

Speech at Digital Twins of the Ocean Summit, Xiamen, China, 10 November 2023, by UNSG's Special Envoy for the Ocean, Ambassador Peter Thomson

Xiamen University President Zhang Rong,
Excellencies,
Ladies and Gentlemen

All courtesies observed and respectful greetings to all present. My thanks go to the organisers for giving me this opportunity to address you all.

Ladies and Gentlemen,

As I said in my address to the International Digital Twins of the Ocean Summit in London last year, it is deplorable that we are still on a direct path to three degrees global warming before the end of this century. If we love our grandchildren, this is not a path upon which we can continue in good conscience. For our little ones, it is a path towards a life of plagues, fires, famines, rising sea levels and tropical storms of increasing frequency and ferocity.

In 2022 when he launched the latest IPCC 2022 Report, UN Secretary-General Antonio Guterres said, "We are firmly on track towards an *unliveable* world." He said, "This is not fiction or exaggeration. It is what science tells us will result from our current energy policies." This is not a message we can ignore, not one we can resile from for reasons of selfish lassitude, greed or a sense of hopelessness.

When I hold my granddaughters in my arms, acceptance of the science becomes almost unbearable. That is why the main thrust of my messaging as Special Envoy is intergenerational justice and a call to meaningful action to avoid the worst. Acting now, means transforming our ways: our energy supplies, modes of transport and food systems, transforming them into truly nature-friendly circular economies.

We must set course to a shared ecological civilization, or as we have been discussing in Xiamen this week, to a marine ecological civilization.

Ladies and Gentlemen,

As we grapple with powerful forces in our quest to make up the shortfalls in the implementation of the Paris Climate Agreement and the UN's seventeen Sustainable Development Goals, we are faced with a world experiencing high levels of political discord, mistrust and conflict. Nevertheless, we can take great heart from the fact that there has been of late, a wave of international consensus in support of correcting the course of our relationship with Nature.

From the WTO negotiations to end harmful fisheries subsidies, to the adoption of the Global Biodiversity Framework, from negotiations underway to create a global treaty to curb plastic pollution, to the recent adoption of the BBNJ High Seas Treaty, we see that multilateralism is achieving great advances on the environmental front.

Ocean Science is receiving more attention now than at any other point in human history and two upcoming conferences will reinforce that progress. Both are directly relevant to our work on digital twins of the ocean and I commend them to you for consideration.

The first is the 2024 Ocean Decade Conference, to be held in Barcelona from 10 to 12 April next year. The conference is being hosted by Spain and is being co-organized with UNESCO's Intergovernmental Oceanographic Commission in the latter's role as the coordinating agency of the UN Decade of Ocean Science (2021-2030). The conference will be an important moment for a wide range of stakeholders to take stock of the achievements of the first three years of the Ocean Decade and formulate a shared vision for the years ahead.

The second is the third UN Ocean Conference, co-hosted by France and Costa Rica, to be held in Nice in the south of France in early June 2025. As I'm sure you know the triennial UN Ocean Conferences are the prime occasions for the multisectoral global ocean community to support the implementation of SDG14, our universally agreed goal of conserving and sustainably using the ocean's resources. On this occasion the conference co-hosts have announced three special events to be held in juxtaposition with the conference, one of which will focus on ocean science. This special event, known as the One Ocean Science Congress, will be held in Nice from 4 to 7 June, in the week preceding the conference itself.

Ladies and Gentlemen,

As I'm sure you all know by now, the UN Ocean Science Decade Programme's, Digital Twins of the Ocean, known as DITTO, is establishing a framework to realise the great value of digital twins. The program aims to promote co-design of digital twins, to harmonise methods across communities, enable interoperability, and promote education and uptake.

DITTO is working towards closing existing gaps, so that Digital Twins of the Ocean will operate under the "no one left behind" mantra of the UN Decade of Ocean Science. Thus, it is envisioned that technological and capacity development of DITTO will be shared by all nations equally, ensuring inclusiveness particularly for those that are traditionally underrepresented and under sampled.

For the uninitiated, digital twins are virtualisations or representations of real-world objects or systems, with two-way connectivity between the real and virtual world. They have been widely used in engineering and have recently been adapted to Earth system applications. For its part, Digital Twins of the Ocean is the international marine community's vision to make informed operational, scientific, management, and policy decisions about the real-world ocean.

The realisation of Digital Twins will mean we can meet the need for globally comprehensive micro-measurements of what is going on in the ocean: how fast it is rising, warming, acidifying, deoxygenating; the rate of biodiversity loss within the ocean; its levels of permeation with microplastics and chemicals; sources of pollution; the movement of species and their exploitation by man; the state of natural ecosystems, including the seafloor; the changing patterns of ocean inversions, upwellings and currents; the list goes on, as vast as the ocean itself.

By allowing us to measure with greater accuracy, the new tools implicit in this digital revolution will help us to be better prepared for Climate Change mitigation, adaptation and disaster preparedness. They will lift our scientific knowledge and drive decision-making for marine environmental protection, all the while underpinning the rational development of the sustainable blue economy.

Backed by science and data, digital twinning will empower us to make better informed decisions on ocean governance, marine spatial planning, the restoration of marine and coastal habitats, and science-based ocean protection efforts.

Possessing this highly accurate living replica of the ocean, fed by continuous observations from thousands of sensors across the ocean, along with a wide array of satellites, will have tremendous benefits for large ocean states such as my home country of Fiji. Integrating this real-time data with risk reduction and management actions will enhance early-warning systems, improve the effectiveness of national mitigation and adaptation strategies, and build resilience for the most vulnerable of our communities.

I take it that Professor Martin Visbeck is pointing the way to future proofing when he says, “Digital Twins help us imagine possible futures and optimise implementation pathways towards that desired future.” I encourage you to dwell on that potential.

To process our understanding, Digital Ocean Twins will have solid technical foundations rooted in innovative artificial intelligence techniques. Combining advanced machine learning methods, ocean ecosystem models based on physics-guided machine learning, along with big data processing methods, there is growing confidence that artificial intelligence will help us take great strides in the understanding and operationalising of ocean science.

Ladies and Gentlemen,

I do believe in my heart, that aided by artificial intelligence, today’s young people will be the ones who discover lasting solutions to the triple planetary crisis, and that it is they who, within their lifetimes, will implement these solutions in a manner that is equitable, sustainable and respectful of Mother Nature.

I have no doubt that Digital Twins for the Ocean will help them get there, and it is thus that I encourage you to use the best of your faculties, resources, and combined energy to enable the practical, financial, and technical advances required to make this happen.

I thank you for your attention.