

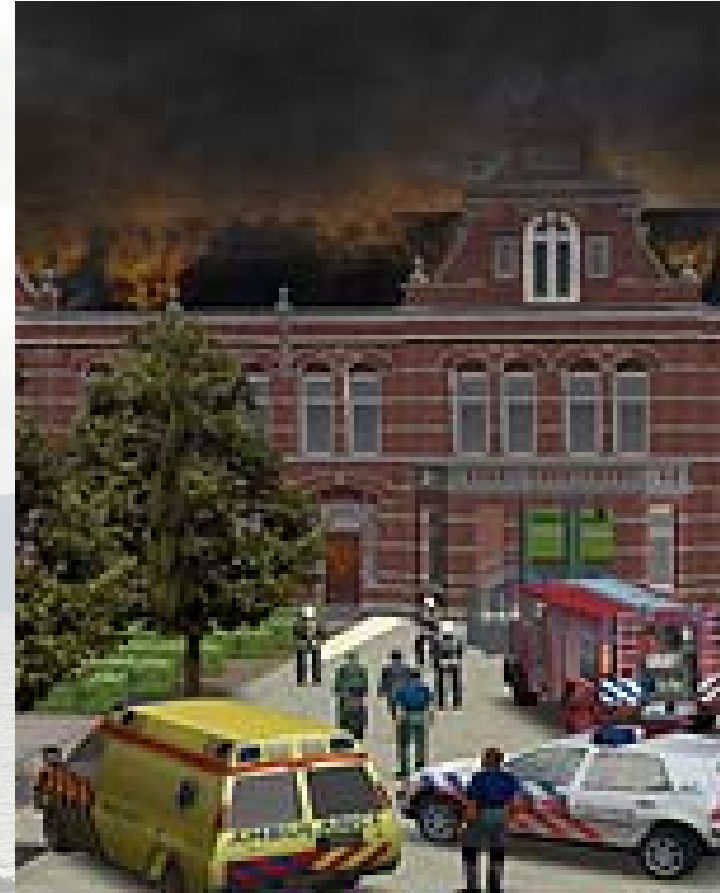
Simulating Marine Environments - Virtual Galway Bay

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Topics to be covered

- From Maps to Simulation Technology
- The benefits of a Smart 'Virtual' Bay
- An overview of the Mycosm and GeoVisionary platforms
- GeoVisionary demo of Virtual Galway Bay

From Maps to Simulation Technology



From Measuring our environment to Simulating the Processes that occur within it

Why Simulate?

- Enables you to test conditions / processes which are difficult or not cost effective to do so in the real world environment, e.g. flight simulators, fire and rescue.

Could a deep water oil rig simulator have either prevented or helped hasten the capping of the BP burst oil well in the Gulf of Mexico?

- Simulation leads to better decisions and fewer costly mistakes in real world situations.
- Simulations enable the simple communication of sometimes complex scenarios.

In a marine context, simulations can serve the challenges of;

- Inaccessibility – Virtual Dives
- Difficult testing conditions for new technology e.g. wave energy
- Improved communication

Let it not be said in 10 years time that we still know more about the surface of the Moon than we do of the surface of our oceans

Environment assembly to simulation

Virtual Environment Assembly

- **Data** – high resolution acoustic data
- **Software** – 1st to allow us to automate the interpretation of collected data, e.g. sediment classification, geologic interpretation (potential field data)
 - to interrogate large volumes of data
- **Hardware** no longer a major issue. Greater synchronicity between hardware and software – Graphics Cards Technology

Virtual Environment Simulation

- **Software** based on gaming technology equipped with Physics Engine.

Simulation platforms tested

GEOVISIONARY

- Have assembled all available bathymetry and coastal terrain data around Galway bay on to GeoVisionary – Virtual Galway Bay
- Model contains additional 3D content assembled, such a 3D Galway city, the Marine Institute, the Celtic Explorer, wind turbines. We are happy to receive additional content from parties interested in contributing to Virtual Galway Bay
- Key strengths:
 - ability to visualise massive datasets
 - integrates dynamically with ArcGIS

Simulation platforms tested



- After a long wait, we received the beta release only 2 weeks ago.
- Not all the physics utilities have been implemented yet especially with the water
- Have assembled Virtual Mutton Island. Initial testing has been positive

Quest 3D

- End product would be similar to Mycosm
- Fine for simple virtual environments but assembly gets very complicated, the more elements you add
- Not built for the assembly of spatial data

Work to be completed

- Create two more virtual environments
 - A 4 sqkm area off Aran Islands to represent sediment classification. Create pseudo orthos of the seabed
 - A 16th century environment – Drogheda Port and simulate the sinking of a Viking Ship
- Would like to simulate wave turbine technology in Virtual Galway Bay

Any other suggestions are most welcome

Demos

MYCOSM[®]

Movie of real-time movie around **Mutton Island**

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Real-time demo of **Virtual Galway Bay**
by Andy O'Keefe

 **VIRTALIS**

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VIRTALIS

GEOVISIONARY

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