



Engaging the Public in Environmental Learning & Enhancing Scientific Collaboration: The National Oceanic and Atmospheric Administration (NOAA) in Second Life



“You can read about a tsunami in a textbook or you can experience one in a virtual world; I believe that experience has a greater impact.”

—Eric Hackathorn, NOAA’s Virtual Worlds Program Manager

Executive Summary:

“40 percent of the visitors to NOAA’s Second Life space didn’t know about the organization prior to visiting their virtual space, that’s an indication that NOAA is reaching a new international market. And, 94 percent of the visitors surveyed said they’d like to see NOAA expand in Second Life.

—Eric Hackathorn, NOAA’s Virtual Worlds Program Manager

The National Oceanic and Atmospheric Administration’s (NOAA) long-standing mission in real life is the same in Second Life—to create an informed society that understands the role of the ocean, coasts and atmosphere in the global ecosystem to make the best social and economic decisions. By incorporating Second Life into their multi-media communication and educational programs including inworld events and a vast array of immersive simulations and 3D exhibits, NOAA has found ways to reach new audiences in profound and meaningful ways. In fact, 40 percent of visitors to NOAA in Second Life reported that they hadn’t heard of the organization prior to their Second Life visit and 94 percent recommended that NOAA expand their virtual presence. And, the NOAA presence in Second Life extends beyond the borders of Second Life; over 47,000 YouTube viewers have watched NOAA’s inworld tsunami demonstration—a stunning and powerful experience for both viewers and visitors.



Experiencing Climate Change Inworld to Prevent it in the Real World

It's easy for some people to dismiss global warming as an abstract concept—something that might exist, but doesn't directly affect us. NOAA is painfully aware of the seriousness of climate change and has created



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a space in Second Life to really bring home the reality and scale of climate change and how it affects both people and the environment.

For example, let's consider melting polar icecaps and rising oceanic water levels. To help make the concept more real for the public, NOAA's Second Life space includes a glacier that melts before visitors' eyes to demonstrate some of the dramatic consequences of climate change. Unlike glaciers in the physical world that freeze and melt slowly in geologic time, this virtual glacier melts and reforms in moments. Visitors can then learn how this phenomenon affects other oceanic systems. In NOAA's "Okeanos" space, they can turn up the heat and watch the magnificent reds and pastels of the coral reef go gray, then a ghostly sterile white. By providing virtual

experiences NOAA is increasing public engagement with very real problems for greater educational impact.

NOAA also plays a critical role to help visitors understand the power of deadly tsunamis. They have created a tsunami simulation in Second Life where a giant tsunami wave takes shape, beginning with a ground shaking earthquake, and then crashes into a shorefront village. The video of this virtual tsunami, shot in Second Life, has also reached an Internet audience of over 47,000 viewers on YouTube.

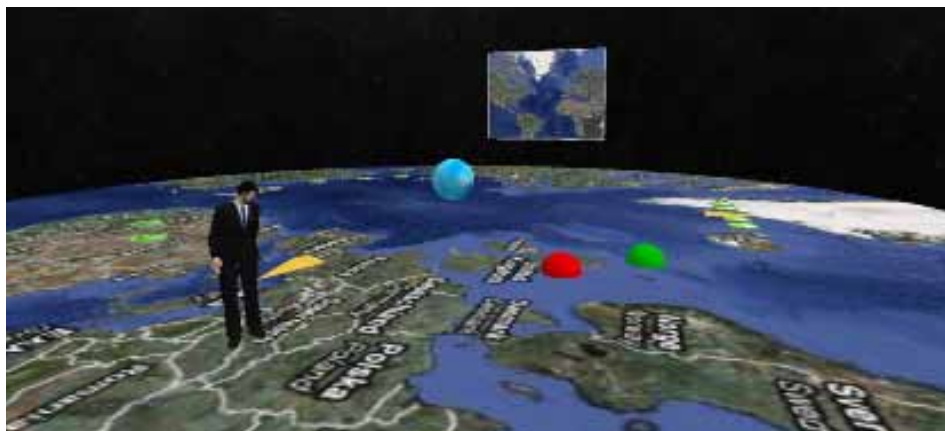
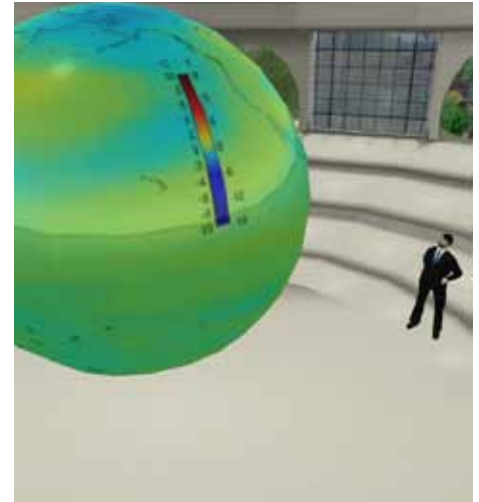
“You can read about a tsunami in a textbook or you can experience one in a virtual world,” says Eric Hackathorn, NOAA's Virtual Worlds Program Manager, “I believe that experience has a greater impact.”

Walking on Sunshine: Immersive Multi-Media Data Streaming of Real Time Weather

We've all watched the weather on the news for years and it's still a mysterious and elusive process for most of us. To help visitors understand weather in new ways, NOAA created a weather data visualization experience that combines Google maps with overlays of thousands of different weather-patterns to produce 3D models of weather maps with real time data and topographical detail. These immersive spaces enable visitors to walk across maps and watch real weather patterns appear and evolve across the Earth.



NOAA sees great potential for future use of these 3D overlay maps as important decision-making and information gathering tools for scientists to use when disaster strikes. These maps could allow meteorologists to simultaneously observe weather conditions and collaborate in real time on life saving action plans such as evacuation guidance and related communications.



it provides a view of the Earth from orbit just as astronauts see it from the moon. The real world SOS is supported with high-speed computers and projectors casting illuminated meteorological data onto the model planet. Duplicate SOS's will be installed in thirty-five global science and museum centers in 2009.

Leading the Way for Data Visualization in Science Education

NOAA's Second Life presence also promotes scientific discussion and provides visitors access to previously inaccessible parts of the environment. One example is the multi-media Science On a Sphere® (SOS) installation, which NOAA created first as a real world installation and then replicated as a virtual world exhibit.

The brainchild of Alexander "Sandy" MacDonald, Director of NOAA's Earth Systems Research Laboratory, SOS is a six-foot diameter physical model of Earth that hangs in mid-air, suspended by nearly invisible cables. To an observer



In 2008, NOAA developed a virtual SOS in Second Life. The virtual version was significantly less expensive to produce and maintain, and has the added benefit of reaching a global audience of Second Life visitors. It can



Links

Summary of NOAA's programs to educate the public on environmental issues:
<http://www.esrl.noaa.gov/outreach/>

To visit NOAA's islands in Second Life, visit Meteora:
<http://slurl.com/secondlife/Meteora/177/161/27/> and Okeanos:
<http://slurl.com/secondlife/Okeanos/64/217/30/>

be synchronized with displays on real world SOS exhibits, making it the only version that can simultaneously host visitors from around the world without requiring travel to share the experience. The SOS beautifully illustrates how the 3D modeling tools in Second Life can expand community engagement and help evolve real world best practices for scientific conversation and education.

NOAA Jumped into Second Life in 2006 and Continues to Expand and Inspire Others

When NOAA first considered virtual worlds, Hackathorn says, "Second Life was chosen because of its technical capabilities, huge potential audience, and its ability to offer visualization cheaply."

But, the decision didn't come without a few reservations. Hackathorn's supervisor, Bill Bendel, Chief of Earth System Research Laboratory (ESRL)

be affected by undesirable or disruptive visitors. The initial concern about security and inappropriate behavior has since been put to rest. "We've had no incidents," Bendel reported, crediting Hackathorn's leadership within the space for creating a strong, focused community.

From an initial seed investment, NOAA's commitment to Second Life has grown substantially. Today, the virtual world portion of NOAA's total education budget continues to grow because the investment continues to pay off in brand awareness and public education.

Now that NOAA is widely considered a Second Life pioneer and expert among government agencies, Hackathorn and Bendel are often approached by government agencies, such as the Department of Energy, to help them develop their own projects in Second Life. "I always maintain that the highest compliment is when someone is willing to pay us to help them develop their own project based on one of ours," Bendel said.

This harkens back to NOAA's primary goal and responsibility to create an informed society that understands the global ecosystem to make the best decisions. NOAA has blazed a trail for innovations in 3D data visualization to catalyze greater collaboration in the scientific community. And, the scientific community has not only taken notice, they're learning from NOAA and creating their own spaces in Second Life.



Technology Outreach Branch for NOAA, is pleased to see the organization reaching a broader international market through Second Life's global community. When Hackathorn first approached him with the idea to work in Second Life, Bendel said he hoped that the agency wouldn't



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About Second Life and Linden Lab:

Developed and launched by Linden Lab in 2003, Second Life is the world's leading 3D virtual world environment. It enables its users – known as Residents – to create content, interact with others, launch businesses, collaborate and educate. With a thriving inworld economy that saw over US\$360 million in user-to-user transactions in 2008, and a broad user base that includes everyone from consumers and educators to medical researchers and large enterprises, Second Life has become one of the largest hubs of user-generated content (UGC) in the world.

Linden Lab, founded in 1999 by Chairman of the Board Philip Rosedale and headquartered in San Francisco, develops revolutionary, immersive technologies that change the way people communicate, interact, learn and create. Privately held and profitable, Linden Lab is led by CEO Mark Kingdon, and has more than 300 employees across the U.S., Europe, and Asia.

Linden Lab

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