Virtual Worlds and NWS Operations

http://slidesha.re/vw-nws

Eric Hackathorn

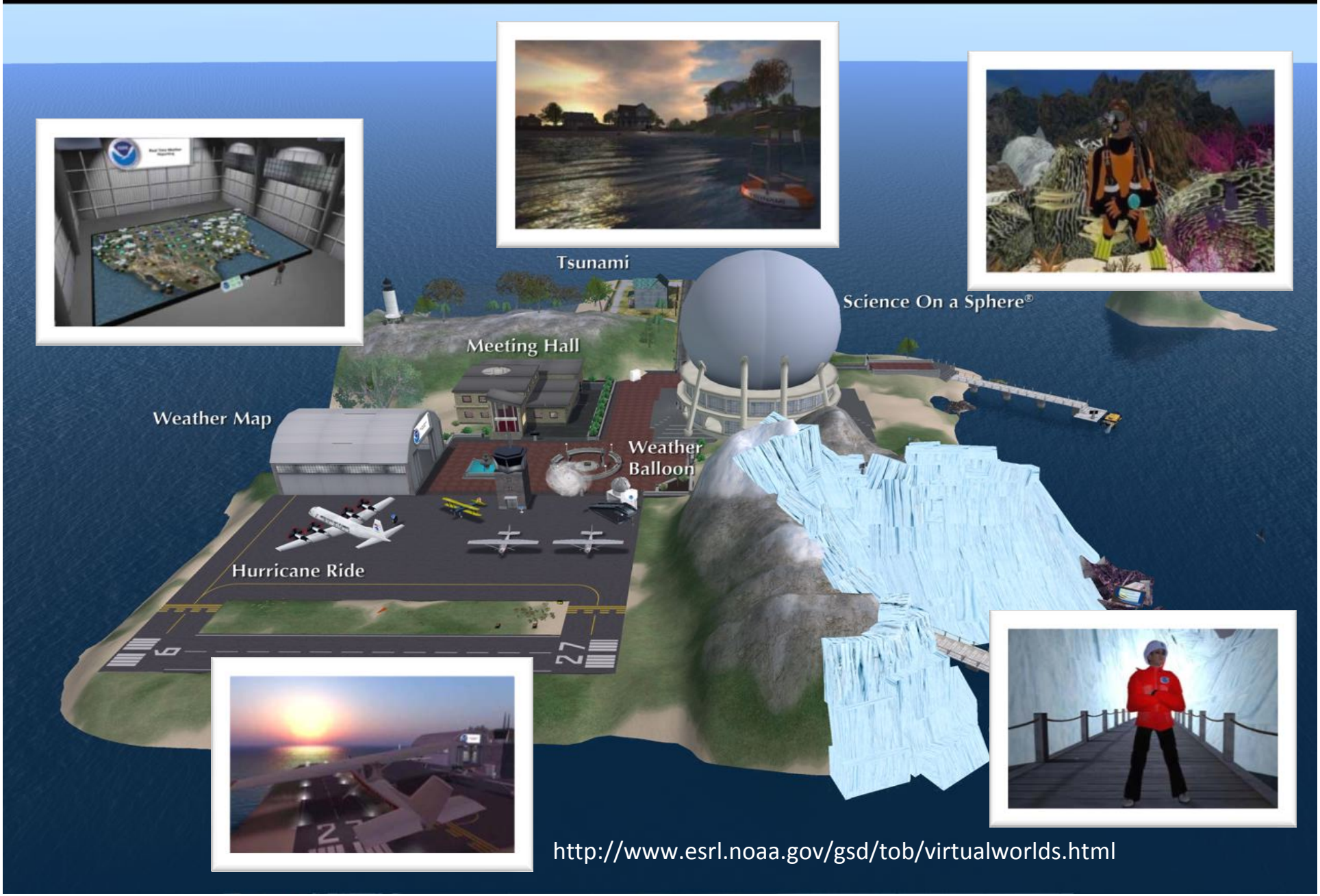
RITT Forum Presentation

February 16, 2011

what are virtual worlds?

3-D Visualizations	Social Interaction	Global Audience
• Immersive storytelling • Bringing NOAA's data and research to life	• Communication • Collaboration • Community	• Scalable experiences • Untapped market

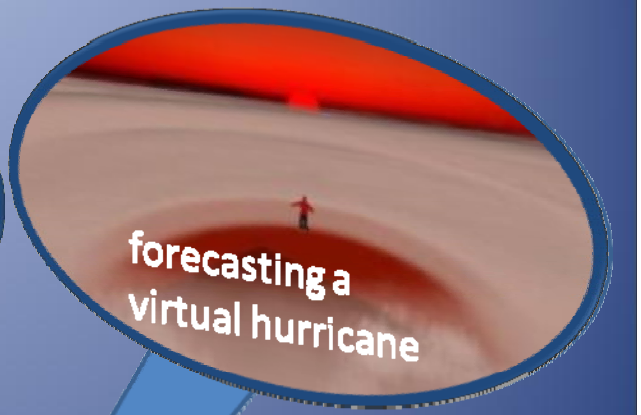
NOAA's Meteora Island in Second Life®



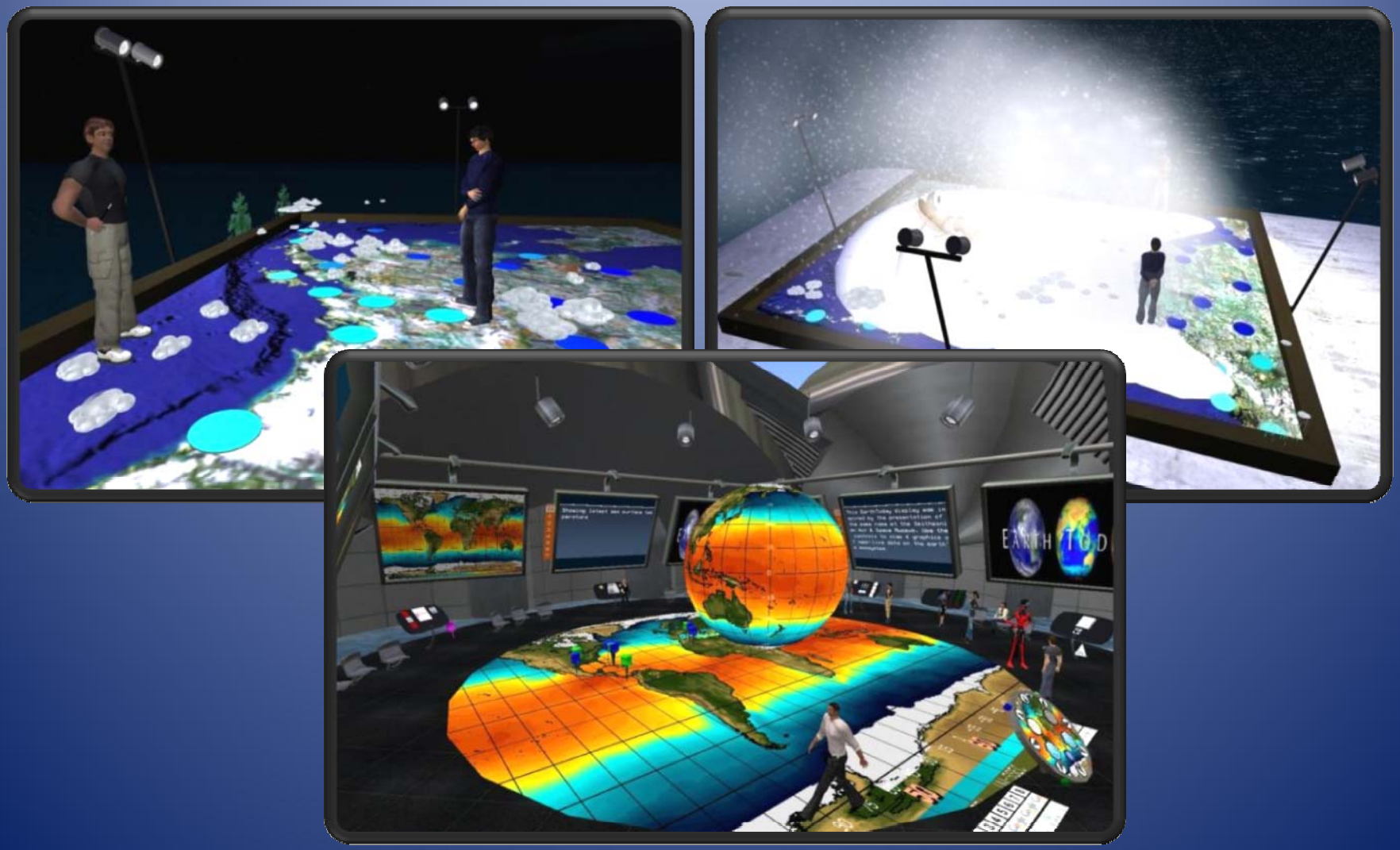
http://www.esrl.noaa.gov/gsd/tob/virtualworlds.html

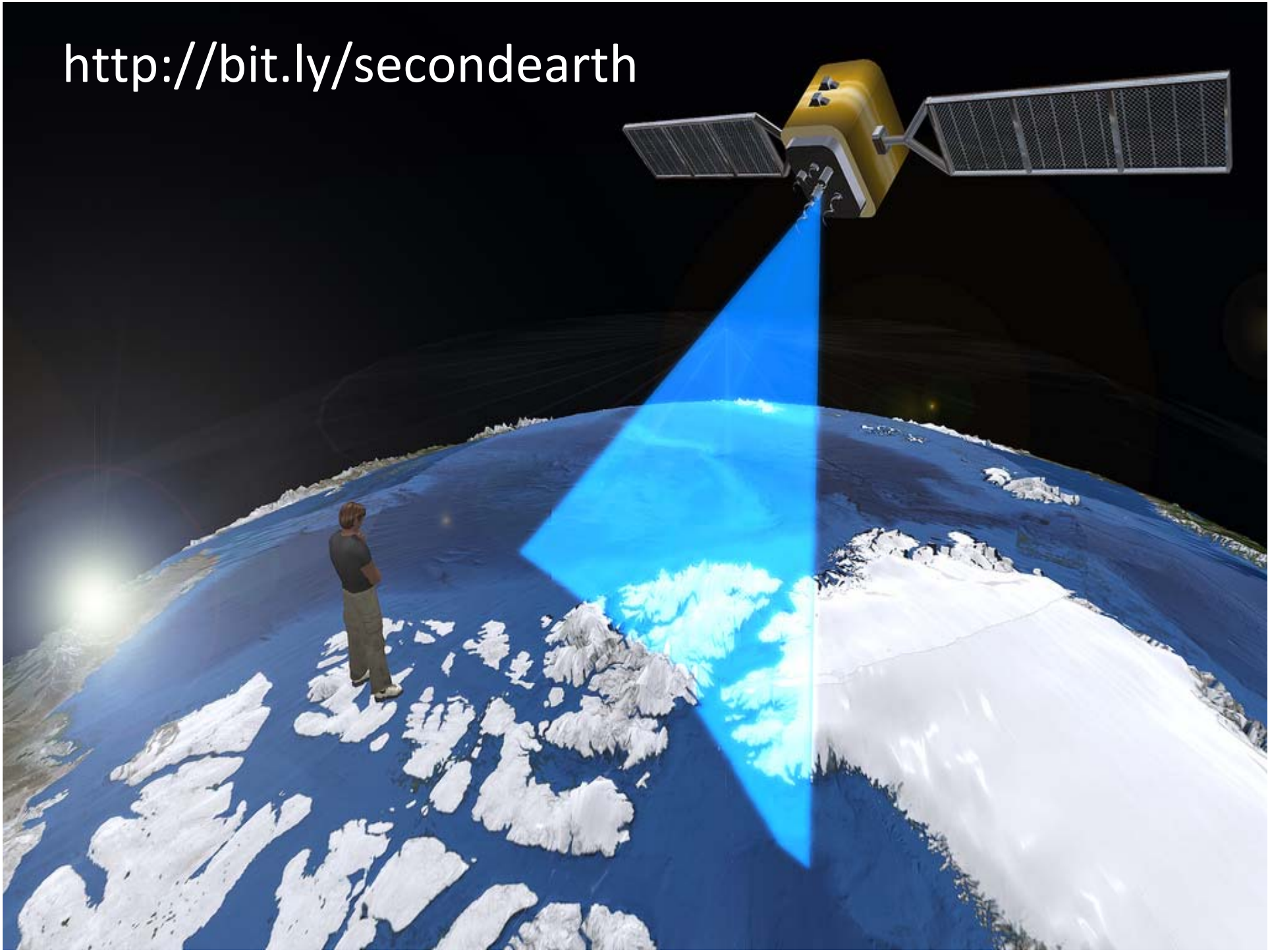
http://bit.ly/vgov
vGov

mitigating societal impacts



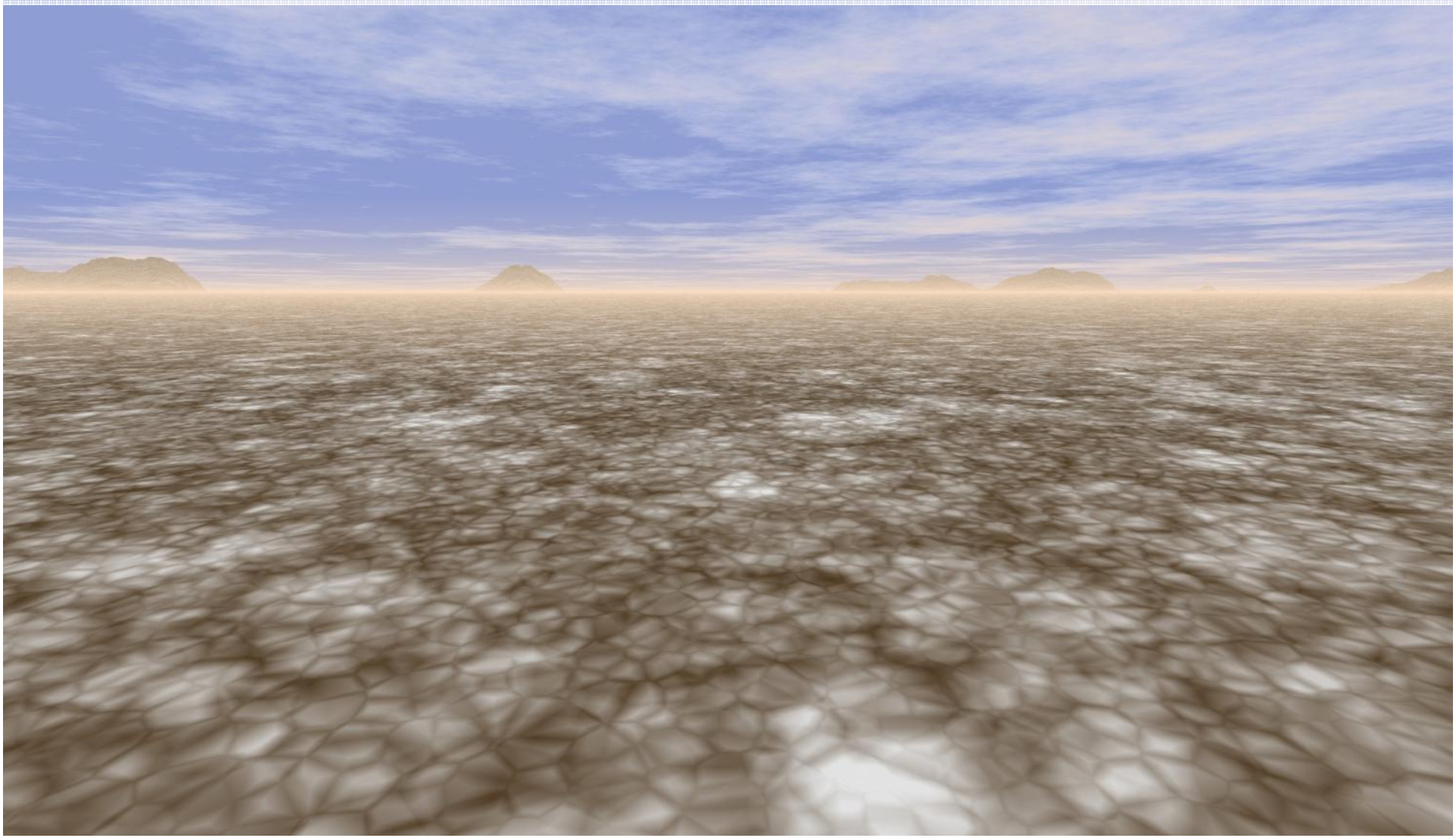
virtual forecasting office



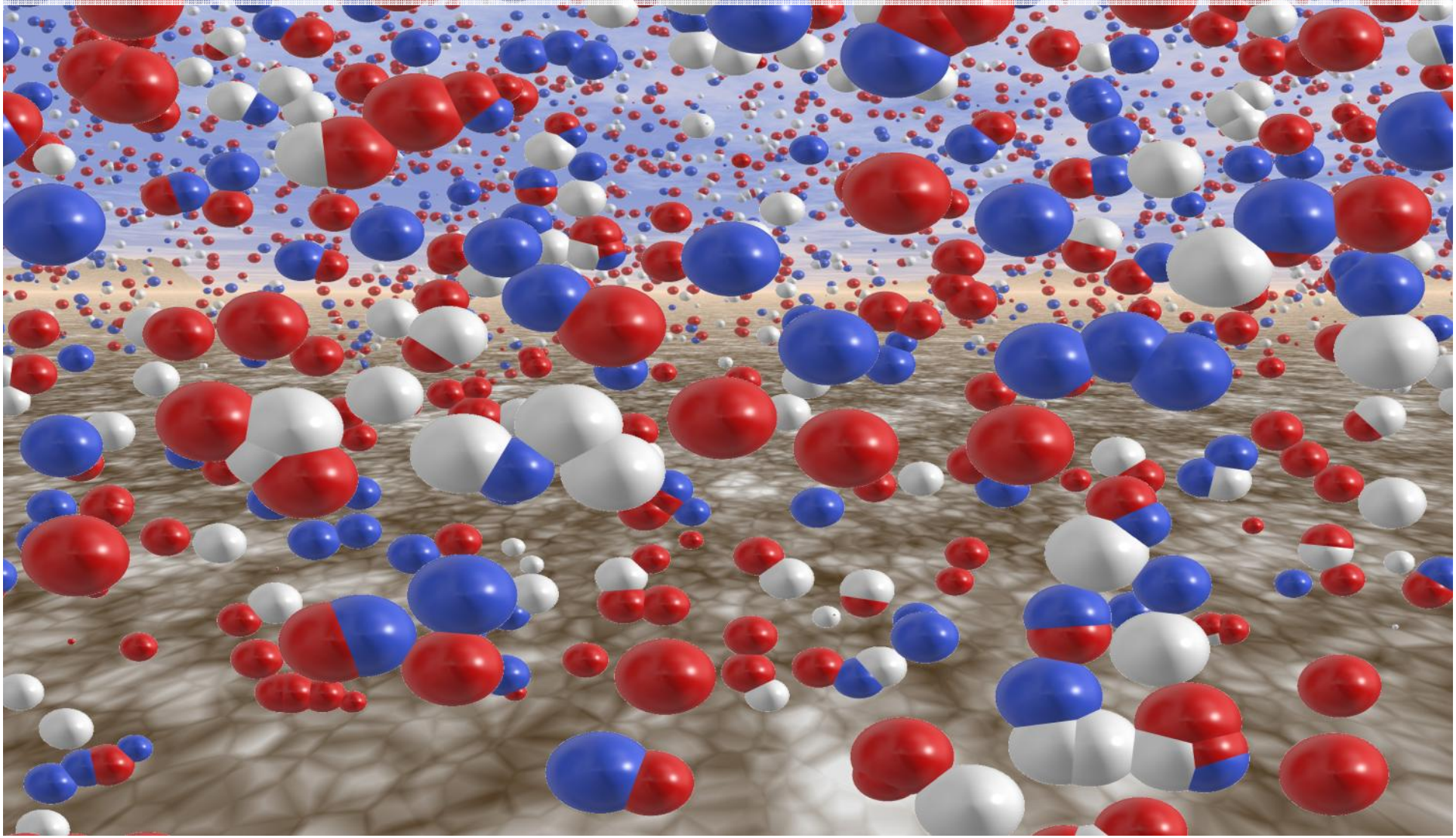

http://bit.ly/secondearth

Imagine a vast virtual work area….

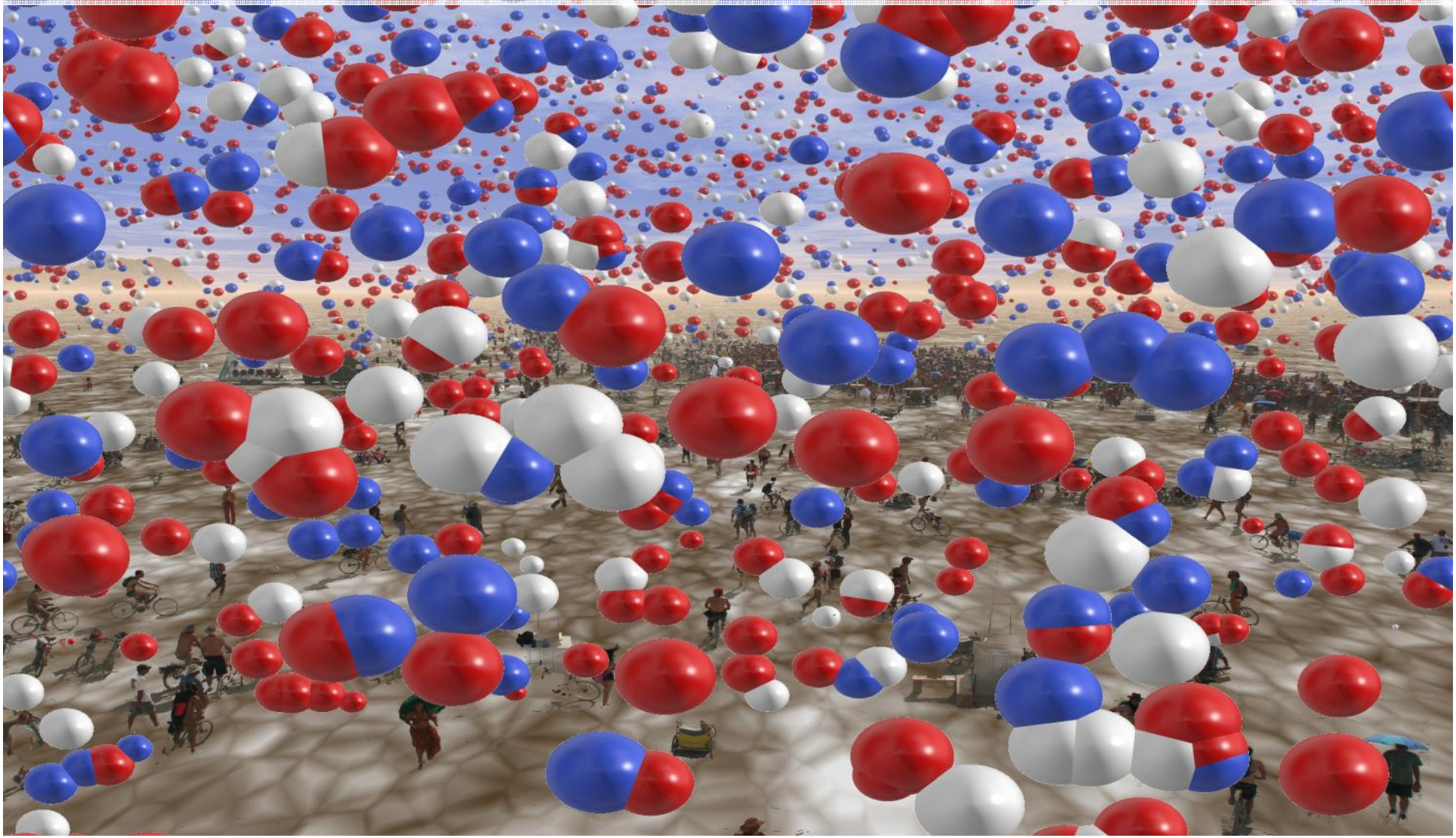
http://im-tel.org/

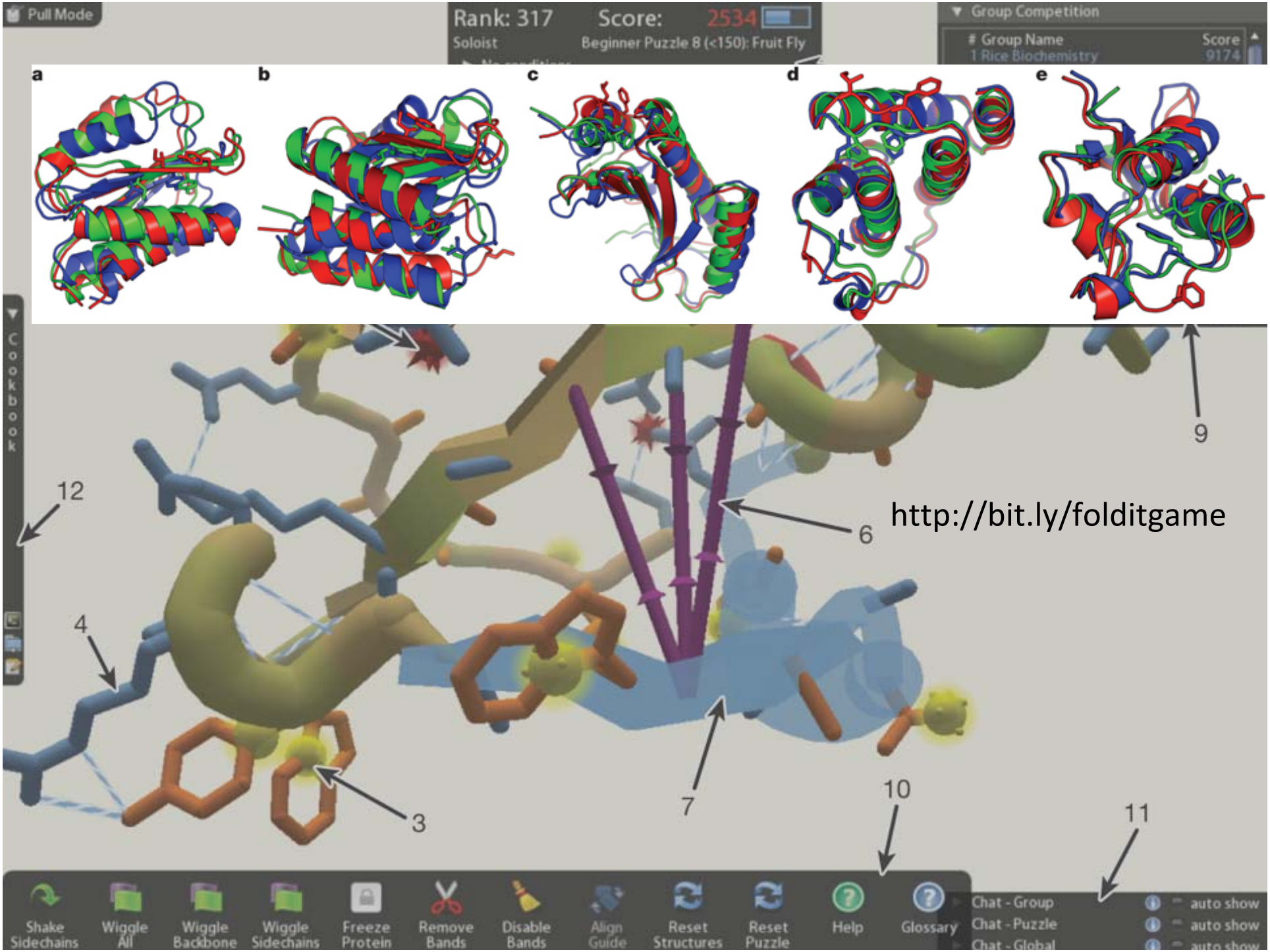


Populated with millions of data objects…



Analyzed by thousands of people…




Pull Mode
Rank: 317
Score: 2534
Soloist
Beginner Puzzle 8 (<150): Fruit Fly
Group Competition
Group Name
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1 Rice Biochemistry
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a
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12
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10
11
http://bit.ly/folditgame
Shake Sidechains
Wiggle All
Wiggle Backbone
Wiggle Sidechains
Freeze Protein
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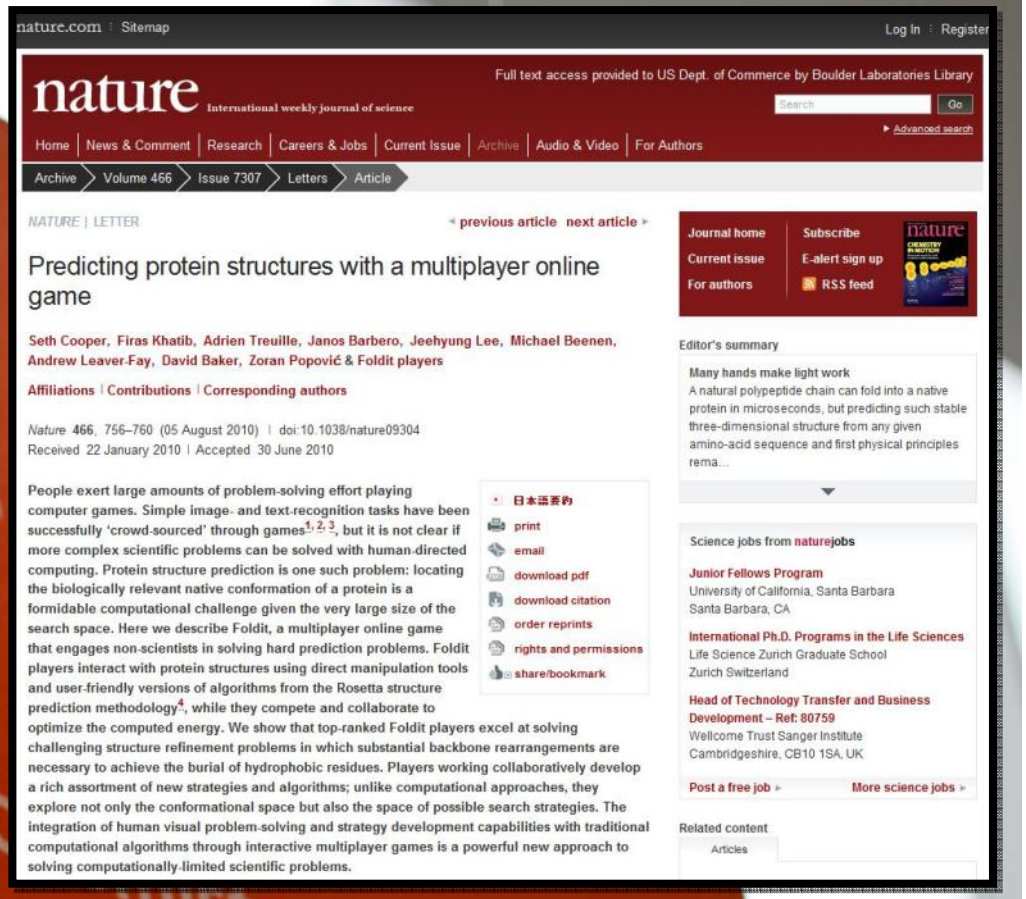

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Predicting protein structures with a multiplayer online game

Seth Cooper, Firas Khatib, Adrien Treuille, Janos Barbero, Jeehyung Lee, Michael Beenen, Andrew Leaver-Fay, David Baker, Zoran Popović & Foldit players

Affiliations | Contributions | Corresponding authors

Nature **466**, 756–760 (05 August 2010) | doi:10.1038/nature09304
Received 22 January 2010 | Accepted 30 June 2010

People exert large amounts of problem-solving effort playing computer games. Simple image- and text-recognition tasks have been successfully 'crowd-sourced' through games[1,2,3], but it is not clear if more complex scientific problems can be solved with human-directed computing. Protein structure prediction is one such problem: locating the biologically relevant native conformation of a protein is a formidable computational challenge given the very large size of the search space. Here we describe Foldit, a multiplayer online game that engages non-scientists in solving hard prediction problems. Foldit players interact with protein structures using direct manipulation tools and user-friendly versions of algorithms from the Rosetta structure prediction methodology[4], while they compete and collaborate to optimize the computed energy. We show that top-ranked Foldit players excel at solving challenging structure refinement problems in which substantial backbone rearrangements are necessary to achieve the burial of hydrophobic residues. Players working collaboratively develop a rich assortment of new strategies and algorithms; unlike computational approaches, they explore not only the conformational space but also the space of possible search strategies. The integration of human visual problem-solving and strategy development capabilities with traditional computational algorithms through interactive multiplayer games is a powerful new approach to solving computationally-limited scientific problems.

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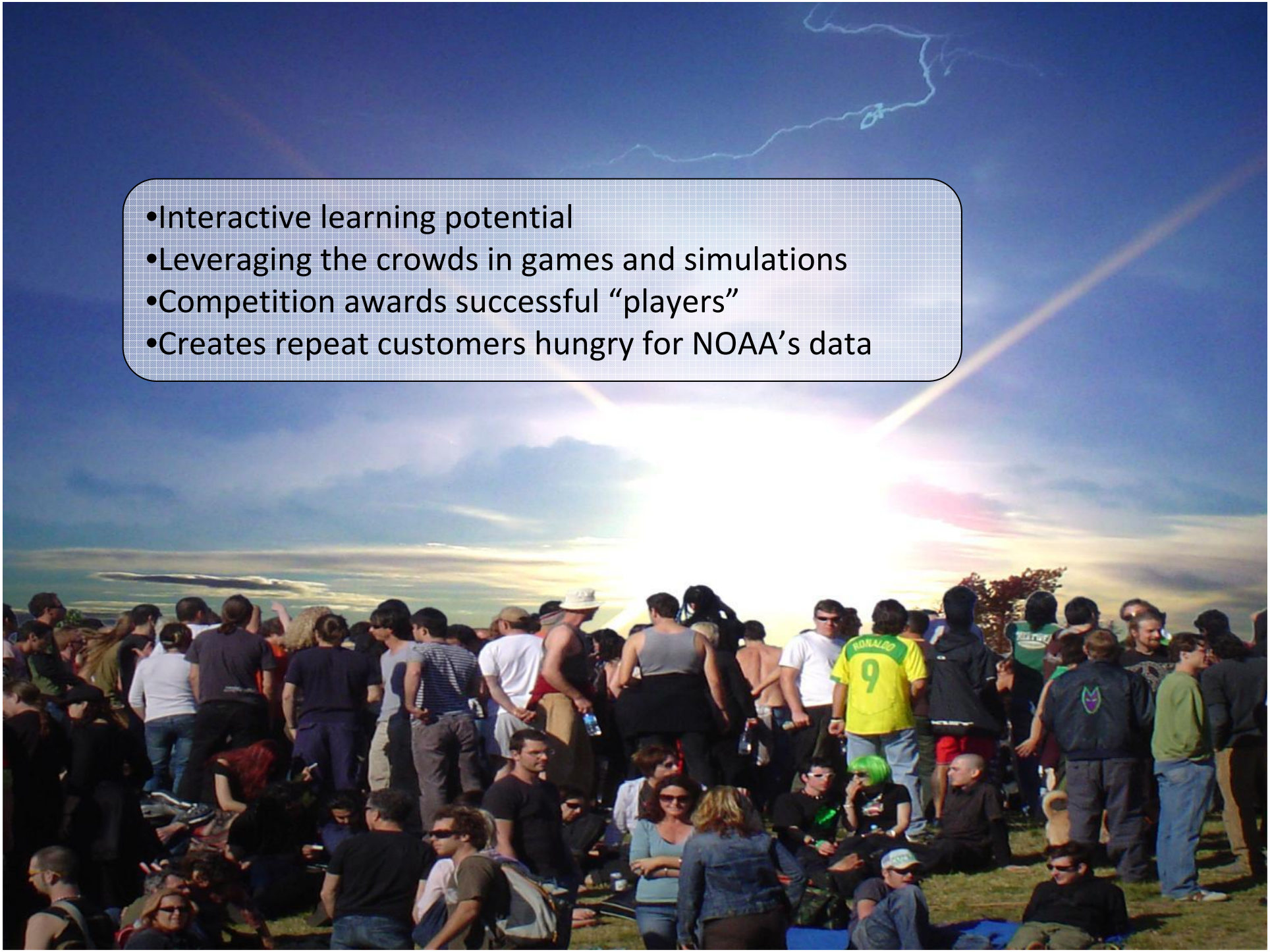
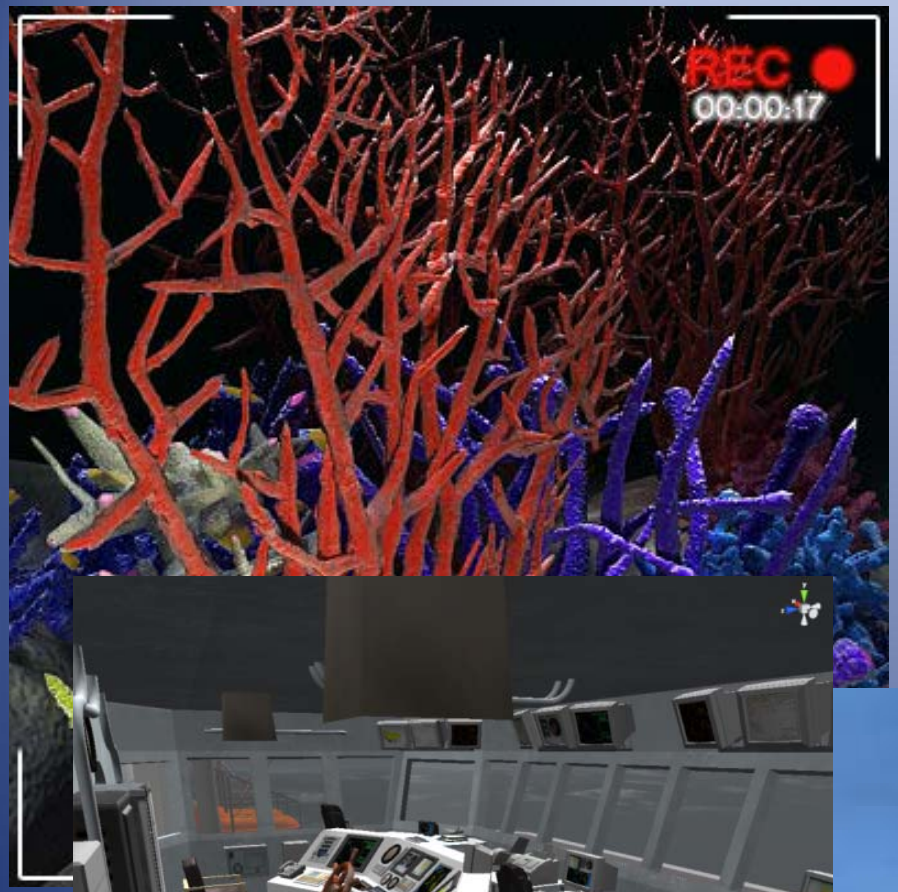
http://www.nature.com/nature/journal/v466/n7307/full/nature09304.html



- Interactive learning potential
- Leveraging the crowds in games and simulations
- Competition awards successful “players”
- Creates repeat customers hungry for NOAA’s data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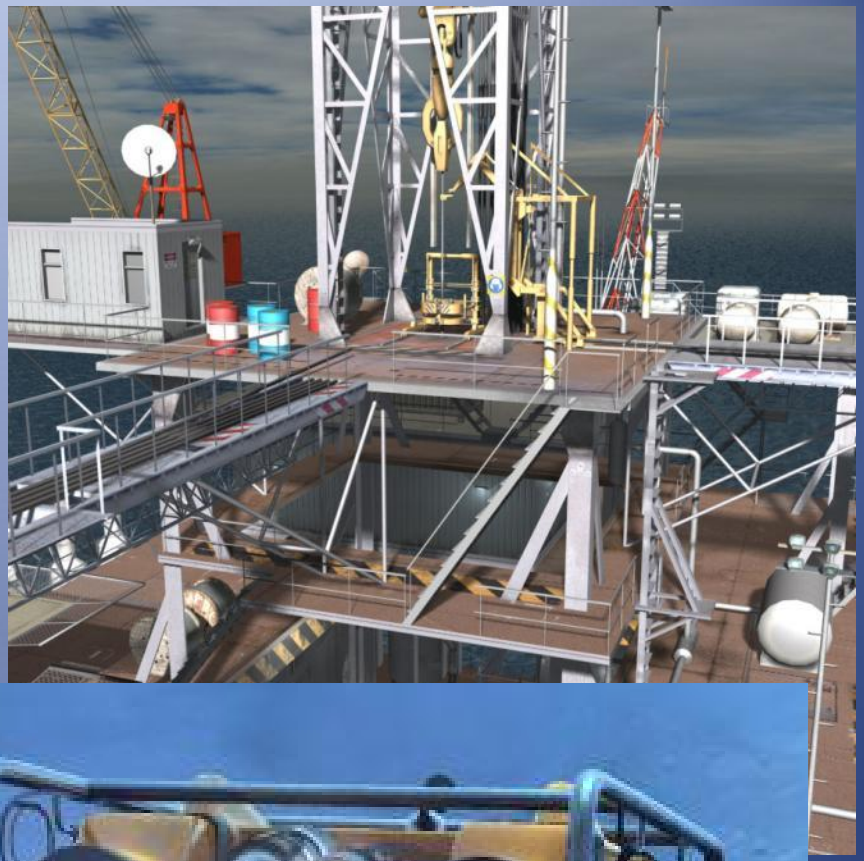

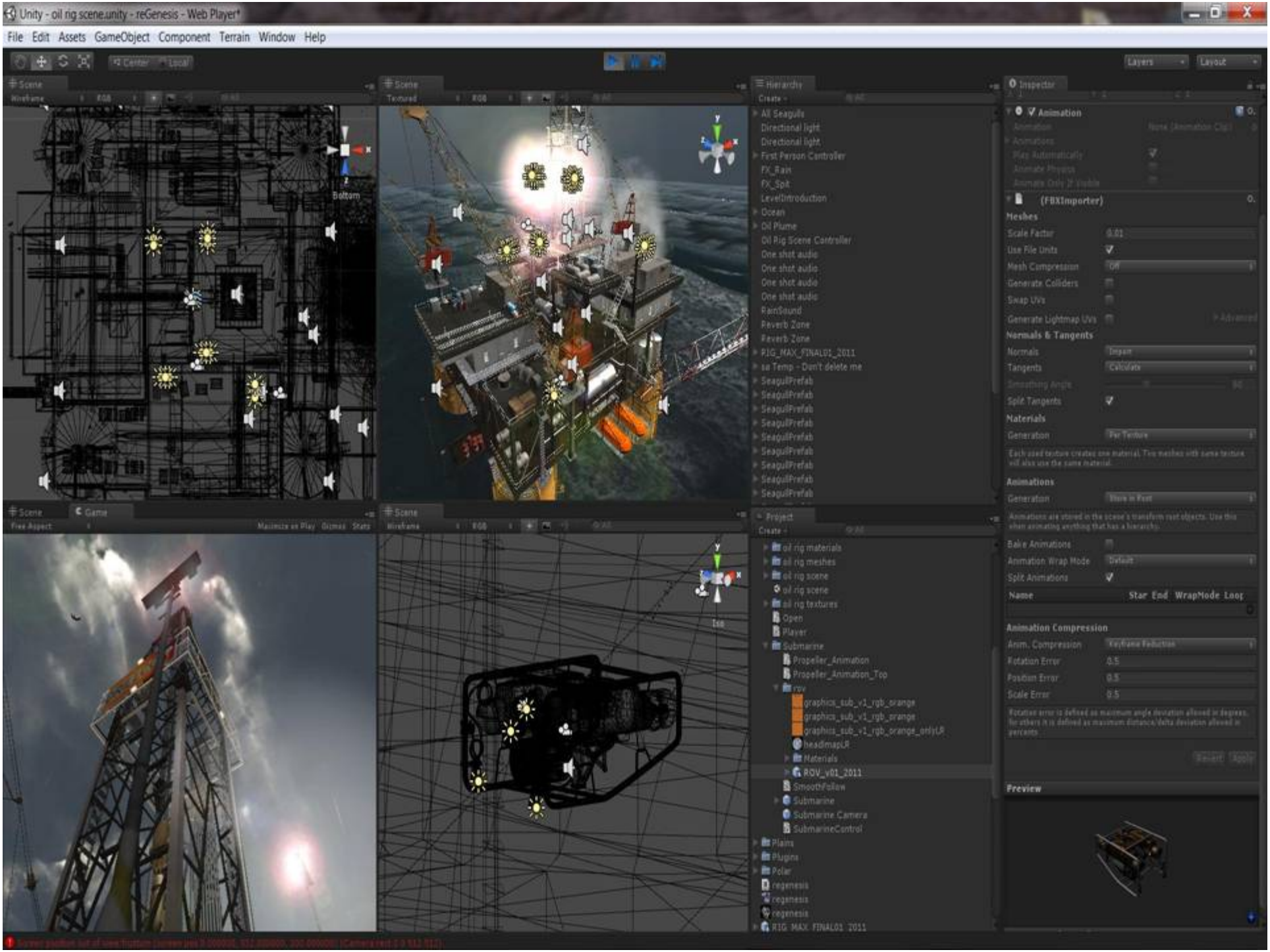
Unity - oil rig scene.unity - reGenesis - Web Player*
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Scene
Hierarchy
Inspector
Project
Game
Animation
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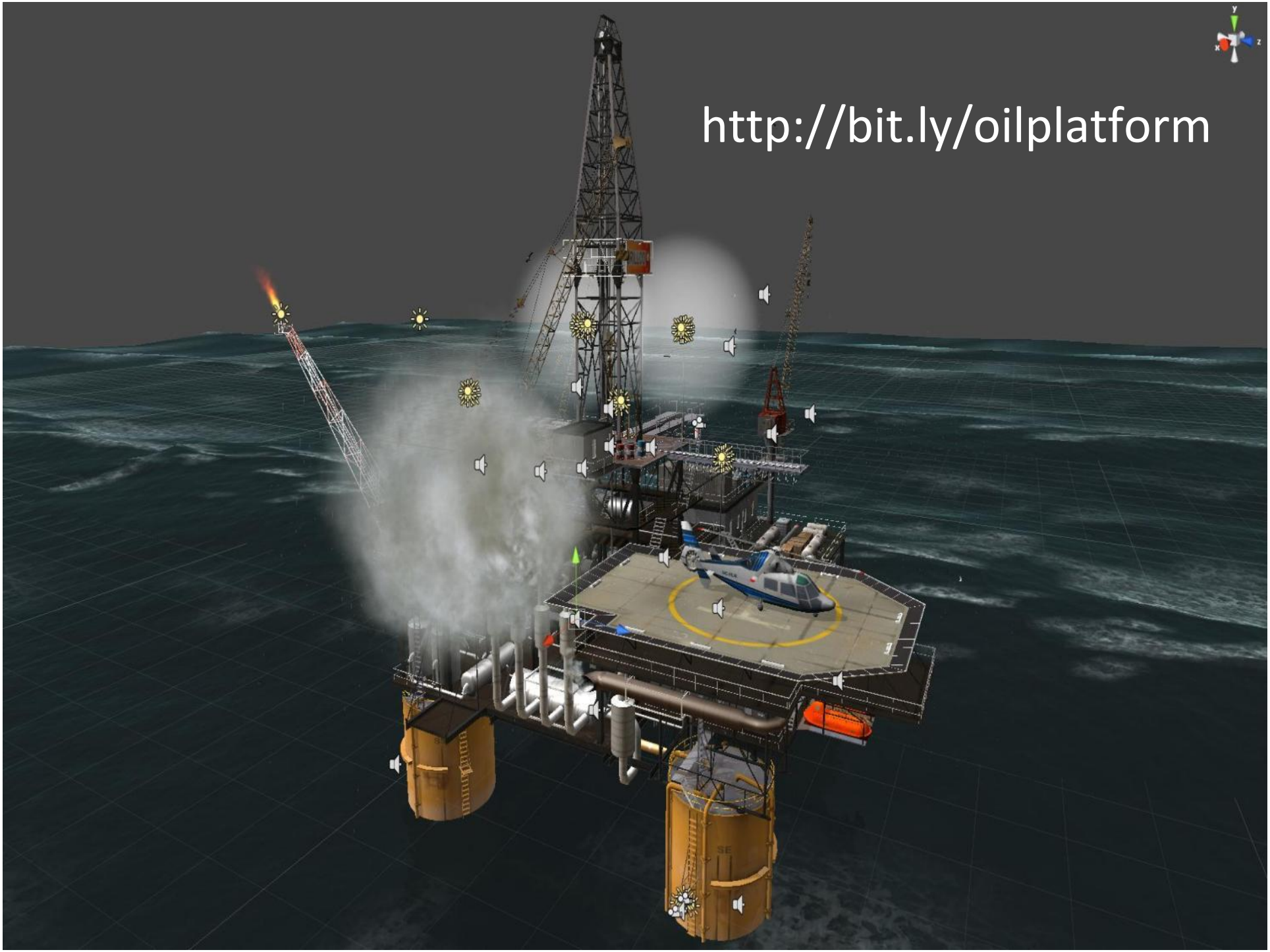
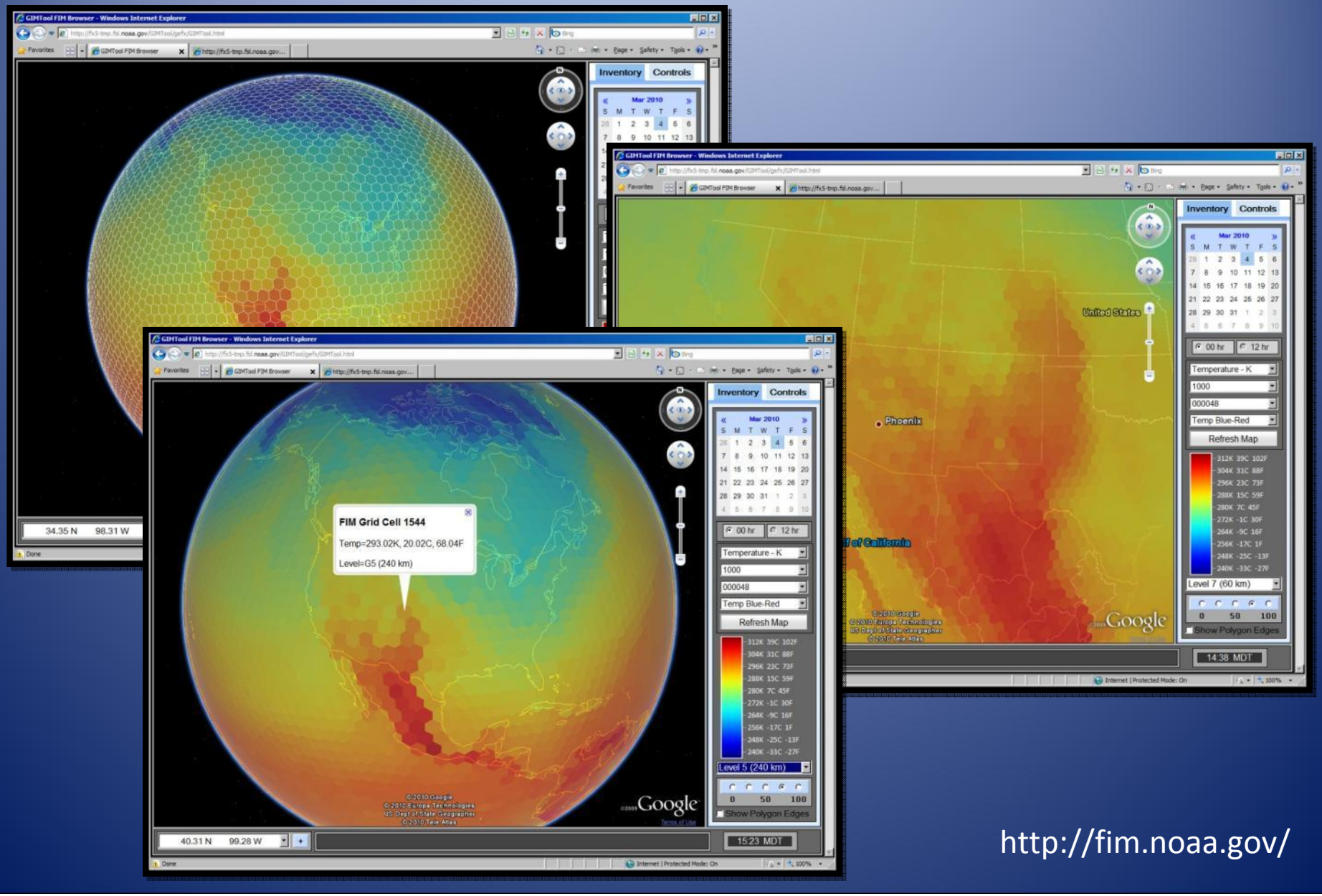
Meshes
Materials
Animations
Preview

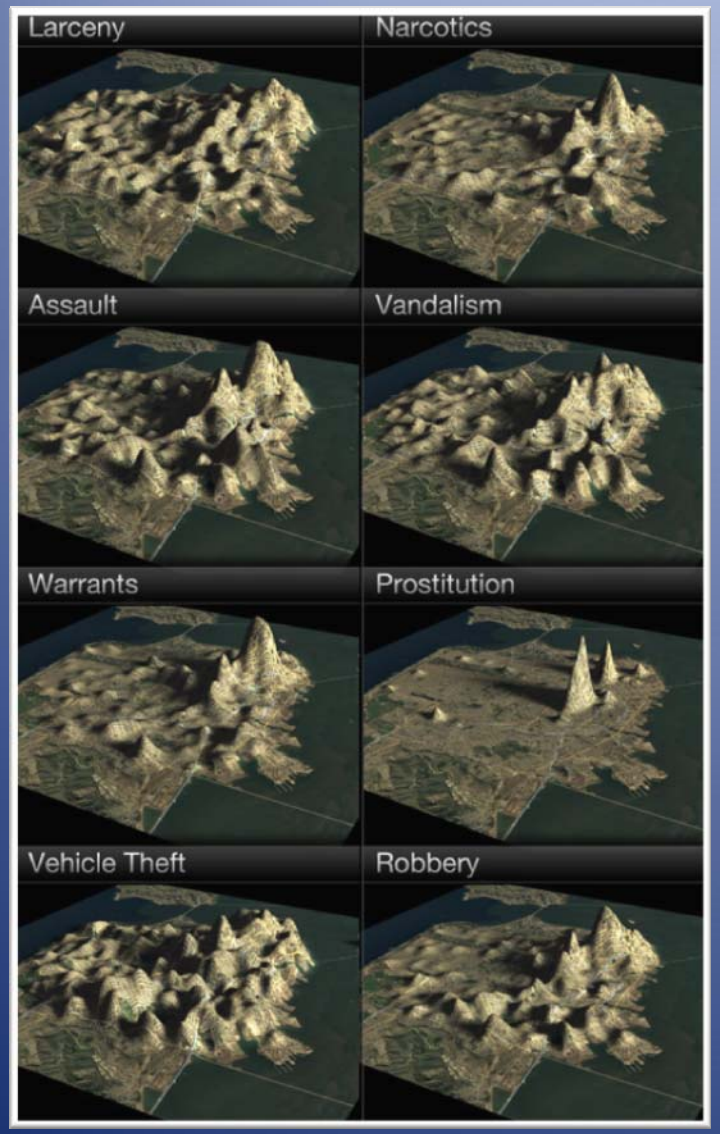

http://bit.ly/oilplatform

cloud-based visualizations of large data sets



http://fim.noaa.gov/

data viz examples



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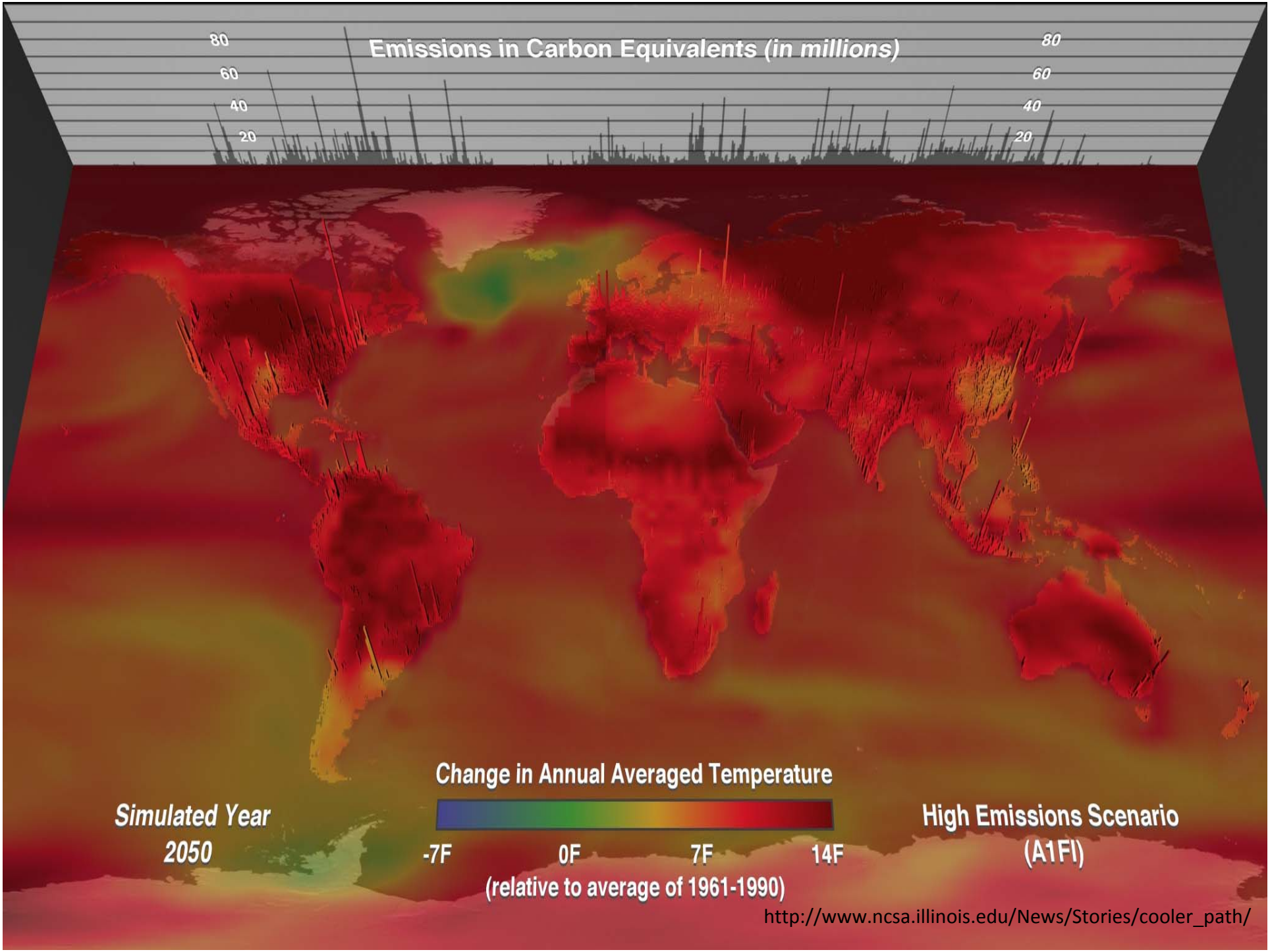

http://www.ncsa.illinois.edu/News/Stories/cooler_path/

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An Executive Guide for Keeping Up with Virtual Worlds

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- Attend the Federal Consortium for Virtual Worlds: http://www.ndu.edu/iCollege/fcvw/index.htm
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Questions?

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