 AM	BREAK – Drinks and snacks served	<i>Auditorium</i>
11:15 AM	<b>KEYNOTE: Should I Stay or Should I Go? Tsunami Evacuation for the Cascadia Subduction Zone event</b> Dr. Dan Cox	<i>Empirical Theater</i>
12:00 PM	LUNCH – Food and drink served	<i>Auditorium</i>
12:00 PM	<b>Optional: First Time Out</b> (Special lunch-time session for SOS “newbies”) Nicole Burt	<i>Turbine Lunch Room</i>
12:30 PM	<b>Optional: Lunchtime Q&amp;A</b> with an SOS Support Tech	<i>Auditorium</i>
1:00 PM	<b>New SOS Technologies Demonstration</b> Vincent Keller, Keith Searight, Tony Liao, Shilpi Gupta	<i>Theater Lobby</i> <i>SOS</i>
1:00 PM	<b>Volunteers and Interns, oh my! Building an efficient training program that increases recruitment and retention</b> Tracy Thomas and Nick Corcoran	<i>Classroom 1</i>
1:00 PM	<b>Beyond Playlists: SOS Production Strategies for Filmmakers</b> Michael Starobin	<i>Classroom 2</i>
1:00 PM	SOS Showcase	<i>Earth Hall</i> <i>SOS</i>
	<b>Real Time Tsunami Forecast Animations</b> Nate Becker, Leon Geschwind	
	<b>The Orphan Tsunami</b> Sue Wu	

**The recovery from 3.11 Tsunami**

Mayumi Chiba

**A Big Year for Little Worlds**

Darrin Gunkel

2:00 PM	<b>Quick-and-dirty SOS photo panoramas you can do yourself!</b> Nate Becker, Leon Geschwind	<i>Theater Lobby SOS</i>
2:00 PM	<b>How to Use Non-English Languages in SOS</b> Keith Searight, Tony Liao	<i>Classroom 1</i>
2:00 PM	<b>Experiences in Higher Education with SOS</b> David Reagan	<i>Classroom 2</i>
3:00 PM	BREAK —Snacks & drinks served	<i>Auditorium</i>
3:30 PM	SOS Showcase	<i>Earth Hall SOS</i>
	<b>New Ocean Acidification Model Projections</b> Pat Drupp	
	<b>Climate Change</b> David Cuomo (Pacific Science Center)	
	<b>Climate Change</b> David Olli (Science Museum of Virginia)	
3:30 PM	<b>Automating Alignment: How to Get Started</b> Ian McGinnis	<i>Theater Lobby SOS</i>
3:30 PM	<b>Camps and Out of School Programs</b> Jennifer Young	<i>Classroom 1</i>
3:30 PM	<b>Beyond the Script: Preparing Docents for Dynamic Interpretation</b> Zeta Strickland, Emily Yam, Allie LeBeau, Sue Wu	<i>Classroom 2</i>
5:00 PM	Reception and “OMSI After Dark” (21+)	

## Day 2 – Thursday, December 3, 2015

8:30 AM	Museum Opens	<i>Lobby</i>
9:00 AM	<b>Keynote: When does it work best? Reflections on SOS from the learning perspective.</b> Dr. Martin Storksdieck	<i>Empirical Theater</i>
9:45 AM	<b>Evaluation Panel</b>  <b>Evaluation of the EarthNow Project</b> Dan Pisut  <b>Tiled Media Wall Displays: Experimental platforms for testing visitor comprehension of complex earth systems</b> Mary Miller  <b>When do spherical displays convey an advantage for understanding Earth science concepts?</b> Stephanie Uz	<i>Empirical Theater</i>
10:30 AM	BREAK – Drinks and snacks served	<i>Auditorium</i>
11:00 AM	<b>BIG IDEAS, small talks</b> Emily Yam, Dan Pisut, Alie LeBeau, Stephanie Long, Erik MacIntosh, Matt Brownell, John Schneider, Derek Balsilie	<i>Empirical Theater</i>
12:00 PM	LUNCH – Food and drink served	<i>Auditorium</i>
12:30 PM	<b>Optional: Lunchtime Q&amp;A</b> with an SOS Support Tech	<i>Auditorium</i>
1:00 PM	<b>Finally, SOS on your own computer: SOS Explorer (SOSx)</b> Eric Hackathorn, Hilary Peddicord	<i>Auditorium</i>
1:00 PM	<b>SOS as a Multimedia Learning Resource</b> Ian McGuire	<i>Classroom 2</i>
1:00 PM	SOS Showcase  <b>Become an Astrogeologist Class</b> Sue Wu, Jack Pollock, Ann Rodriguez  <b>Climate Bits</b> Stephanie Uz	<i>Earth Hall SOS</i>

	<b>Visualizing Change: Climate Heart</b> Kera Mathes	
2:00 PM	<b>New SOS Technologies Demonstration</b> Vincent Keller, Keith Searight, Tony Liao, Shilpi Gupta	<i>Theater Lobby SOS</i>
2:00 PM	<b>Making a Big Impact for the Little Ones</b> Patrick Rowley	<i>Classroom 1</i>
2:00 PM	<b>Creating OA content for the sphere and choosing color palettes</b> Dan Pisut, Erik MacIntosh, Pat Drupp	<i>Classroom 2</i>
3:00 PM	BREAK —Snacks & drinks served	<i>Auditorium</i>
3:00 PM	Vendor Showcase	<i>Auditorium</i>
	<b>Pufferfish</b> Jenny Putinski	
	<b>iGlobe</b> Mark Lalley	
	<b>Global Imagination</b> Jayme Jones	
3:30 PM	SOS Showcase	<i>Earth Hall SOS</i>
	<b>Made in Hong Kong</b> Kate Raisz, John Marciniak	
	<b>Presenting a Global View of Migration</b> Larry Flournoy	
	<b>Unleashing the SOS as a Teaching and Learning Tool</b> Darik Velez	
	<b>Creating Informative Stories with SOS</b> Thomas Quayle	
3:30 PM	<b>A Preview of the Visual Playlist Editor</b> Shilpi Gupta, Vincent Keller, Erik MacIntosh	<i>Classroom 1</i>
3:30 PM	<b>SITI at the Aquarium of the Pacific: As the Sphere Turns</b> Alie LeBeau	<i>Classroom 2</i>

4:30 PM	<b>The iPad SOS Remote App: An Overview of Recent and New Capabilities</b> Shilpi Gupta	<i>Theater Lobby SOS</i>
4:30 PM	<b>Exploring approaches to using new technology with SOS data for project based K-12 teaching</b> Michael Grossberg	<i>Classroom 1</i>
4:30 PM	<b>Telling a Story with your Sphere</b> Katie Hart, Nicole Killebrew	<i>Classroom 2</i>
5:30 PM	Meeting adjourns	

### Day 3 – Friday, December 4, 2015

8:30 AM	Museum Opens	Lobby
9:00 AM	<b>Keynote: Putting Paleoclimatology in the Public Eye</b> Jeremy Hoffman	Empirical Theater
10:00 AM	BREAK – Drinks and snacks served	Auditorium
10:30 AM	<b>Visualizing Change: A How-To on connecting audiences to climate change and community solutions.</b> Emily Yam, Nicole Killebrew, Katie Hart	Empirical Theater
10:30 AM	<b>Getting the most out of your Sphere: Creating a complete educational experience through hands-on STEM activities</b> Brian DeBates	Classroom 2
10:30 AM	SOS Showcase	Earth Hall SOS
	<b>Become an Astrogeologist Class</b> Sue Wu, Jack Pollock, Dwight Tanner	
	<b>How to Connect to Your Audience Through Film</b> Vicky Weeks	
12:00 PM	LUNCH – Food and drink served	Auditorium
12:30 PM	<b>Optional: Lunchtime Q&amp;A</b> with an SOS Support Tech	Auditorium
1:00 PM	<b>A Narrative-Based Kiosk for your Sphere</b> Toshi Komatsu	Classroom 1
1:00 PM	<b>SOS Software: Feedback and Future Directions</b> Keith Searight, Shilpi Gupta, Stephen Kasica	Classroom 2
1:00 PM	SOS Showcase	Earth Hall SOS
	<b>Sunny and Friends</b> Patrick Rowley	
	<b>The Latest in Real-time &amp; Astronomy Datasets</b> Steve Albers	
	<b>Creating Maps with Kids</b> Shilpi Gupta	

2:00 PM	<b>Customizing the NOAA SOS Public Kiosk</b> Keith Searight	<i>Classroom 1</i>
2:00 PM	<b>Research-based Strategies for Engaging Public</b> Celeste Frazier-Barthel	<i>Classroom 2</i>
2:30 PM	<b>Closing Remarks</b>	<i>Empirical Theater</i>
3:30 PM	Meeting Adjourns	



## Keynote Presentations

### Dr. Dan Cox

Professor of Civil Engineering, Oregon State University

#### Should I Stay or Should I Go?

#### Tsunami Evacuation for the Cascadia Subduction Zone event

11:15 am – 12:00 pm, Wednesday, December 2 – Empirical Theater

The Cascadia Subduction Zone (CSZ) is an extreme near-field tsunami hazard, threatening the life safety of communities along 1,000 miles of coastline from Northern California to Vancouver Island, Canada. It is only since the 1980s that the scientific community acknowledged the CSZ tsunami hazard, and our outdated emergency evacuation plans are based on decades-old assumptions of far-field tsunamis. Instead of hours for evacuation as previously thought, coastal residents and tourists must evacuate within 20 to 40 minutes immediately following intense ground-



shaking from the M9 CSZ earthquake. We will be confronted with a dizzying array of choices: Should I evacuate on foot or by car? Go it alone, or find friends and family first? What are our best chances for immediate survival – head for high ground a mile from the beach, or seek shelter at the top of the parking garage behind the hotel? Earthquakes and tsunamis are rare in the Pacific Northwest, leaving little memory of past events or culture of tsunami preparedness. Evacuations will be self-initiated, relying on an individual's perception of risk and knowledge of correct course of action. Unlike other natural disasters such as river floods, tornadoes, and hurricanes which are more easily imagined, the rarity of tsunami events in the U.S. make the tsunami scenario difficult to visualize, particularly in relation to a person's sense of place and evacuation plans, including preparation time and route choice. If someone is facing these choices for the first time during a real event, it may be too late. This talk presents recent results of an Agent Based Model for tsunami evacuation scenarios assuming a M9 CSZ event and shows how the confluence of personal choice, network disruptions caused by the earthquake, and tsunami arrival times can affect life safety.

**Biography:** Dr. Daniel Cox is a professor in the School of Civil Engineering at Oregon State University. His research focuses on coastal hazards resilience, looking at the interaction of tsunami and hurricane wave/surge hazards with the built and natural environments. He was awarded the Raymond C. Research Prize in 2015 by the American Society of Civil Engineers for his work on tsunami-induced forces and structural response, and he has provided US Senate testimony for tsunami preparedness. He spent a sabbatical year in Japan at the Disaster Prevention Research Institute from 2010-2011, and he made several field investigations after the 2011 Tohoku tsunami. He served on the ASCE Standards subcommittee for Tsunami Loads and Effects, and is currently working on several projects to increase community resilience to coastal hazards.

## **Dr. Martin Storksdieck**

Director, Center for Research on Lifelong STEM Learning, Oregon State University  
Professor, College of Education and School of Public Policy

### **When does it work best? Reflections on SOS from the learning perspective.**

9:00 – 9:45 am, Thursday, December 3 – Empirical Theater

Why are experiences with Science On the Sphere exciting for audiences, and potentially highly educative for students? What is it that makes SOS different from other forms of science engagement or science instruction? Why and in what way does the projection of scientific data and information on a six-foot sphere allow learners who experience the sphere to engage with particular science content in ways that are unique, motivating and support learning? In his talk, Martin Storksdieck will reflect on these questions, and offer hypotheses on the "value added" of SOS. Building on ideas of how SOS really "works" for audiences, Martin will derive some guidance on best practices on the use of SOS. The talk will provide a brief overview of the current state of knowledge around the best use of SOS, and impacts on its audiences, discuss the extension of SOS into formal instruction, provide suggestions for future research on the effectiveness of SOS, and address the implications of pedagogy on the underlying technology of SOS.



**Biography:** Martin Storksdieck, PhD, is the director of Oregon State University's Center for Research on Lifelong STEM Learning and a professor in the College of Education and the School of Public Policy. Prior to joining OSU, Martin directed the Board on Science Education at the National Research Council of the National Academy of Sciences. There he oversaw studies that addressed a wide range of issues related to science education and science learning in formal and informal environments, and provided evidence-based advice to decision-makers in policy, academia and educational practice. His own research focuses on what and how we learn when we do so voluntarily. This includes connections between school-based and out-of-school learning. Martin's research also focused on the role of science-based professionals and science hobbyists in communicating their passions to a broader public. He has previously worked for education research and environmental policy non-profits in Germany and the United States, and served as environmental science educator and producer at a planetarium. He holds Master's degrees in biology and policy, and a Ph.D. in education.

## Jeremy Hoffman

National Science Foundation Graduate Research Fellow, Oregon State University

### Putting Paleoclimatology in the Public Eye

9:00 – 10:00 am, Friday, December 4 – Empirical Theater

Human-caused changes to the Earth's climate system are now. How do the changes we've observed in the 20th century and predict into the future scale with Earth's geological record of past changes? How do we know that current changes are all that spectacular or worrisome? Effectively communicating the concepts and principles of Paleoclimatology can help illuminate this discussion. In this session, I'll share some of the techniques I've used or developed to communicate paleoclimatology to OMSI visitors and the public alike.



**Biography:** Jeremy is a National Science Foundation Graduate Research Fellow and Ph.D. candidate in Geology with a focus in Paleoclimatology in the College of Earth, Ocean, and Atmospheric Sciences at Oregon State University. Jeremy is also earning a Graduate Certification in Collegiate and University Teaching from Oregon State, and serves as an Oregon Museum of Science and Industry (OMSI) Science Communication Fellow and an NSF William Mitchell College of Law Effective Science Communication Fellow.

Jeremy's research works to resolve longstanding issues in paleoclimatology and paleoceanography by using low-temperature trace metal and stable isotope geochemistry, and statistical techniques for time-series analysis and alignment of proxy records. Jeremy's research interests include abrupt pre-human global climate change, foraminiferal geochemistry, glacial geology, and hydrosphere-cryosphere dynamics. Jeremy's teaching interests include face-to-face, online, and informal science course development. He has developed outreach activities spanning multiple geoscience topics and actively pursues opportunities to collaborate with educators from outside of earth science.

## Plenary and Panel Descriptions

### **Welcome and Introductory Remarks from the Oregon Museum of Science and Industry and NOAA**

Nate Lesiuk, OMSI

Nancy Stueber, OMSI

Carrie McDougall, NOAA Office of Education

Christos Michalopolous, NOAA Office of Education

9:00 – 9:45 am, Wednesday, December 2 – Empirical Theater

Workshop hosts, Nate Lesiuk, Senior Program Developer (OMSI); Nancy Stueber, President (OMSI); Dr. Carrie McDougall, Senior Program Manager (NOAA Education); Christos Michalopoulos, Deputy Director (NOAA Education) will provide welcoming remarks, a Workshop overview, and their perspectives on the field of informal science education and larger science education initiatives happening at the national level.

### **BIG IDEAS, small talks**

Emily Yam, Aquarium of the Pacific

Dan Pisut, NOAA

Alie Lebeau, Aquarium of the Pacific

Stephanie Long, Science Museum of Minnesota

Erik MacIntosh, NOAA

Matt Brownell, Denver Museum of Nature and Science

John Schneider, NOAA

Derek Balsilie, Aquarium of the Pacific

11:00 am – 12:00 pm, Thursday, December 3 – Empirical Theater

Join us for the Science On a Sphere® Network's first Lightning Talks Session! This session will feature a series of five-minute talks about the Network's big ideas: data visualizations, docent interpretation, inspiring action, and moving beyond the SOS platform.

### **PANEL: Evaluation**

9:45 – 10:30 am, Wednesday, December 3 – Empirical Theater

### **Evaluation of the EarthNow Project**

Dan Pisut, NOAA Environmental Visualization Laboratory

EarthNow is a 5-year NOAA grant focused on providing weather and climate visualizations and professional development resources for SOS docents. Over the course of the project, five evaluations of the SOS Network were conducted, ranging from assessments of real-time data use, attitudes towards professional development amongst docents, and effectiveness of using the resources in SOS programming. Highlights of these evaluations will be presented, along with thoughts on next steps for the Network.

## **Tiled Media Wall Displays: Experimental platforms for testing visitor comprehension of complex earth systems**

Mary Miller, Exploratorium

The Exploratorium has a large, nine-screen media wall that currently displays SOS-type global datasets, earth-systems models visualizations and other multimedia info-graphics on current environmental news. A small, in-house production team adapts global visualizations, creates new displays and curates a playlist for the media wall. There is considerable interest in understanding visitor engagement and learning with large-scale visualization of this kind, including whether authenticity in data sources is perceived as important to the visiting public. Additionally, these kinds of earth-systems visualization platforms (video walls, SOS) can be used experimentally by modifying and testing different approaches for GIS-based animations, including color schemes and brightness, flow patterns, and visual attention and perception in terms of visitor comprehension and cognitive load. This session would describe these evolving and experimental programs as well as future ideas for utilizing an interactive "10th screen" and planned visitor research programs on user understanding of large-screen data visualizations.

## **When do spherical displays convey an advantage for understanding Earth science concepts?**

Dr. Stephanie Uz, NASA Goddard Space Flight Center

We have conducted two exploratory studies comparing content on a spherical display and flat screen. In both cases, two identical populations were compared: one group saw a live SOS presentation and an identical group saw the same live presentation on a flat screen. In our initial study, there was a statistically significant 26% increase in test scores for both groups after the show, but no statistically significant difference between the sphere and flat screen groups. Differences in experiment controls, such as the noise level and mastery of English, appear to have had a bigger influence on content reception than whether the presentation was on the sphere or flat screen. Some of the advantages of each format were most apparent in the qualitative comments at the end of the surveys. Following that, we refined the study to standardize the setting and minimize extraneous variables. I present our new results here.

## **Closing Remarks**

Dr. Carrie McDougall, NOAA Office of Education  
2:30 – 3:30 pm, Friday, December 4 – Auditorium

## **NOAA SOS Team Updates**

### **Updates from the SOS Team in Boulder**

John Schneider and SOS Team, NOAA Science On a Sphere, Boulder, CO  
9:45 – 10:45 am, Wednesday, December 2 – Empirical Theater

John Schneider, the Chief of the Technology Outreach Branch, will introduce the members of the Science On a Sphere team in Boulder, highlight their recent accomplishments and discuss where the SOS team is taking SOS in the future. In addition, the SOS Development team will review new updates to the SOS platform, including SOS Explorer for flatscreens.

### **Lunchtime Q&A with the SOS Development Team**

Ian McGinnis, NOAA Boulder-Science On a Sphere  
Vincent Keller, NOAA Boulder-Science On a Sphere  
Stephen Kasica, NOAA Boulder-Science On a Sphere  
Eric Hackathorn NOAA Boulder-Science On a Sphere  
12:30 – 1:00 pm, Wednesday, Thursday, Friday, December 2-4 – Auditorium

- 1) SOS Technical Support Q&A with Vincent Keller and Ian McGinnis
- 2) SOS Website and Data Catalog Feedback with Stephen Kasica
- 3) SOS Explorer Exhibit Demo with Eric Hackathorn

### **New SOS Technologies Demonstration**

Vincent Keller, NOAA Boulder-Science On a Sphere  
Keith Searight, NOAA Boulder-Science On a Sphere  
Tony Liao, NOAA Boulder-Science On a Sphere  
Shilpi Gupta, NOAA Boulder-Science On a Sphere  
1:00 – 1:50 pm, Wednesday, Thursday December 2-3 – Theater Lobby SOS

4K vs 2K resolution projection system: Normal resolution data (2K) and high resolution (up to 16K) will be demonstrated on an SOS system that use two 2K projectors and two 4K projectors. This way, the different resolutions may be easily compared.

The Splitter: Demonstration of a visualization tool that allows a docent to replicate a wedge of the sphere, so a region of interest can be displayed to multiple viewer positions at the same time.

SOS Kiosk: Demonstration of a NOAA supported SOS kiosk that is configurable and includes a subset of the sphere controls. This kiosk adds support for language translations.



## **How to Use Non-English Languages in SOS**

Keith Searight, NOAA Boulder-Science On a Sphere

Tony Liao, NOAA Boulder-Science On a Sphere

2:00 – 2:50 pm, Wednesday, December 2 – Classroom 1

Localization of languages is now supported in the latest SOS release. The SOS team will provide training on how to create text translations for user interface controls and dataset information, load them into SOS applications, and configure the applications to use them. We will also discuss how you can share text translations with NOAA and other sites.

## **Automating Your Alignment: How to Get Started**

Ian McGinnis, NOAA Boulder-Science On a Sphere

3:30 – 3:50 pm, Wednesday, December 2 – Theater Lobby SOS

This session will cover the current state of auto alignment as well as how you can get started using auto alignment with your SOS system. If time (and technology) permits, there will be a demonstration of the current system. Feel free to bring any questions!

## **Finally, SOS on your own computer: SOS Explorer (SOSx)**

Eric Hackathorn, NOAA Boulder-Science On a Sphere

Hilary Peddicord, NOAA Boulder-Science On a Sphere

1:00 – 1:50 pm, Thursday, December 3 – Auditorium

In this session we will be demonstrating the educational use of SOS data visualizations within a new interactive Earth display for a flat screen personal computer coming out of the Science On a Sphere project (SOS), SOS Explorer. Examining data is a fundamental practice in science and a new priority in education. Environmental Science in particular relies on the understanding of scientific data to motivate people to lessen their contributions of human impacts on the Earth. Teachers have been asking for this for a long time. Now you have it to share with them!

## **A Preview of the Visual Playlist Editor**

Vincent Keller, NOAA Boulder-Science On a Sphere

Shilpi Gupta, NOAA Boulder-Science On a Sphere

Erik MacIntosh, NOAA Boulder-Science On a Sphere

3:30 – 4:20 pm, Thursday, December 3 – Classroom 1

This presentation will give you a jumpstart on how to use the new SOS Playlist Editor. While we will cover the creation presentation playlist briefly, this session is targeted mostly at users wishing to create custom datasets. The new playlist editor should simplify the inclusion of more complex SOS features, such as layers and pips, with its 'DataSet Preview' interface. We will also discuss the benefits of customizing datasets and playlists to improve SOS presentations.



### **The iPad SOS Remote App: An Overview of Recent and New Capabilities**

Shilpi Gupta, NOAA Boulder-Science On a Sphere

4:30 – 5:20 pm, Thursday, December 3 – Theater Lobby SOS

We will demonstrate the recent capabilities of the SOS Remote App from the last software release in March 2015, as well as show the newest SOS features supported by the iPad, including the "Splitter". We will describe the steps needed to make sure the SOS Data Catalog on the iPad is up-to-date, and discuss configuration options for other features. Time will be allotted for Q&A. This session is meant for anyone who uses the iPad SOS Remote App.

### **SOS Software: Feedback and Future Direction**

Keath Searight, NOAA Boulder-Science On a Sphere

Shilpi Gupta, NOAA Boulder-Science On a Sphere

Stephen Kasica, NOAA Boulder-Science On a Sphere

1:00 – 1:50 pm, Friday, December 4 – Classroom 2

Spend time with the SOS development team and provide feedback on the iPad and other SOS software, as well as your ideas on where the SOS software should be headed, including spherecasting and the website. Come and discuss with us what parts of our software are working well for you, what's missing or challenging, and what you'd like most to enhance SOS at your venue.

### **Customizing the NOAA SOS Public Kiosk**

Keath Searight, NOAA Boulder-Science On a Sphere

2:00 – 2:20 pm, Friday, December 4 – Classroom 1

A new NOAA Kiosk is now available with the latest SOS release. The SOS team will provide training on setting up and customizing the Kiosk, including defining groups and datasets, configuring the user interface, and displaying multiple languages. We will also go over how to operate the Kiosk and what equipment is needed.

## **Working Group and Discussion Descriptions**

### **First Time Out (for Newbies)**

Nicole Burt, Wings of Eagles Discovery Center and Elmira City Schools

12:00 – 1:00 pm, Wednesday, December 2 – Turbine Lunch Room (adjacent to Auditorium)

Are you new to SOS? Let's get together and brainstorm ideas and look at data sets that are great to use for SOS newbies. Grab your lunch and meet up in the Turbine Lunch Room.

### **Camps and Out of School Programs**

Jennifer Young, Science Central

3:30- 5:00 pm, Wednesday, December 2 – Classroom 1

Join the discussion about how Science On a Sphere can be utilized in camps and other out-of-school time programs. For the past two summers Science Central has turned over dataset development and the iPad to young teens who delve into the world of computer programming to cultivate their own Sphere presentation on topics of their choice. The week culminates in exciting camper-led demonstrations for family, friends and the general public. Additionally, we have partnered with the Department of Defense's STARBASE, IN camps and Girls RISEnet camps to combine Science On a Sphere programming and hands-on activities to enhance learning. We will explore best practices and lessons learned as we turn Science On a Sphere over to the next generation.

### **Beyond the Script: Preparing Docents for Dynamic Interpretation**

Zeta Strickland, Pacific Science Center

Emily Yam, Aquarium of the Pacific

Allie LeBeau, Aquarium of the Pacific

Sue Wu, Oregon Museum of Science and Industry

3:30- 5:00 pm, Wednesday, December 2 – Classroom 2

Across the network, institutions use docents to interpret with Science On a Sphere® in a diversity of ways, from engaging with audiences about current events, to more informal discussions about earth systems. In this session, presenters will share how their sites have prepared docents to interpret and present programs. With a focus on the variety of staffing models and the different types of programs, this session will have something for everyone. The session will end with a group discussion with participants about network-wide needs, challenges, and resources that can support best practices in professional preparation.

## **SOS as a Multimedia Learning Resource**

Ian McGuire, Detroit Zoological Society

1:00 – 1:50 Thursday, December 3, Classroom 2

A facilitated group discussion that focuses on Science On a Sphere as a tool for educators mentoring interns in multimedia production. Briefly explore how SOS helps us generate excitement in Detroit area High School, Undergraduate, and Graduate students from multiple disciplines. Bring your institutions hopes, challenges, and questions about similar programming and participate in the discussion.

## **Making a Big Impact for the Little Ones**

Patrick Rowley, James E Richmond Science Center, Charles County Public Schools

2:00 – 2:50 pm, Thursday, December 3, Classroom 1

While there are many data-rich, visually-stunning datasets and visualizations for the Science On a Sphere, there seems to be a lack of little-kid-friendly visualizations. What are little-kid-friendly visualizations? That's a big part of what we hope to answer during this working group session.

Some initial thoughts:

- Animate existing datasets like the Sun or the Earth
- Create quiz-style datasets with multiple choice options ""printed"" right on the SOS with fun colors
- Create datasets that allow children to communicate with characters on the SOS

Some of these ideas may already exist; that's great! If you've developed such datasets, please come and share them with the group.

Working Group Goals:

- Determine what little-kid-friendly datasets are
- Determine whether some of those already exist
- Identify some little-kid-friendly datasets we'd like to see
- Identify SOS sites and/or content creators that can develop some of those.

## **SITI at the Aquarium of the Pacific: As the Sphere Turns**

Alie LeBeau, Aquarium of the Pacific

3:30 – 4:20 pm, Thursday, December 3, Classroom 2

What's the latest with the Aquarium's IMLS funded professional development project? SITI (Spherical Interpretation and Technology Integration) continues along as we move into the final year of the professional development grant, and staff at the levels of the Education Department using the sphere as a tool of inquiry and connecting them with the beautiful Aquarium-produced films. Strategies have changed and evolved and new opportunities abound. What challenges still exist? What lessons can we share? Join us for an interactive discussion about the current activities of our project and our plans for continuing to influence how network users facilitate conversations with SOS.

## **Exploring approaches to using new technology with SOS data for project based K-12 teaching**

Michael Grossberg, City University of New York

4:30 – 5:20 pm, Thursday, December 3, Classroom 1

NOAA-CREST centers has multiple programs for high-school level education. While these programs typically involve some in class instruction. We have embraced a projects-based approach where students get experience working with data. SOS data currently provides visualization for many earth and atmospheric data sets. Some data can now be visualized without a SOS installation through SOS explorer (SOSx). In addition, we have had students create visualizations of SOS data in a web-based 3D environment, which can be experienced using the new Virtual Reality headsets such as the Oculus Rift. In addition, we have used web based IPython notebooks in our classes to teach basic data science skills and for students to do experiments for their projects. The question we want to discuss is how can we create examples and support for training educators to use these tools to leverage SOS data sets, allowing students to learn about the earth, weather and climate through compelling projects.

## **Research-based Strategies for Engaging Public Audiences**

Celeste Frazier-Barthel, Oregon State University  
2:00 – 2:20 pm, Friday, December 4, Classroom 2

Many scientists are guided by a deep conviction of the worth and dignity of the advancement of knowledge. The ultimate responsibility to their subject is to seek and to state the truth as they see it. Scientists devote their resources to developing their scholarly competence and accept the obligation to exercise critical self-discipline in using, extending and transmitting knowledge.

Scientific communication is shaped by education and participation in the peer process through which scientists are apprenticed into particular communities of practice. Scientists are tasked to share their knowledge with educators, and the general public. This requires working with different communities of practice and different practices of communication, none of which are included in the training to become a scientist. As scientists cross these boundaries, normative practices, rules, and roles that are imbedded within the community of practice become apparent. Individual scientists must learn to manage these boundary crossings.

Evidence of impacts of participation of three case studies each which involves scientists working with educators, communicators and the general public: 1) Scientists working with a national network to create museum exhibits 2) Scientists managing a large citizen science program 3) Agency scientists redeveloping web tools for public audiences will be discussed.

## How-To Descriptions

### **Volunteers and Interns, oh my! Building an efficient training program that increases recruitment and retention**

Tracy Thomas, The Wild Center

Nick Corcoran, The Wild Center

1:00 – 1:50 pm, Wednesday, December 2 – Classroom 1

The Wild Center relies heavily on volunteers to assist in programming. We faced initial challenges getting volunteers to use the sphere - older volunteers were concerned about the technical aspects and younger volunteers were nervous about talking to large crowds. Everyone was concerned that they had to memorize all 400+ datasets. We have worked to overcome these challenges and have had volunteers as young as 12 and as old as 80 try their hand at a sphere program. In this session we will share how to overcome fears, engage volunteers, and train them (even short term volunteers and interns) to lead high quality programs. We will also do group work to brainstorm ideas for involving volunteers in better reaching our audience and yours - so bring your thinking caps!

### **Beyond Playlists: SOS Production Strategies for Filmmakers**

Michael Starobin, NASA Goddard Space Flight Center

1:00 – 1:50 pm, Wednesday, December 2 – Classroom 2

Filmmaking requires expertise in a wide range of disciplines, technical as well as artistic. Spherical filmmaking only adds to the challenge. In this presentation we'll discuss strategies for developing successful cinematic SOS productions. Content will include practical guidance for treatment and script development, art direction, live action shooting techniques, CGI development, and notes on production software.

The goal of this presentation will be to help producers and directors develop content propelled by stories more than simply facts. In an era suffused with “Big Data”, storytelling becomes increasingly vital. Without good storytelling Big Data has the potential to overwhelm audiences and producers alike with lots of decontextualized information, rather than substantive and engaging experiences. In the service of successful storytelling, it's essential for content creators to be conversant with the technical as well as communicative strategies for presenting compelling content.

Participants will be encouraged to share their own pre-production ideas and creative challenges as learning experiences for the group as well as affording themselves the opportunity for getting new insights on how to move forward.

### **Quick-and-dirty SOS photo panoramas you can do yourself!**

Nate Becker, NOAA Pacific Tsunami Warning Center  
Leon Geschwind, NOAA Office for Coastal Management  
2:00 – 2:50 pm, Wednesday, December 2 – Theater Lobby SOS

Recent developments in software and hardware have made it ever easier to generate spherical photographic panoramas for SOS exhibits. In addition to free, off-the-shelf software that allows one to make such panoramas, cell-phone camera apps and inexpensive spherical cameras can generate sphere-ready images or even video that one can easily manipulate, annotate, and display on SOS systems. We encourage anyone attending this session to bring their smart phone so we can teach them how to make such images themselves and display them on SOS.

### **Experiences in Higher Education with SOS**

David Reagan, Indiana University  
Patrick Beard, Indiana University  
2:00 – 2:50 pm, Wednesday, December 2 – Classroom 2

Staff from Indiana University's Advanced Visualization Lab will present lessons learned from our initial 2.5 years supporting the use of SOS for research, education, and creative activity. We will discuss the challenges and opportunities of hosting SOS at a research university and then detail unique development efforts that go beyond traditional science. Such efforts include our use of real-time Google Analytics, streamgraphs for time-based visualizations, spherical panoramas, and art exhibits.

### **Creating Ocean Acidification content for the sphere and choosing color palettes**

Dan Pisut, NOAA Environmental Visualization Lab  
Erik MacIntosh, NOAA Silver Spring SOS  
Pat Drupp, NOAA Office of Education  
2:00 – 2:50 pm, Thursday, December 3 – Classroom 2

This how-to class will focus on using some basic tips and techniques in Photoshop and SOS playlist scripting to improve the educational value of your SOS datasets. We will cover aspects of color theory, labeling, contextualization, and layering data. The demonstration will include the workflow behind developing the new ocean acidification datasets, now available on NOAA View, the SOS data catalog, and on your system. Although attendees may watch, they are encouraged to bring a laptop with Photoshop. Instructional materials may be downloaded from <http://www.nnvl.noaa.gov/SOS/2015Workshop/Content.zip>



## **Telling a Story with your Sphere**

Katie Hart, Seattle Aquarium

Nicole Killebrew, Seattle Aquarium

4:30 – 5:20 pm, Thursday, December 3 – Classroom 2

Storytelling and effective narrative structure can help bring data visualizations to life. Through the Visualizing Change project, we have developed and tested four narratives designed to explain aspects of climate and ocean change using SOS datasets in a new way and on diverse platforms (both spherical and flat screen). By examining the evolution of one of these narratives, we can identify and discuss how storytelling and narrative structure helps our audiences truly understand the implications of the data, their connection to the story, and community level solutions that can have a positive impact on the issue.

This session will provide time to discuss some best practices for telling a compelling story using data visualizations, and will also touch on some of the challenges and opportunities in creating visualization-based presentations for users of both spherical and flat display systems.

## **Visualizing Change:**

### **A How-To on connecting audiences to climate change and community solutions.**

Emily Yam, Aquarium of the Pacific

Nicole Killebrew, Seattle Aquarium

Katie Hart, Seattle Aquarium

10:30 am – 12:00 pm, Friday, December 4 – Empirical Theater

Since the last Science On a Sphere® Users Collaborative Network Meeting, the NOAA-funded Visualizing Change project has been field testing four visual narratives on climate change, telling stories about extreme weather, ocean acidification, sea level rise, and the role of the ocean as the heart of earth's climate system. These narratives use values-based messaging to connect climate change and community-level solutions. Over the next year, project partners will host a series of trainings to disseminate these narratives.

In this sneak-preview training session, members of the team will present an overview of strategic framing, demonstrate how framing is used in one field-tested narrative, and provide tools that create opportunities for learners to begin their conversations on climate change and action.

## **Getting the most out of your Sphere: Creating a complete educational experience through hands-on STEM activities**

Brian DeBates, Space Foundation

10:30 am – 12:00 pm, Friday, December 4 – Classroom 2

Come see how the Space Foundation integrates technology and hands-on activities to create a holistic learning experience with their Science On a Sphere. The Space Foundation serves over 11,000 students each year through formalized field trip opportunities. We have developed dozens of topics and hundreds of hands-on activities all aligned to education standards. In this workshop, we will highlight several hands-on activities that can be performed in any environment, demonstrate technology extensions for Sphere presentations and present opportunities for further training on SOS and hands-on activity integration.

## **A Narrative-Based Kiosk for your Sphere**

Toshi Komatsu, The Lawrence Hall of Science/UC Berkely

1:00 – 1:50 pm, Friday, December 4 – Classroom 1

Through an NSF-Geosciences Education grant, the Lawrence Hall of Science has developed a new, narrative-based kiosk for the Science On a Sphere. The design hallmark of this kiosk is its focus, not on specific SOS datasets for visitors to explore, but the presentation of a story that is enhanced by connecting multiple datasets on the SOS. Flatscreen imagery and text on the kiosk provide background and local context for interpreting global visualizations. If you are interested in a kiosk for your SOS or want to try a new kiosk, I will be sharing evaluation results, lessons learned, and plans for the future. Our hope for this kiosk is to provide a happy medium between facilitated presentations (where staffing may be an issue) and autorun presentations (where visitor choices are limited).

## **SOS Showcase Descriptions**

### **Real Time Tsunami Forecast Animations for SOS**

Nate Becker, NOAA Pacific Tsunami Warning Center

Leon Geschwind, NOAA Office for Coastal Management

1:00 – 1:20 pm, Wednesday, December 2 – Earth Hall SOS

In 2014 for the first time a U.S. tsunami warning center created and issued a tsunami forecast model animation while the tsunami was still crossing an ocean. In addition to an animation made available on its YouTube channel, the Pacific Tsunami Warning Center (PTWC) also generated an animation for the Science On a Sphere (SOS) exhibit at the NOAA Inouye Regional Center. In this presentation, NOAA PTWC and Office for Coastal Management staff will discuss how we would like to repeat this process for future tsunamis such that any SOS exhibit in the user group network could show a tsunami animation in real time as well. We will also discuss how SOS docents will need to be prepared for this eventuality and how we can provide comparable animations for historic events to provide context for any future tsunami. Such background information will also include some basic tsunami science and history such as a 3-D anaglyph of global bathymetry.

### **The Orphan Tsunami**

Sue Wu, Oregon Museum of Science and Industry

1:30 – 1:50 pm, Wednesday, December 2 – Earth Hall SOS

In January of 1700, a tsunami hit the coast of Japan. Villagers were puzzled since the tsunami was not preceded by an earthquake. Follow the scientific detective story as scientists in Japan and the United States pieced together the clues to link the tsunami to a massive 9.0 earthquake in the Pacific Northwest. Will another 9.0 earthquake happen on the Cascadia Subduction Zone? Created for audiences ages 10 to adult.

### **The recovery from 3.11 Tsunami**

Mayumi Chiba, Discovery Center

2:00 – 2:20 pm, Wednesday, December 2 – Earth Hall SOS

Our city was heavily damaged by 3.11 Tsunami. To encourage people, especially school children, the SOS was installed here in Higashimatsushima. Normally, we show RT earthquakes, Japan Earthquake and Tsunami Wave Height-March 2011 and some data about Climate Change. We also show some exciting data such as Mars and Moon. As we want students to feel the necessity of English, we show short movies.

### **A Big Year for Little Worlds**

Darrin Gunkel, Oregon Museum of Science and Industry

2:30 – 2:50 pm, Wednesday, December 2 – Earth Hall SOS

Small objects were the big thing in solar system exploration in 2015. Missions to little worlds chalked up some impressive firsts: first landing on a comet, first spacecraft to orbit a dwarf planet, and our first look at a class of worlds we didn't even know existed 20 years ago. This Science On a Sphere demo takes us on a tour of those small worlds, and hopefully raises more questions than it answers! The demo's been growing and changing all year as new data pours in from the far corners of the solar system. It focuses on the role gravity plays in shaping our solar system and how observations can change perception. This presentation is geared toward docents.

### **New Ocean Acidification Model Projections**

Pat Drupp, NOAA Office of Education

3:30 – 3:50 pm, Wednesday, December 2 – Earth Hall SOS

New GFDL ocean acidification model projections from the latest IPCC models show pH, aragonite saturation state, and CO<sub>2</sub> flux into and out of the ocean from 1861-2100.

### **Climate Change**

David Cuomo, Pacific Science Center

4:00 – 4:20 pm, Wednesday, December 2 – Earth Hall SOS

Climate Change is a 20-minute live presentation designed for Science On a Sphere. In this show, visitors will use standard science practices such as planning an investigation and analyzing data to explore climate, carbon emissions, and climate change. Using hands-on props and interaction with a live science interpreter, they will learn about the difference between weather and climate, carbon cycles, effects of climate change and potential solutions.

## **Climate Change**

David Olli, Science Museum of Virginia Foundation

5:00 – 5:20 pm, Wednesday, December 2 – Earth Hall SOS

I will review the climate change SOS presentation our docents have been presenting to guests. The presentation contains three, 5-minute segments: Weather vs. Climate: What's the Difference, Climate Change and Heat-Trapping Gases and Climate Change and Sea Level Rise. We emphasize climate change is not just a global but local issue by informing guests what communities and everyday folks can do to reuse, reuse and recycle.

Next year we'll be developing new climate change science and resiliency scripts for the Sphere, our new \$2.5 million Dome (formerly Omnimax theater) as well as media productions for radio and television, lecture series, Preparathons, and more. Knowledge of climate change and resiliency is key to preparing Virginians to make well-informed decisions and take actions to protect life, property, and natural resources impacted by the direct and indirect effects of climate change.

## **Become an Astrogeologist Class**

Sue Wu, Oregon Museum of Science and Industry

Jack Pollock, Oregon Museum of Science and Industry

Ann Rodriguez, Oregon Museum of Science and Industry

Dwight Tanner, Oregon Museum of Science and Industry

1:00 – 2:00 pm, Thursday, December 3 – Earth Hall SOS

10:30 – 11:30 am, Friday, December 4 – Earth Hall SOS

Be prepared to get messy and hands-on. Experience a 1 hour OMSI class designed for grades 3rd - 8th. Create impact craters in flour, lava patterns with cake batter, and tidal forces with jello. Then look for evidence of craters, volcanos, and ice in our solar system using Science On a Sphere.

Maximum capacity 24 people

### **Climate Bits**

Stephanie Uz, NASA Goddard Space Flight Center  
2:00 – 2:20 pm, Thursday, December 3 – Earth Hall SOS

ClimateBits can be used to help people visualize Earth science concepts through large global data sets. This interagency resource is being created by NASA Goddard Space Flight Center, NOAA and the University of Maryland and was recently highlighted by NOAA Administrator Kathryn Sullivan at the White House back-to-school climate literacy event. These videos are being used as an educational resource (e.g. K-12 systems and Massive Open Online Courses) and can also be used for informal education, available to the general public through SOS and YouTube. Visualizing global data with annotations and hearing about a concept in a concise way helps students see the big picture. The ideas can then be reinforced through experiential and hands-on learning methods. An Earth system science playlist is demonstrated including several ClimateBits and a hands-on spectrophotometry activity teaches principles of light transmission and absorption through water, and how that principle is applied to the ocean (in situ and from space) to map the world's phytoplankton distributions.

### **Visualizing Change: Climate Heart**

Kera Mathes, Aquarium of the Pacific  
2:30 – 2:50 pm, Thursday, December 3 – Earth Hall SOS

Over the past year, the Visualizing Change Project team has been testing four visual narratives that help to connect the public to climate science and community-level solutions. In particular, Climate Heart has helped the public understand the centrality of the ocean in regulating earth systems. This interpreter-facilitated show highlights key components of the Visualizing Change model: visuals paired with strategically-framed messages, leading to a discussion on solutions.

### **Made in Hong Kong**

Kate Raisz, 42 Degrees North Media  
John Marciniak, BWC Visual Technology  
3:30 – 3:50 pm, Thursday, December 3 – Earth Hall SOS

This original program was commissioned by the Hong Kong Maritime Museum to celebrate Hong Kong's role in global trade and commerce, beginning with the colony's founding in 1842 right up to today. The program was the centerpiece of an exhibit featuring trade goods made in Hong Kong and was produced by Kate Raisz of 42 Degrees North Media. While the topic is history, the program uses new motion graphics techniques applicable to science content.

## **Presenting a Global View of Migrations**

Larry Flournoy, Earth Day Texas

4:00 – 4:20 pm, Thursday, December 3 – Earth Hall SOS

This presentation is to inform the SOS User group about a series of datasets being developed for general education as well as environmental awareness of the global nature of fauna.

Earth Day Texas currently has the only traveling SOS system outside of NOAA and NASA. It is dedicated to traveling to secondary schools and universities in Texas in order to enhance the education of our students about environmental issues by illustrating the interdependence of all the earth's components. Earth Day Texas has undertaken the development of an extended set of animal migration datasets. This project has grown out of a relationship with the Audubon Society and has moved beyond birds to include insects, mammals, reptiles, and other species.

The intent is to provide global level coverage of the paths followed during migration. Initially, the focus will be on North and South America but will move to Europe, Africa, and Asia as data is acquired. The products will include texture and time series datasets as well as MPEG4 movies. Examples will be shown of the initial datasets.

## **Unleashing the SOS as a Teaching and Learning Tool**

Darik Velez, St Paul's School

4:30 – 4:50 pm, Thursday, December 3 – Earth Hall SOS

At St. Paul's School, we have created a class that puts students behind the controls of our SOS. Students are given basic skills in content creation and are quickly creating content for use by teachers in all disciplines. One student has even created a new SOS computer control system to facilitate its use by non-specialist teachers. This presentation will display recent projects as well as describe the challenges and triumphs of using the SOS in a school setting.

## **Creating Informative Stories with SOS**

Thomas Quayle, Clark Planetarium

5:00 – 5:20 pm, Thursday, December 3 – Earth Hall SOS

As we focus this year on “Think BIG: Big Changes, Big Systems and Big Data in the 21st Century,” developing presentations into compelling stories is an important part of providing cohesive educational experiences. Presenting content such as native datasets and personalized media in an educational environment has the capacity to expose audiences to focused and intriguing concepts. Using a wide variety of media formats and datasets that dovetail to creatively link information in ways that tell specific stories can be challenging.

The NGSS (Next Generation Science Standards) have already begun this process by encouraging students to look more holistically at science curriculum and see all the crosscutting concepts. Science On a Sphere provides institutions with a tool that can take that concept a step further and show how global processes overlap to tell various stories. Clark Planetarium has produced over a dozen unique lessons that have reached nearly 100,000 students and educators in just three years while working to stay aligned with state curriculum requirements for grades K-12. In this session Clark Planetarium will engage attendees on ways to choose content and adapt presentations for a specific audience by using one of these in-house lessons as a model.

## **How to Connect to Your Audience Through Film**

Vicky Weeks, Verglas Media

11:30 – 11:50 am, Friday, December 4 – Earth Hall SOS

Many Americans do not agree with the well-accepted scientific consensus that global warming is real. And among those who believe in climate change, there is not always acknowledgement that humans are responsible, or that we can or should attempt to do something about it. How can we as a community of science communicators contribute to closing this belief-gap sufficiently to change behaviors, votes and ultimately policy? In the 130 years since the first moving pictures astounded audiences, filmmaking has evolved into a complex craft that has touched all of us. There’s a science to this art. And there’s no doubt: SOS also astounds first-time viewers. How can we use the tried-and-true techniques of filmmaking to hold our viewers’ attention, and encourage them to want to learn more?



### **Sunny and Friends**

Patrick Rowley, James E Richmond Science Center, Charles County Public Schools  
1:00 – 1:20 pm, Friday, December 4 – Earth Hall SOS

"Sunny & Friends" is an interactive Science On a Sphere production and field trip experience about Earth's seasons, produced by the James E. Richmond Science Center (JERSC) and Charles County Public Schools (CCPS), Maryland. Over 20,000 CCPS students visited the Science Center during the 2014-2015 school year, it's initial year of operation. "Sunny & Friends" is used primarily with our Kindergarten field trips, as well as Pre-K through 1st grade field trips from non-CCPS schools and organizations.

What makes "Sunny & Friends" special, especially for that age group, is its interaction with the facilitator and students. The animated characters, Sunny, Bolt, and Crystal, "talk" to the students and SOS facilitator, and the facilitator and students are able to respond.

### **The Latest in Real-time and Astronomy Datasets**

Steve Albers, NOAA/ESRL  
1:30 – 1:50 pm, Friday, December 4 – Earth Hall SOS

I will show a sampling of real-time datasets and astronomy datasets I've worked with both recently and over the years. The real-time datasets include weather models and earthquakes. The astronomy ones include the planets and all of their major moons. Feature name overlays are available for most objects. This is to help familiarize the SOS community with some of the content in the catalogue. Suggestions for new datasets can be considered.

If there's interest and time I can talk a bit about how these datasets were created, for example some use IDL software procedures written especially for this purpose.

### **Creating Maps with Kids**

Shilpi Gupta, NOAA Science On a Sphere Boulder  
2:00 – 2:20 pm, Friday, December 4 – Earth Hall SOS

In this content session, we will describe an activity where kids and other's who are interested can draw on a paper map and then have their map loaded onto SOS. We will cover ideas for map-drawing lessons, how to get the images onto SOS, and show the results of this activity from a Girls in Science Day event that was held at the Denver Museum of Nature and Science in February 2015.

## Vendor Descriptions

### Pufferfish

Jenny Putinski

Pufferfish, Inc. is the creator of the Puffersphere Touch Globe, an ultra-high resolution digital globe with a touch-enabled surface. This new technology lets visitors to use their fingers to move the globe in any direction with fluid motion and precise accuracy, providing a uniquely personal experience. Visitors can also click on waypoints to trigger pop-up media windows, or use swiping gestures to reveal underlying content layers.



Because the Puffersphere Touch Globe is compatible with the Science on a Sphere content library, it is the perfect complementary technology for an existing SOS installation. When visitors have the ability to touch and interact with the same content displayed on a nearby SOS system, they become more engaged with the exhibit, and the physical connection allows for greater sensory-based comprehension. Additional integration options are also being explored that would allow the Puffersphere Touch Globe to control the motion and content displayed on a connected SOS system, dramatically enhancing the way live presentations are delivered to audiences.

The Puffersphere Touch Globe is also compatible with Esri's ArcGIS Online platform, allowing institutions to use custom GIS maps, display live-updating information, and provide pinch-to-zoom functionality for street-level viewing.

Website: [www.pufferfishdisplays.com](http://www.pufferfishdisplays.com)

## **iGlobe**

Marc Lalley

iGlobe3D is our newest patented spherical display technology that engages the viewer with 3D imagery and innovative user interface software. Similar to our full spherical display, iGlobe-3D creates highly accurate representations of Earth, celestial bodies, or other interpretive content and has the added advantages of exceedingly high resolution, stellar performance in any lighting situation, and unmatched affordability. People enjoy viewing the iGlobe-3D because the picture is essentially perfect.



The secret behind the iGlobe3D is a special light diverging optical layer that mounts on an iMac display. These optics warp the appearance of 2D imagery depicted on the iMac display to appear as a 3D sphere floating in space with extremely accurate depth and perspective, without the need to wear special glasses. iGlobe3D must be seen to be fully appreciated.

### Features Include:

- Apple iMac computer and display
- Apple iPad wireless controller
- Custom iGlobe interface
- Ultra High Resolution
- Enhanced colorspace for vibrant colors
- Real Time Earth with 12 weather layers
- Over 300 NOAA and NASA Science On a Sphere content titles available
- Custom museum quality wall mounted or desktop display to meet your specific needs
- High brightness
- The only spherical display able to fully show animated solar data

Website: [www.iglobe.com](http://www.iglobe.com)

## Global Imagination

Jayme Jones

Global Imagination makes the Magic Planet global display system. Our Magic Planet systems for education and outreach are inexpensive complements to any SOS installation. They're conveniently portable, so they're ideal for when you want to take your datasets, exhibits and movies out to schools – they can increase your educational reach, as well as increase field trips back to your facility. They're also perfect for “loaner programs”, where you bring teachers or librarians in for training on your content, and they go back with a small global display of their own to share with their entire school or community. Magic Planet education and outreach systems are an affordable way to increase the reach and impact of your global education program.



Website: [www.globalimagination.com](http://www.globalimagination.com)