Creative Informatics for the Earth

Chair

Hitoshi Matsuoka
Principal Investigator, Miraikan

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Speakers

Hitoshi Matsuoka

Principal Investigator, Miraikan

Daisuke Matsuoka

Scientist

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

Synichi Yamamoto

Artist/Creative Director, Omnibus Japan

Gopal Shah

Product Manager, Google Earth, Google

Miraikan

Hitoshi Matsuoka

Principal Investigator
(Science Communication)
Miraikan

Hitoshi Matsuoka is in charge of collecting scientific data, developing visualization methods for effective communication and creating strong partnerships with research institutions in Japan and abroad. He will present an overview on how are scientific data used for communicating science in Miraikan.

Geo-Cosmos

Luminescence device

Organic LED

10,362 panels (96 mm x 96 mm)

Number of pixels

Over 10m. pixels

Question

What should we communicate to visitors?

Feel a sense of crisis and ponder one’s role in facing global challenges

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What should we communicate? (1)

The facts presented and proven scientifically

Ex. The sheer amount of endangered and extinct species

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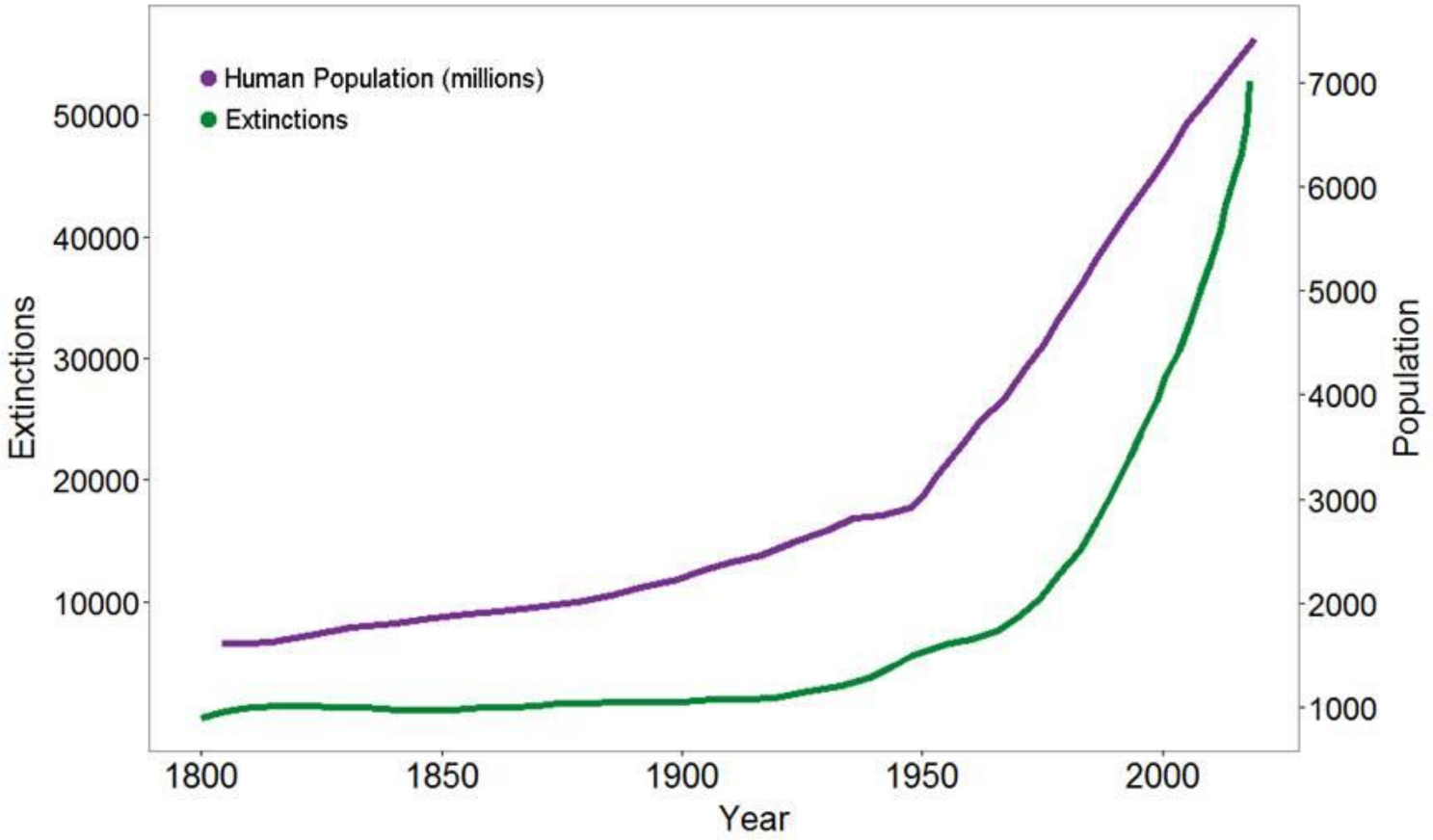
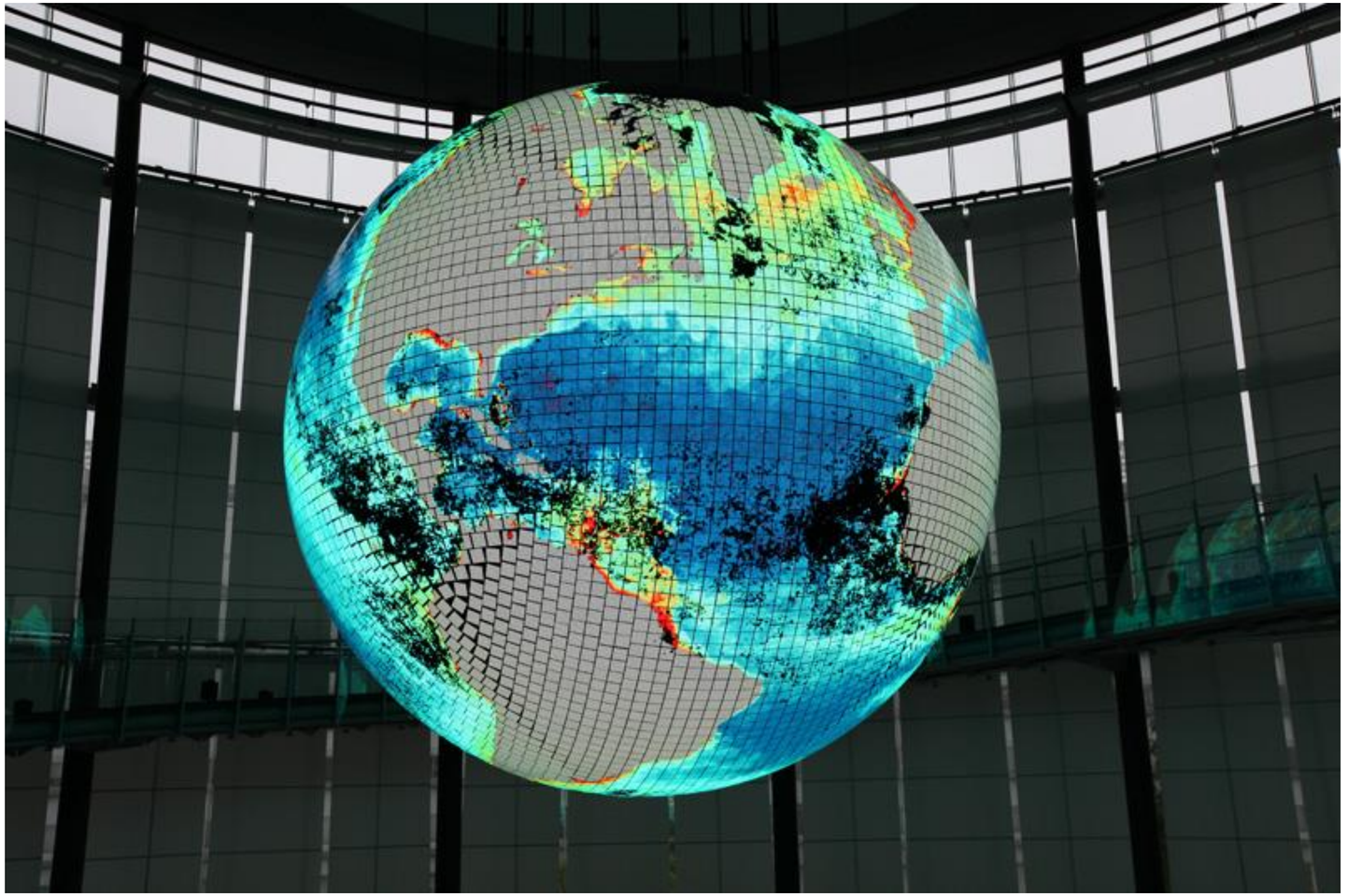
Humans & The Extinction Crisis



Data source: Scott, J.M. 2008. *Threats to Biological Diversity: Global, Continental, Local*. U.S. Geological Survey, Idaho Cooperative Fish and Wildlife, Research Unit, University Of Idaho.

Ocean Vegetation

Abundant phytoplankton in the polar regions



Migratory Routes of “Arctic Tern”

35,000km migration from Arctic to Antarctica

- Solar Energy
- Organic plant matter
- Blooming phytoplankton
- Small fish preying on phytoplankton

What should we communicate? (2)

The effects of human activities

Ex. Exponential population shift from rural to urban areas

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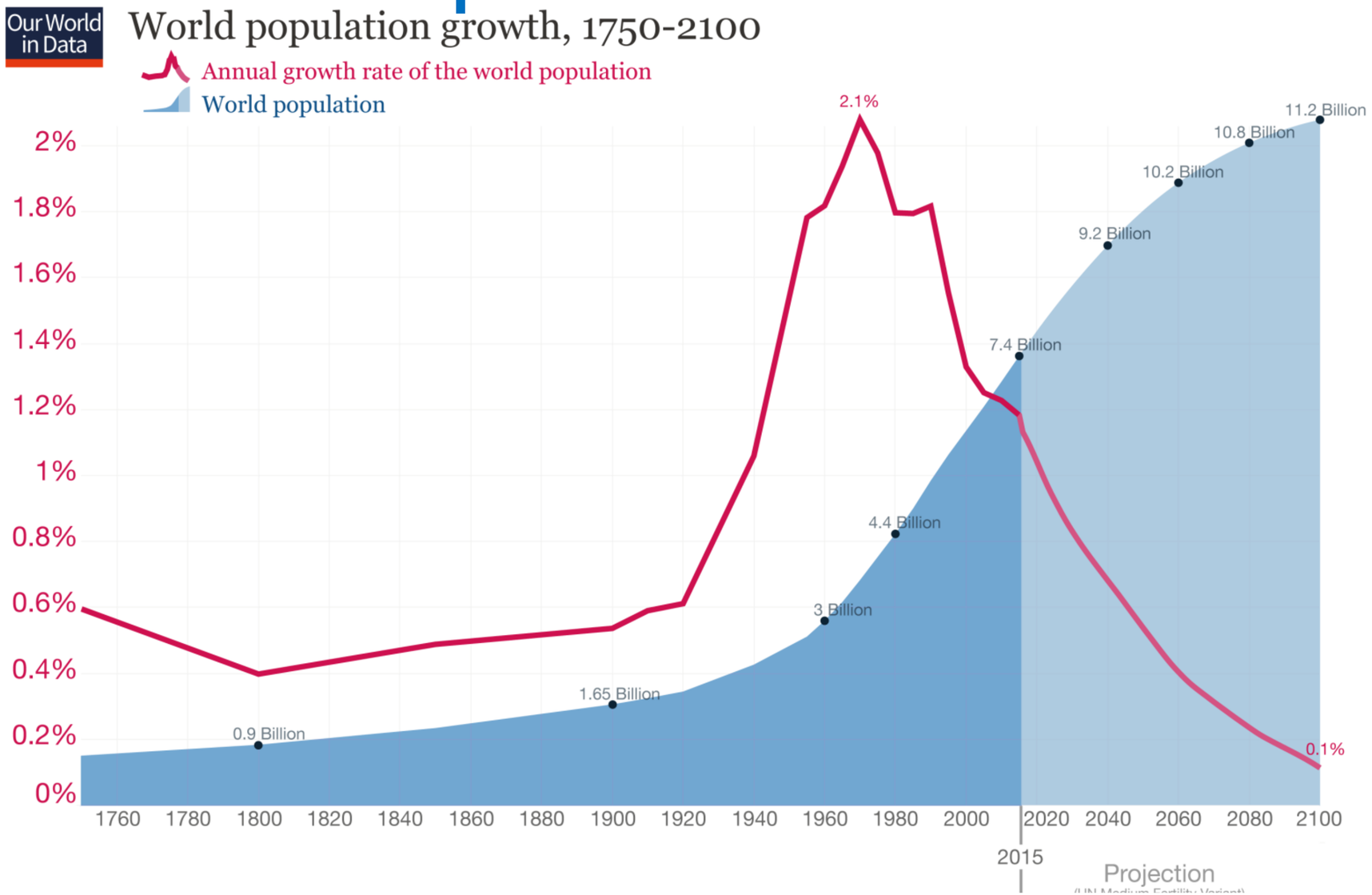
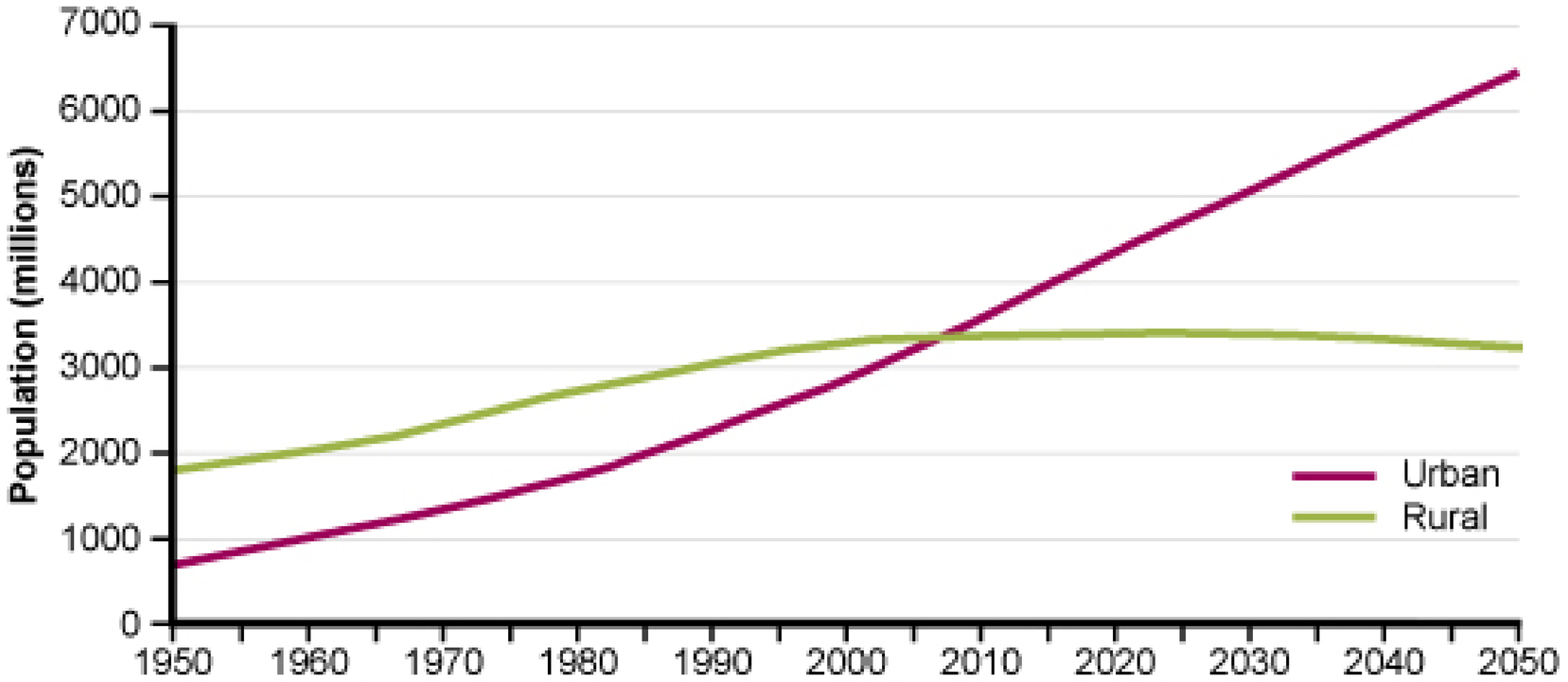
Population Shift



Max Roser and Esteban Ortiz-Ospina (2017) – 'World Population Growth'. Published online at OurWorldInData.org. Retrieved from: https://ourworldindata.org/world-population-growth/ [Online Resource]

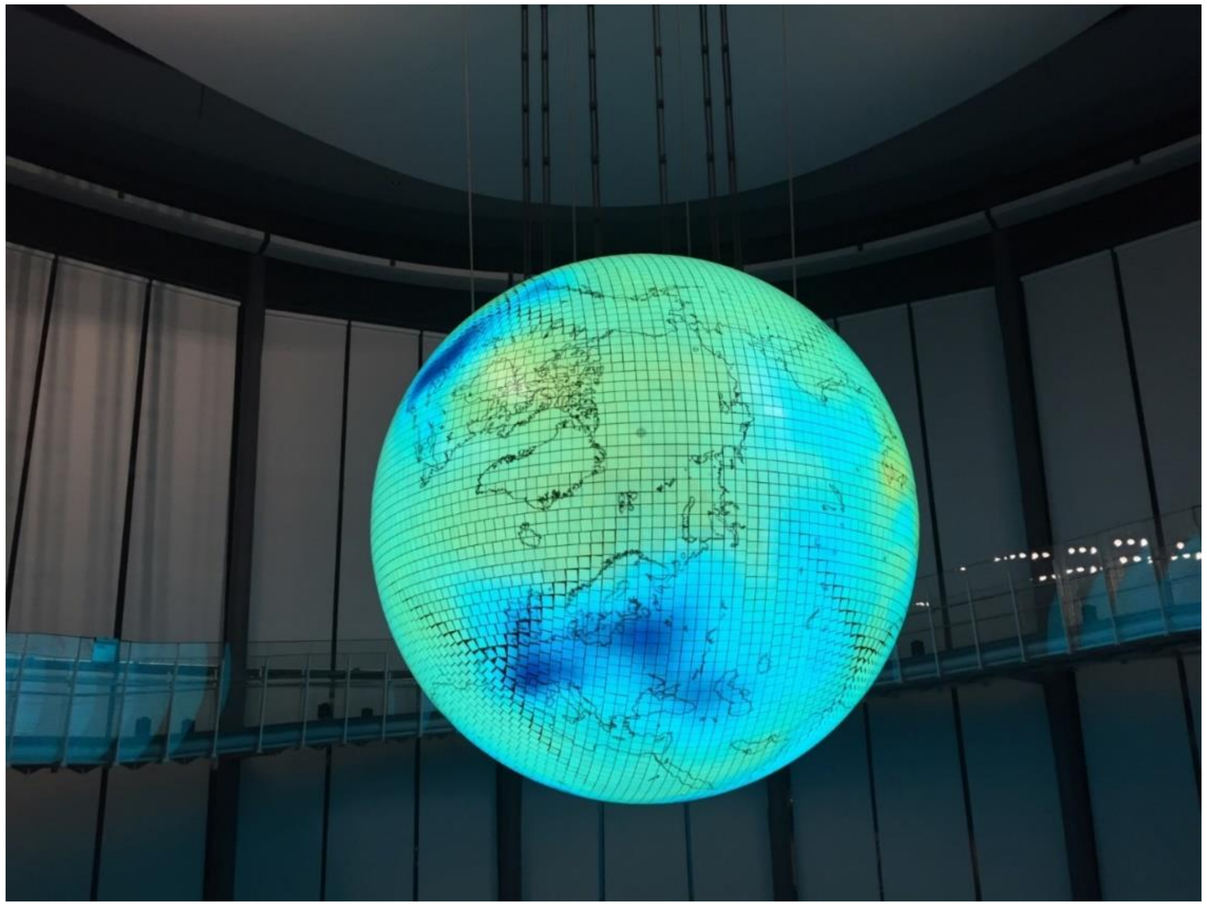
Urbanization

Total estimated to reach 10 billion by 2050
70% of the population will reside in urban areas by 2050



Data from: DESA, U. (2014). World urbanization prospects: The 2014 revision, highlights (ST/ESA/SER. A/352). Department of Economic and Social Affairs. *Population Division, New York: United Nations*.

“IBUKI” Observation



Monitoring the density of greenhouse gases

More specifically, the worldwide allocation of greenhouse gases

What should we communicate? (3)

How climate change will affect the future

Ex. Predictions from the Intergovernmental Panel on Climate Change (IPCC)

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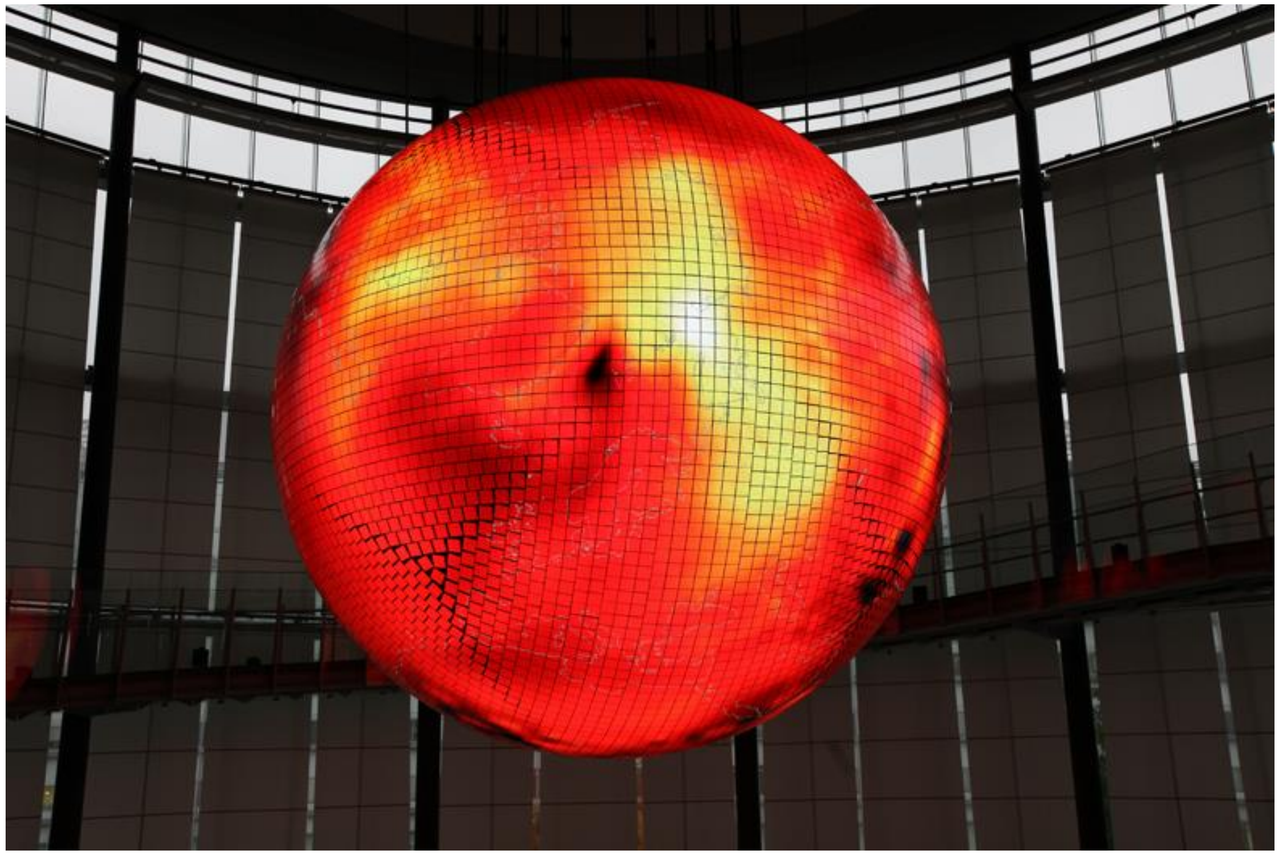
Future Projection – Air Temperature

Temperature difference of the average from 1971 to 2000



We posed the question...

How do we communicate with visitors?

We hope to answer that question with our exhibit

“Discover your Earth”

Geo-Cosmos, Geo-Scope, Geo-Prism

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How do we communicate? (1)

Question

How to gain new perspectives of the Earth?

Geo-Scope

An interactive board making it easy to find and observe global-scale data

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Geo-Scope

Interactive board 13 tabletops with touch-panel displays

How do we communicate? (2)

How can we gain new perspectives of the Earth?

Through Geo-Prism

A System using AR technology to display data and simulations overlaid on Geo-Cosmos

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Geo-Prism

Touchscreen terminals using AR technology around Geo-Cosmos

Conclusion

We hope through Miraikan you will be able to…

- Understand facts presented by science
- Think about the converse effects on the environment due to human activity
- Realize how much climate change will affect our future

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Thank you for your attention!

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