Designing and Depicting Cetacean Interactions and Ecosystems

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Preliminary remarks

- I use **Voice chat**.
- I don’t speak English natively.
- Please use **Text Chat** when you give me a question or comment.
- Please use **SL Viewer v.3** or its equivalent, for **Shared Media** (Web on an Prim).

Outline of my presentation

1. Self Introductions
2. Challenges in visualization of Content and Contexts

2.1 Visualization of Content

2.2 Visualization of Ecosystems

2.3 Navigation and Wayfinding

2.4 New Challenges

2.5 Earth Simulation Animation on a Sphere

3. How to collaborate with 3D designers?

4. To enhance science 3D content / contexts in SL for Education

1. Self Introductions

- Hajime Nishimura (Yan Lauria in SL)
- Abyss history
- Kenneth Y T Lim (Veritas Raymaker)

Hajime Nishimura (Yan Lauria in SL)

SL: Curator of Abyss Observatory

RL: Coordinator for Earth Observation Data Integration

Data Research Center for Marine-Earth Sciences (DrC)

Japan Agency for Marine-Earth Science and Technology (JAMSTEC)

Science Fiction collector of Marine, Earth, Ecosystem themes

Organizer of Underwater Vehicle Competition for students

7 years history of Abyss Observatory

Nov. 2007: **Abyss Museum of Ocean Science** by Rezago Kokorin and Sunn Thunders at **Gun** (1/3 region)

Mar. 2009: Closed.

Jan. 2010: **Abyss Observatory** (**Abyss at SE3**) by Japanese volunteers with Rezago at **Second Earth 3** supported by **NOAA** (1/3 region)

Mar. 2011: Closed due to budget cut of NOAA

Apr. 2011: **Abyss at SE3** was restarted supported by **JAMSTEC** at full region of same place, (will be closed on next March due to budget cut of JAMSTEC)

Current: **Abyss Observatory at Farwell** is under construction supported by **National Institute of Education, Singapore**

Veritas Raymaker (Kenneth Y T Lim)'s contribution to VW utilization

- **Abyss Observatory at Farwell**
  (under construction)
- **Field Studies Center at Bowness**
- **Western Front – 1917**, Frideswide
- **St Michel – the Jules Verne Museum**, Lily
- **Mathematical Art**, Da Boom - Escher's 'Relativity' and Seifert Surface
- **The Crooked House**, Galaxy Quest - the four-dimensional hypercube discribed in Robert A. Heinlein's SF novel.
- **Temasek** – learning place for the culture, history and ecology of Singapore.

2. Visualization Challenges in the Abyss at SE3 and Farwell

- Visualization of content
- Visualization of contexts

Is 3D Visualization Eloquent or Ineloquent? (1)

- 3D Visualization is very eloquent for **static Objects** if you collaborate with good **creators**.
- 3D Visualization can be eloquent for **moving objects** if you also collaborate with good **scripters**.
- 3D Visualization also can be eloquent for **Contexts**, such as **story, process, evolution, system, relation, interaction, etc.,** if you collaborate with good **curators** in addition to creators and scripters.
- But visualization of **contexts** is ineloquent when compared with **linguistic method** (text or speech)

Is 3D Visualization Eloquent or Ineloquent? (2)

- **Museum in RL** can arrange display works with detailed explanations. Visitors can **walk around** compartments

  → **overview** whole arrangement of display works in a compartment

  → **zoom into** a favorite work

  → read Artist name and title

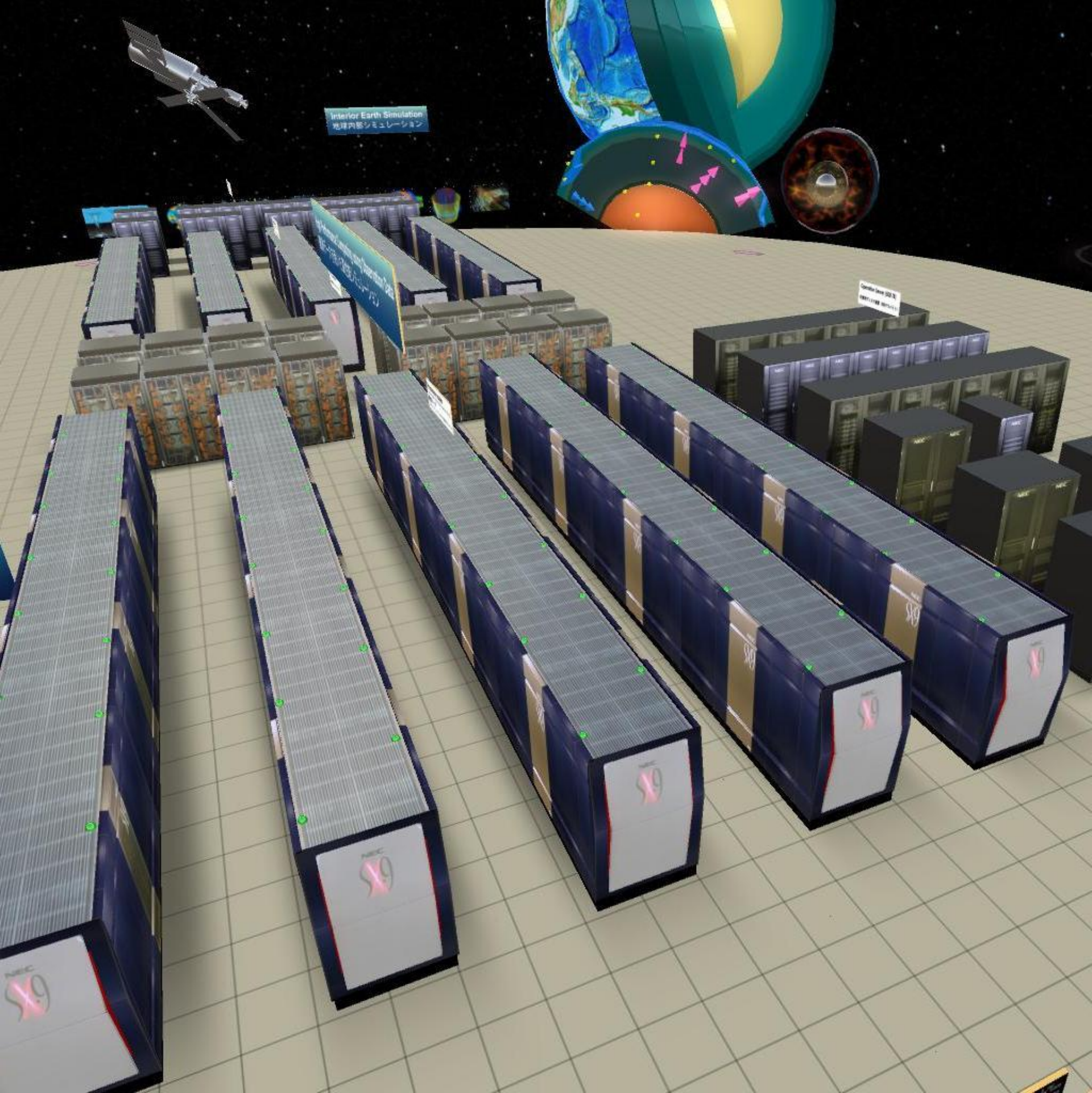
  → finally read **detailed explanation** seamlessly.

- In SL, **overview and zoom-in** is same as in RL, but visitors need to get **notecard** or jump to **web site** to obtain detailed explanation. But SL residents **don't like notecard and URL jump**.

- So, **SL exhibits are still inclined to ineloquent**.

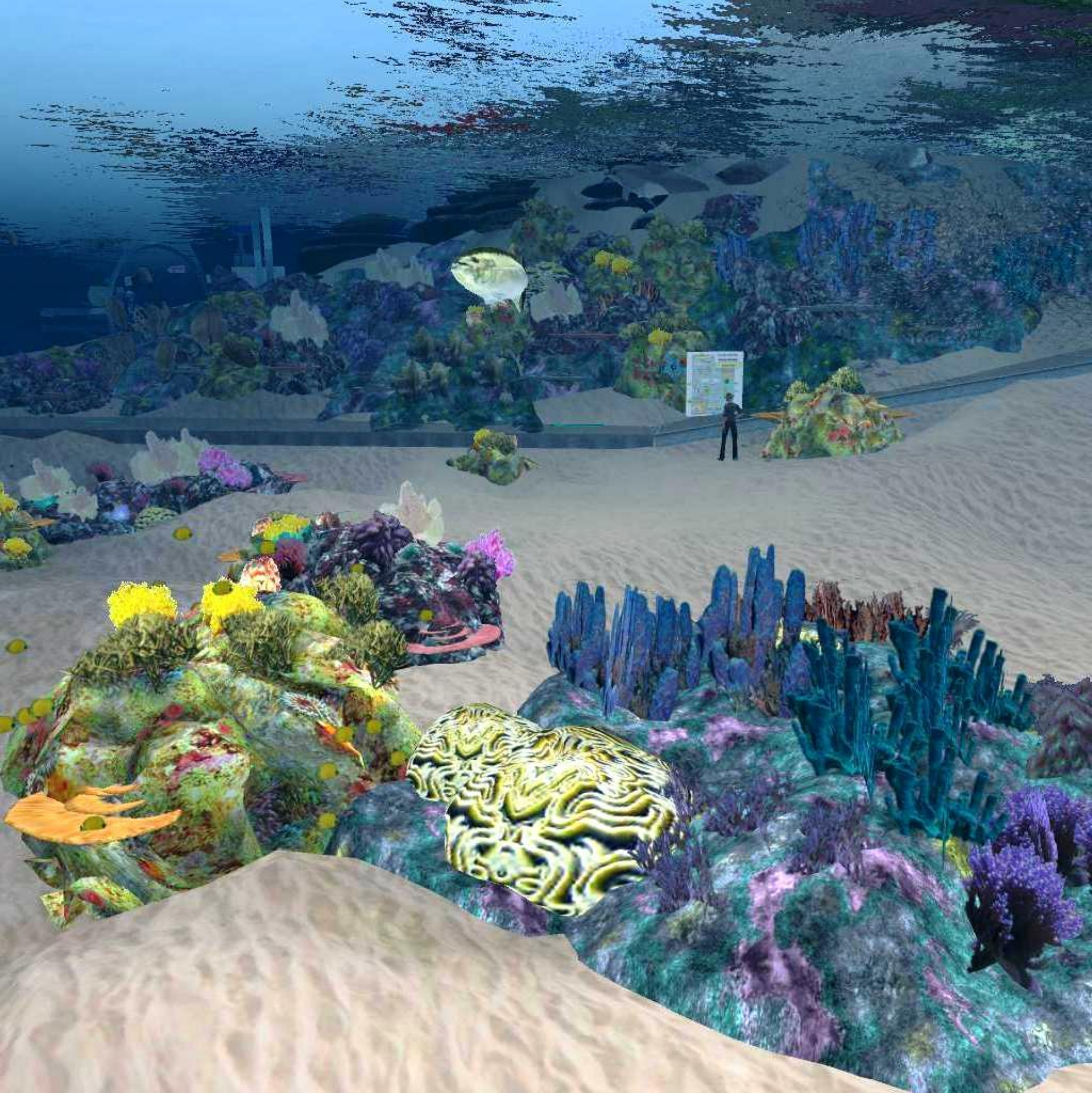
2.1 Visualization of Contents (Examples from Abyss at SE3)


OKEANOS EXPLORER


Interior Earth Simulation
地球内部シミュレーション

2.2 Visualization of Ecosystem

- Coral Reef
- Seaweed Forest
- Hydrothermal Vents



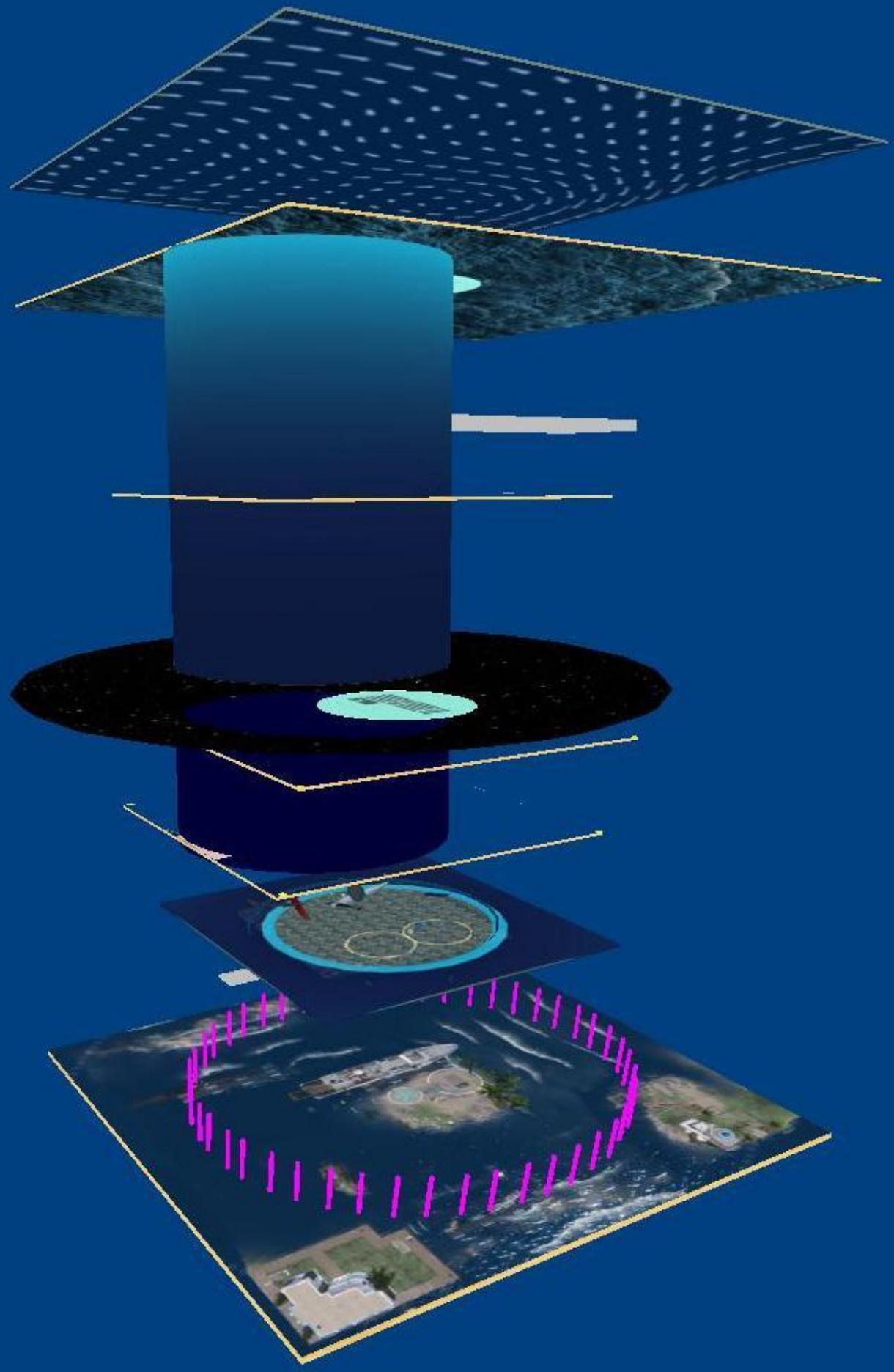
How to visualize ecosystem?

- The **visualization** of **ecosystemic** relations needs **inter-disciplinary collaboration**.
- **Multi-user online 3D environment** is ideal platform which enable to **collaborate remotely**, and **Second Life** is practically the only platform where **creators are very active**.
- On the other hand, researchers **don’t regard Second Life as a research platform yet**. So we can’t involve researchers in collaborating with regards to environments yet.

2.3 Navigation and Wayfinding (1)

Collaboration with Open University, UK

- To reduce loading time of textures and polygons within draw distance, exhibition floors of the Abyss are dispersed from ground to 4000 m sky. But this consideration induces difficulty of navigation or way-finding.
- Museum designer knows where are exhibits so he /her doesn't lost their way. So **museum designer need honest criticism by specialists**.
- I checked Abyss navigation several times by asking friends to walk around without my guidance, but those are not enough because they have no solution.

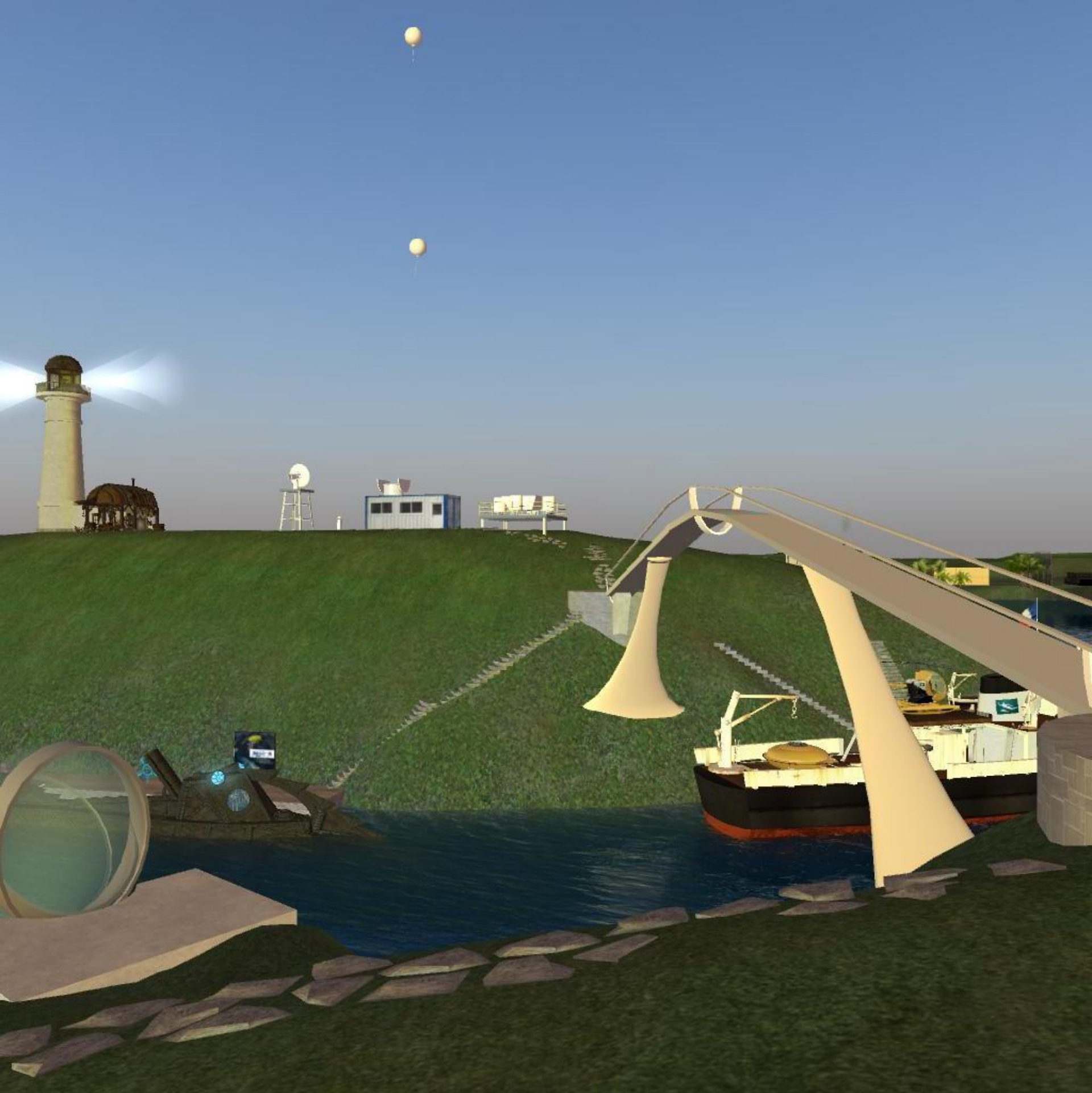


Navigation and Wayfinding (2)

Design rules by Abyss-Open Univ. collaboration:

- Divide viewing route into **four mini-tours**. We set the **central hub** as a portal to four destinations. We built a welcome house to distinguish the hub.
- In each mini-tour, set viewing route as **traversable**.
- Set enough **guide signs and arrows of theme-color** of each mini-tour: Visitors don't like note cards and URL jump. And tour ride is also difficult for vertical teleportation. So we use **classical method - Guide sign arrows**. Guide arrow on the floor is useful in 3D environment.
- Named all exhibit locations and indicate the names at the places to know where visitors arrived at.
- Set enough teleporters for "Exit to Central Hub".

2.4 New Challenges
(Examples from Abyss at Farwell)

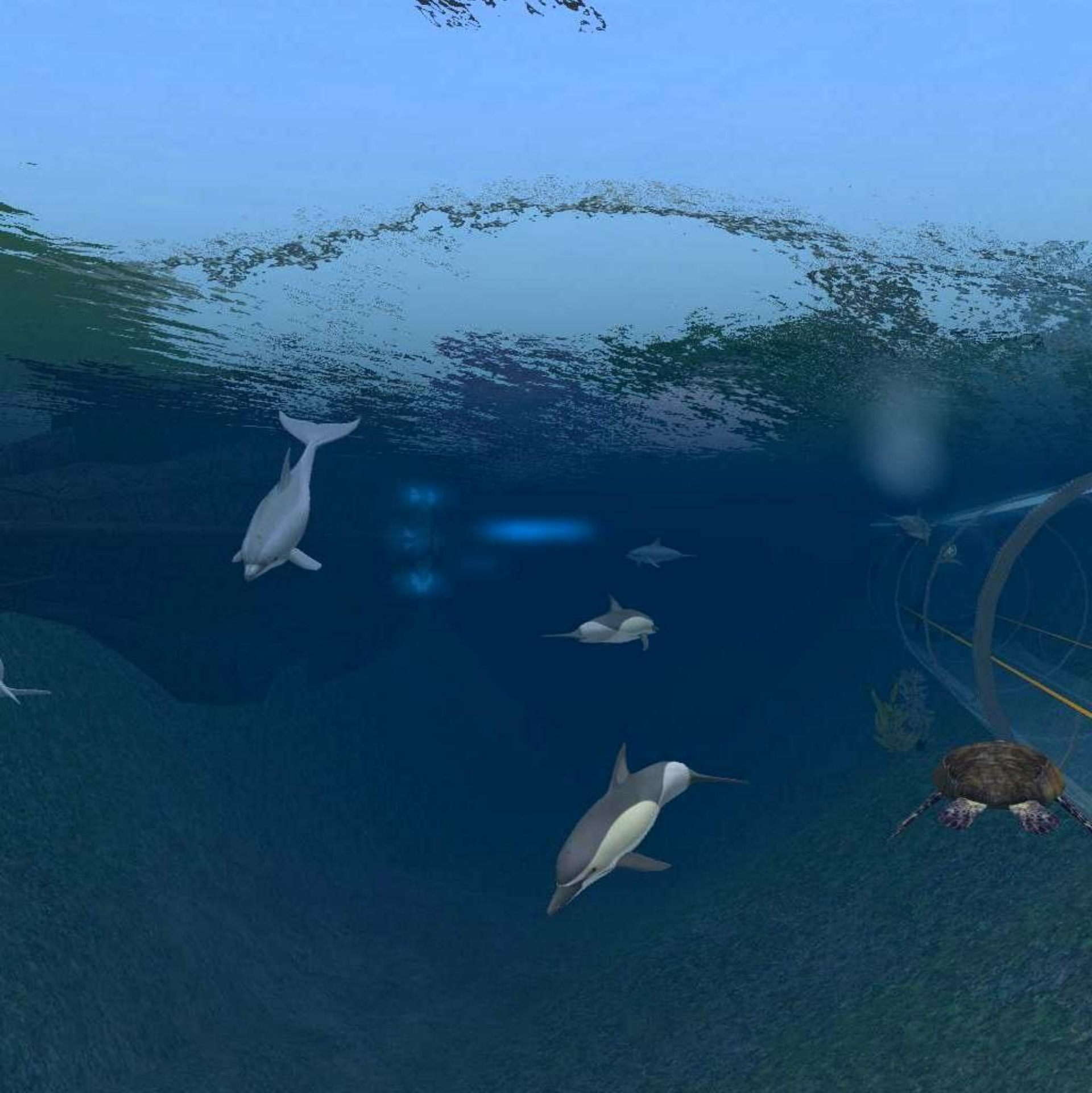



Earth Evolution

Swimming Cetacea in groups

- **Abyss at SE3** exhibits more than 50 species of marine animals but almost all of them are **single individual for one species** due to saving total scripts time.

- **Abyss at Farwell** exhibits **swimming whales, orcas and dolphins in groups** which are usual scenes in RL.



2.5 Earth Simulation Animation on a Sphere

- **GIF animation**: using **"Shared Media** (Web on a Prim)**"** function of Viewers 2 & 3.

  - **Atmosphere simulation** (NICAM): 5 days cloud motion (48 scenes)

  - **Ocean simulation** (OFES) : 1 year ocean current motion (24 scenes).

  …..need less than 100 MB, 256 colors

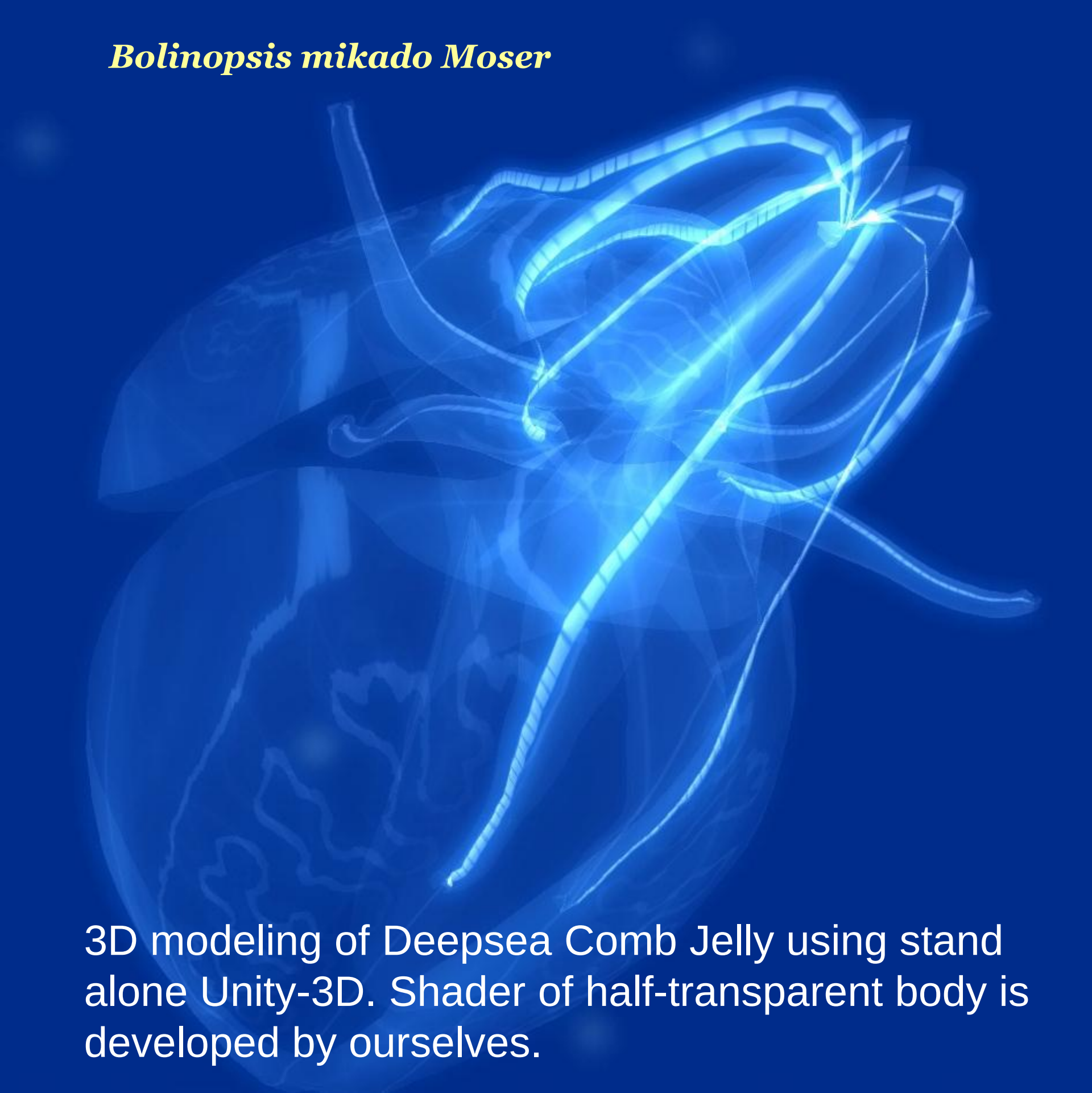
- YouTube: **Continents drift motion** for 640 million years

  …..no limitation but need to install “Google Chrome”, “Adobe flash player” and “shockwave player”.

3. How to collaborate with 3D designers?

- SL provides **intuitive 3D modeling** method for amateur creators. It is great advantage that **researchers / educators can visualize their own ideas** by themselves.
- But **high quality 3D objects** which satisfy scientific needs can be created only by **professional 3D designers**.
- Museum curators are poor due to **heavy burden of maintenance fee**, so there is a need to collaborate with **volunteer creators**. **How to keep good relations with creators** is a very essential issue.

Bolinopsis mikado Moser



3D modeling of Deepsea Comb Jelly using stand alone Unity-3D. Shader of half-transparent body is developed by ourselves.

4. To enhance science 3D contents / contexts in SL for Education

- I update Troy's "**Science related places in SL list** " to find new places, to share best practices, to provide as educational resources.
- I and Draceina Pinion provide one prim **Teleport Hub System** including more than 260 places in 16 categories as free gift.
- We convene **Monthly International Workshop on Science Exhibits in online 3D environment** (MIWoSE)

MIWoSE: Monthly International Workshop on Science Exhibits in online 3D environment

- to establish a **Science Exhibits Network** among various fields in SL with regards the provision of **educational resources**.
- to share best practices in visualization, not only of **science content**, but also **science contexts**.
- to create **new scientific value** through **interdisciplinary collaboration** using Multi-user online 3D Environments.
- to **encourage the providers of science exhibits** through communication with educators and students.

MIWoSE Schedule

15Mar: **Abyss Observatory** by Yan Lauria

20 Apr: The Open University, UK by Shailey Garfield

16 May: **The Field Studies Centre at Bowness** by Veritas Raymaker

29 Jun: **Center for Water Studies** by Delia Lake

6 Jul: **Exploratorium** by Patio Plasma

3 Aug: **The SploLand** by Patio Plasma

Sep: **STEM Island** by Vic Michalak

12 Oct: **Genome Island** by Max Chatnoir

To be continued…….

Workshop starts at **7 am PDT on Saturday** so that West coast of USA～Europe～India～East Asia～Australian people can participate.

Thank you!