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Perspective | The Phoenix Islands Protected Area: The Greatest Ocean Conservation Story Ever Told

By Ambassador Teburoro Tito, Chairman of the PIPA Conservation Trust Fund Board

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On 11 December 2018, Kiribati made history by being the first country in the world to have its domestic marine conservation initiative – the Phoenix Islands Protected Area (PIPA) – recognized by the United Nations General Assembly (Resolution A/Res/73/124 titled "Oceans and the Law of the Sea") as an exemplary model of international cooperation, coordination, and collaboration in marine protection and conservation.

This complimentary recognition was reflected in Operative Paragraph (OP) 267 of the Resolution. In that paragraph the General Assembly "acknowledges the Micronesia Challenge, the Eastern Tropical Seascapes Project, the Caribbean Challenge and the Coral Triangle Initiative which seek to create and link domestic marine protected areas to better facilitate ecosystem approaches, **notes the Phoenix Islands Protected Area as a multinational partnership** and reaffirms the need for further international cooperation, coordination and collaboration in support of such initiatives."

To get that small bolded phrase inserted into paragraph OP267 of the resolution was not as easy as initially envisaged, especially in a meeting of 'expert' representatives from 193 states who attended the negotiations that lasted several weeks prior to the plenary session of the General Assembly. Many of these representatives were not enthusiastic about the PIPA insertion for fear of setting a precedent where other states might later demand the same privilege in regards to their national marine conservation initiatives.

Understandably, they wanted the Kiribati delegation to answer the question:

"What is so extraordinarily unique about the Phoenix Islands Protected Area to justify its special mention and elevation in the UN General Assembly resolution?"

To answer this question was indeed a huge challenge for the small Mission of Kiribati with only four permanent staff and one intern, and no real expertise to match the caliber of the many other experts involved in the informal consultations. The Kiribati Mission was fortunate to have the good support of delegations from Australia, New Zealand, and Canada right from the start, and these were later joined by delegations from a number of small island developing states and, much later, the European Union and the United States. This greatly eased the effort of Kiribati to turn the remaining delegations who were strongly opposed to the inclusion of the PIPA, or any nationally owned MPA for that matter, and who argued, quite reasonably, that the paragraph was meant to highlight only existing and well-known regional and multinational marine conservation initiatives.

To overcome this strong and valid argument, the Kiribati delegation had to gather, compile, and present to the informal discussions much information about the PIPA, including some of the recent scientific discoveries (e.g., the massive breeding ground for tuna, the abundance of heat-resistant coral communities and reef systems, and the highly diverse and abundant and ancient life on PIPA deep seamounts) to prove that the PIPA is a fully functional marine ecosystem contributing substantially to the health and wealth of the world's oceans – far exceeding the efforts and outputs of other nationally and regionally owned marine conservation initiatives known within the United Nations system.

This article will highlight the unique facts and success stories about the PIPA that were presented during the negotiations that led to the overwhelming support for the special mention of the PIPA in the UN General Assembly Resolution of 11 December 2018, referred to earlier.

A Kiribati Sacrifice to Humanity

From the day back in 2006 when the Government of Kiribati issued an environment conservation order, known as the Phoenix Islands Protected Area Regulations, under the Environment Act 1999 – designating the natural resources of the eight islands of the Phoenix group¹ and of the exclusive economic zone around them, covering an area of about 409,000 sq. km, as prohibited and closed to any extractive activity – many people in Kiribati questioned how this would impact on the economic development of Kiribati in general and the Phoenix Islands region in particular.

Successive administrations since independence had recognized the huge economic potentials of these uninhabited islands, with abundant fish populations and pristine white beaches, blue lagoons, and dense underwater jungles. They had attempted to turn the islands into major fishery and ecotourism assets for the nation. To suddenly close off what people had understood to be a potentially valuable part of Kiribati, comprising about 12% of its total EEZ and about 3.5% of its total land area, was therefore met with much resistance. The resistance was particularly strong from those who saw the environment conservation regulation as not in keeping with the long-held vision of these remote islands as possible hosts of resettled and relocated populations, ecotourism resorts, fishing-related industries, copra milling, and other coconut-related industries. These were long-term concerns that were raised.

A more immediate concern related to the impact this might have on the fishing license revenue of the Government. It was predicted that the closure would result in a 17% loss in tuna licensing revenue, being the computed average of the licensing income derived from tuna fishing in the PIPA area over a long period of time prior to the closure. There was also concern over the coconuts that were coming out of the massive coconut replanting scheme that had been undertaken on one of the Phoenix Islands, Orona, some years prior to issue of the closure order. This valuable resource was going to be wasted if it was not harvested and brought to the copra mill in Tarawa to add to the nation's GDP.

These important concerns were accommodated to some extent in section 6(2) of the PIPA Conservation Trust Fund Act of 2009. This law created the Phoenix Islands Protected Area Conservation Trust, an unusual non-governmental Kiribati charity set up to provide support for the conservation objectives of the closure. Section 6(2) states that the **"Trust may provide the government with reasonable compensation for loss of revenue occasioned by measures to limit or prohibit exploitation of the resources of the Phoenix Islands Protected Area to the extent agreed between the Trust and the Government from time to time pursuant to the terms of the Conservation Contract."**

Beyond the terms of the law, however, there was no real assurance of the Trust's ability to compensate the Government at the time. Nonetheless, the majority of the members of Parliament under the leadership of then-President Anote Tong welcomed the closure – more as a gift to humanity and a matter of prestige for Kiribati, but with an underlying belief that humanity, through the United Nations and beneficiary international and regional organizations and agencies, should also be in a position to compensate Kiribati for any GDP losses associated with the closure.

A Multinational Partnership NGO

The PIPA owed its beginnings to a combination of efforts of many personalities from within and outside of Kiribati. Worldwide a growing awareness of Kiribati began with an influx of foreign visitors whose curiosities were aroused by the nation's pristine beauty and cultural wealth, as portrayed in live broadcasts of Kiribati as the first nation in the world to enter and receive the first dawn and sunrise of the new millennium. This world-famous event was greeted by a moving celebration on Kiribati's Millennium Island (formerly Caroline Island) featuring traditional chanting, dancing, and singing and other cultural performances, and by the Millennium song of then-leader of Kiribati, President Teburoro Tito (author of the essay you are reading), who five years earlier had shifted the international date line (IDL) to get the whole nation of Kiribati on the same side of the IDL. Notably the song, with a theme of "World peace in harmony with Nature", stresses key elements for the achievement of lasting world peace such as the solidarity and togetherness of humanity in combating global challenges; rebuilding families, cultures, and communities where human dignity and values are treasured; and greater respect for Mother Nature.

This initial flow of Millennium visitors was later mixed with a good number of environmental, marine, and wildlife scientists and nature lovers who found the untouched nature of these remote islands to be the kind of paradise they had been searching for. Dr. Gregory Stone, who at that time was chief ocean scientist of New England Aquarium, was among the first of such ocean-loving scientists to discover what he and his fellow paradise hunters would refer to later as the "underwater Eden" below the surface of the PIPA waters. As Dr. Stone aptly put it in his first encounter with the pristine underwater jungle

as he plunged for his maiden dive into the waters of the PIPA, “It was the first time I’d seen what the ocean may have looked like thousands of years ago.” A similar sense of wonderment has been expressed by many who subsequently took their first peep into the mesmerizing look of the PIPA’s unspoiled underwater paradise.

The idea of setting aside the uninhabited islands in the Phoenix Group began to find roots in the minds of environmental staff of the government, which led then-Minister for Environment, Hon. Tetabo Nakara, and his top advisors to take a serious look at the long-term merit of such an initiative. This subsequently led to Cabinet’s approval of an order to designate the PIPA islands and their surrounding waters as a conservation area, closed to fishing and other extractive activities, as referred to earlier. In turn, this was followed by Kiribati’s acceptance of a cooperative and partnership arrangement with two US-based NGOs, Conservation International (CI) and New England Aquarium (NEA). It was on the basis of this tri-partnership arrangement that the PIPA Conservation Trust Act was enacted by the Kiribati Parliament in 2009, providing for the establishment of a novel charitable entity under the laws of Kiribati, with CI, NEA, and Kiribati as founding members. At the same time the PIPA Conservation Trust was registered in the US as a non-profit organization. The NEA has since left the partnership and the Aquarium of the Pacific of Los Angeles, California, has now joined as a partner instead.

To get the PIPA Conservation Trust Fund started and to begin the process of building an endowment for the incremental costs of managing the new conservation closure and potentially provide compensation for any GDP losses, the Kiribati Government and CI’s Global Conservation Fund agreed to contribute US\$2.5 million each towards a \$5-million endowment fund that invested in bonds and stocks. Income from that endowment fund has helped maintain the operations of the Trust and the Kiribati management of the PIPA. The PIPA Trust also dedicated itself to reaching out to other potential funders of marine conservation initiatives. As the good news about the PIPA hit headlines, more and more inquiries were received from conservation foundations, agencies, philanthropists, and others. Among those who graciously offered to help launch the PIPA Trust and the Kiribati PIPA Initiative were the Waitt Foundation and Oceans 5, a funders’ collaborative.

For the past decade or so, the PIPA Trust Board has been guided by a Science Advisory Committee (SAC) headed by Dr. Randi Rotjan, Professor of Biology at Boston University. The SAC advises the Board and Government on scientific programs and activities needed for greater understanding of the health of the PIPA and its potential value for Kiribati and the world ocean at large. The SAC carries out the scientific activities in partnership with Boston University and other universities and marine institutions in the US and elsewhere, and with funding and in-kind support from various US-based institutions such as the National Oceanic and Atmospheric Administration (NOAA), Woods Hole Oceanographic Institute, Sea Education Association, Robertson Foundation, the Atlantic Donor Advised Fund, and several others.

At regular intervals, the SAC updates the Board and shares with the scientific world its latest findings. These have added to the field of marine science in a way that will be articulated later in this article. To enhance local capacity and ownership of the PIPA scientific activities and information, Dr. Barenaba Kautu, a medical research scientist based at Harvard Medical School in Boston (US), was recently appointed as a PIPA co-scientist and the Vice Chair of the SAC. Dr. Kautu is aware of the huge potential of the PIPA becoming a source of genetic materials for the development of pharmaceuticals.

A snapshot summary of how this multinational partnership came into being could not be better described than in the words of Dr. Stone: “The conversation that began in Tarawa in 2001 marked the beginning of a remarkable partnership. The story of the Phoenix Islands shows how a simple, small action by a few individuals can grow to enlist the expertise, energy, and passion of people around the world – from ordinary citizens to professionals to policy makers at the highest levels of Government.”

A World Heritage

Soon after the establishment of the PIPA and the PIPA Trust, the Government of Kiribati submitted an application to UNESCO for the PIPA to be inscribed as a World Heritage site. This was approved in March 2010, setting a new record at the time for being the largest and deepest World Heritage Site, covering an ocean surface area of 408,250 sq. km with a depth ranging from several feet in the shallow to over 5000 meters in the deep, with an average depth of about 2000 meters. In terms of volume, the PIPA is estimated to hold about 820,000 cubic km of marine biodiversity.

Within such a gigantic volume of always-warm tropical surface water, there are 800 known species of marine fauna including 200 coral species, 500 fish species, 18 marine mammals, and 44 bird species that have been reported. We can think of the PIPA as being in a ‘Goldilocks’ zone with respect to central Pacific climate and oceanography. It is on the edge of the eastern Pacific El Niño, so heat waves have been generally less extreme and less frequent in the PIPA than on reefs further to the east. Yet the PIPA still gets nutrients that are upwelled from deep due to the trade winds, and its waters are warm enough to support the abundant life there. The conditions are “just right.”

A Natural Laboratory for Science

The absence of human activity in the PIPA (aside from a handful of caretaker officers and their families on Kanton Island), coupled with its remote locality thousands of miles from the nearest metropolitan centers, makes the eight-atoll group and surrounding ecosystems one of the least-disturbed natural laboratories on Earth. This is invaluable not only for marine scientists but other branches of science as well, including those tasked with understanding the impact of global warming and sea level rise on islands built of coral and reef materials, and on the livelihoods of island people dependent on the health and wealth of the ocean. As more scientific research is conducted in the PIPA, the area’s role in revealing how marine ecosystems function and their ability to adapt to ongoing global environmental change has become more and more critical. The PIPA is providing key information to support the sustainable management and conservation of marine areas far beyond the PIPA’s waters and around the world. Indeed the PIPA’s leadership has inspired other nations to study, manage, and conserve critical marine ecosystems.

A Breeding Ground for Tuna

In a collaborative research effort, a study was conducted to determine whether or not tuna spawning was occurring in the PIPA. Scientists from SEA, WHOI, and Boston University (including student Christina Hernandez, Dr. Rotjan, Dr. Ian Witting, and others) observed from the movement of newly hatched tuna larvae around the PIPA’s periphery that larvae are ‘born’ inside the least-disturbed, more-central part of the PIPA and slowly drift following the flow and direction of the wind and current. This is a very important finding, providing evidence that the closure of the PIPA is adding to the tuna stock of the Pacific Ocean. Put differently, the PIPA is working as a powerful ecological tool for re-stocking tuna for the Pacific. More work will be carried out to determine the quantity of tuna being produced within the PIPA. Similar studies are envisaged for determining whether other species of fish are also breeding successfully inside the PIPA, and to what extent the PIPA is contributing to re-stocking of fisheries in ways that are beneficial to all Pacific nations and the world’s tuna fisheries.²

A Nursery and Supplier of ‘Super’ Corals and Reefs

Potentially very important reefs and corals have been discovered in the PIPA and nearby islands by Dr. Anne Cohen at WHOI and her team, facilitated by the SAC and assisted by Kiribati observers. (These observers accompanied the WHOI team on multiple expeditions to the PIPA, providing critical support and local knowledge that led to these discoveries.) Findings from such research reveal that the corals in the Phoenix Islands are able to adapt to the abnormal heat that accompanies El Niño episodes and have a good chance of surviving future global warming. The ability of scientists to access the PIPA’s remote reefs over the last 20 years, deploy instruments, and conduct surveys has allowed them to study the reefs through three El-Niño heat waves, noting how they respond and recover. And by boring into the limestone base formed from layers of dead corals, Dr. Cohen is able to read the footprints of successive generations of corals that have survived through different thermal conditions. She concludes that unlike corals in other parts of the world that are swept to extinction by a sudden rise in temperature, the corals and reefs in the PIPA have survived heatwaves for hundreds of years, developing into what Dr. Cohen describes as ‘super resilient’ reefs. Many label such corals and reefs as Super Corals and Super Reefs.

Of these Super Corals, some wither or hibernate when temperature rises to a certain level, but quickly rebound and bloom as soon as the temperature returns to normal. Others are genetically wired to withstand the extreme temperature brought by El Niño; their offspring carry those resilient genes to other parts of the reef so that gradually the PIPA coral communities are becoming more heat-resistant over time. Critical to the success of PIPA Super Reefs in this time of rapid climate change is the protection afforded by the marine protected area. This is because even Super Reefs are vulnerable to pollution, overfishing, dynamiting, and dredging. Their protection within the PIPA is the best guarantee of a continuing supply of the reef-building materials needed to keep the islands’ topography on pace with sea level rise, as predicted by climate scientists.

The PIPA’s Super Reefs have inspired beyond the PIPA’s borders. The Polynesian Leaders Group of nine Polynesian nations has called for a Pacific-wide collaboration to locate, study, manage, and conserve Super Reefs. As a result, some islands are working to establish their marine protected areas to protect their Super Reefs; the Aquarium of the Pacific is committed to establish the first Super Corals exhibit; and two short films (including this) have been made and shared with 145 institutions worldwide and translated into multiple languages.

The discovery of healthy Super Reefs in the PIPA raises the possibility of farming the PIPA’s corals to restore coral reefs that have been ravaged and destroyed by global warming in other parts of the world. There is significant financial investment in coral reef restoration and in breeding genetically enhanced Super Corals to stock restored reefs. Careful farming of the PIPA’s Super Reefs could provide a steady and sustainable supply of naturally resilient corals of different species, establishing the PIPA as a restoration hub and global supplier of resilient corals for the 21st century.

A Protected Space for Ancient Corals and Sponges in the Deep Sea

The deep sea (>200 meters) of the PIPA was unstudied until 2017 when 25 deep-sea ROV dives took place from the US NOAA ship *Okeanos Explorer* and the Schmidt Ocean Institute *R/V Falkor*. On these deep-sea missions spearheaded by Dr. Rotjan and colleagues, many new discoveries were made including thriving and abundant communities of deep-sea corals and sponges, many of which were over 1000 years old. These initial studies of the deep sea revealed many charismatic creatures such as six-gill sharks and dumbo octopus, and also elucidated new species of corals, living specimens of Monoplacophorans (a class of mollusk), and completely novel bacteria unknown in the terrestrial and shallow-water worlds. These bacteria may be important in revising our understanding of innate immunity in mammals, which demonstrates the value of deep-sea exploration in protected areas where nature is still largely undisturbed. On these deep-sea expeditions, debris is also counted and it is exciting that the PIPA had relatively little marine debris in the deep sea compared to many other areas in the Pacific.

Deep-sea research in the PIPA has also brought on a new project called “My Deep Sea, My Backyard” to help bring affordable, deep-sea technology to the people of Kiribati so that we can explore our own waters. In this way (and others) UN SDG 14 goals of technology transfer, capacity building, and ocean stewardship are part of the PIPA science program. To date this project has brought two Trident underwater drones on 100-meter tethers, and a custom-built 1800-meter-rated “Reel Cam” made by Dr. Brennan Phillips of the University of Rhode Island. Dr. Rotjan and Ms. Tooreka Temari – the two co-chief scientists of the PIPA – worked together with members of the PIPA, the PIPA implementation Office, members of the Kiribati Government, local village leaders, and fishers to deploy these technologies together in partnership. The first deep-sea imagery was taken in the Gilbert Archipelago (on Tarawa, the capital island of Kiribati), revealing colorful, vibrant, and abundant life on the seafloor. All of the technology was gifted to Kiribati and remains in-country for the I-Kiribati people to use and deploy. Findings from the project and the science of the PIPA has thus far been showcased to over 2000 school children in Tarawa, helping to “bring PIPA home” as described below.

Back to Mother Nature: Bring PIPA Home

Most of the secondary activities of the PIPA Trust spelled out under section 7 of the [PIPA Conservation Trust Act \(2009\)](#) and its recently revised version of 2019 require the Trust to promote environmental conservation throughout Kiribati. This involves various means, including:

- Collaboration with local government and natural resource institutions and other interested parties to build a national commitment to environmental conservation;
- Supporting environmental awareness and education programs that promote biodiversity conservation in Kiribati;
- Activities similar to those the Trust pursues with respect to the PIPA in other protected areas within Kiribati; and
- Activities relating to the conservation of the environmental, cultural, and historical resources of Kiribati for the benefit of the public.

In short the Trust is tasked to serve the people and government of Kiribati by mobilizing local authorities, education authorities, natural resources institutions, communities, and other interested parties to cultivate a new mindset – one that elevates concern for conservation and sustainability measures over and above exploitation mechanisms. This calls for greater understanding, knowledge, and appreciation of Mother Nature's ways to sustain herself through the harm and damage suffered from human exploitation. Such education opens the way for Kiribati people to revive their rich traditional knowledge about the living and non-living things around them – particularly in the sea – that have defined their existence and development for thousands of years prior to westernization and globalization.

This is a very ambitious goal for the Trust, and one that requires far more resources than it currently possesses. However, it is pleasing to note that despite such fiscal handicap, some inroads into this huge agenda have already been made with the launch six years ago of the "Bring PIPA Home" (BPH) initiative, the appointment of the PIPA Ambassador for BPH in the person of Ms. Christine Zinnemann, and the provision of the budget needed for BPH activities.

Consequently, the conservation and cultural revival activities have started to generate the desired mindset especially in communities where the BPH Agenda has been launched. This conservation message as disseminated by the PIPA Trust has brought about encouraging changes in the minds of people who used to resist any conservation policies, rules, or laws, notably in fisheries, on the premise that it was violating their ownership and economic rights over the resources of their ocean. These people are now receptive and appreciative, and therefore ready to cooperate with such measures. It is now becoming quite fashionable for villages and communities to make their own rules to protect or conserve a resource that they consider valuable for their general wellbeing and development.³

A recent national climax of this conservation movement was the declaration of the coastal waters of Kiribati's Southern Islands as a no-take area, called the Southern Line Islands Marine Protected Area (SLIMPA), designated jointly by the ministries responsible for the Environment and for the Line islands respectively. This has led to the appointment of Kiribati, under the visionary leadership of President Taneti Maamau, as the 2019 Commonwealth champion for sustainable coastal fisheries management under the Commonwealth Blue Charter. The Blue Charter was launched by H.M. Queen Elizabeth in 2018 as an embodiment of the collective will of the 53 member countries of the Commonwealth to promote and support all efforts aimed at protecting and improving ocean health and wealth.

Conclusion

Earlier I presented the question of why the PIPA was included as an exemplary model of international cooperation, coordination, and collaboration in marine protection and conservation in the Resolution Operative Paragraph 267. What is so extraordinarily unique about the Phoenix Islands Protected Area to justify its special mention and elevation in the UN General Assembly resolution?

I hope I have begun to answer that question here. I invite everyone to learn more about Kiribati's remarkable contribution to the world: the Phoenix Islands Protected Area.

(A note of thanks: I would like to thank Members of the PIPA Trust Board and members of the SAC for their encouragement, comments, and edits, which have assisted in the final form of this article.)

Footnotes:

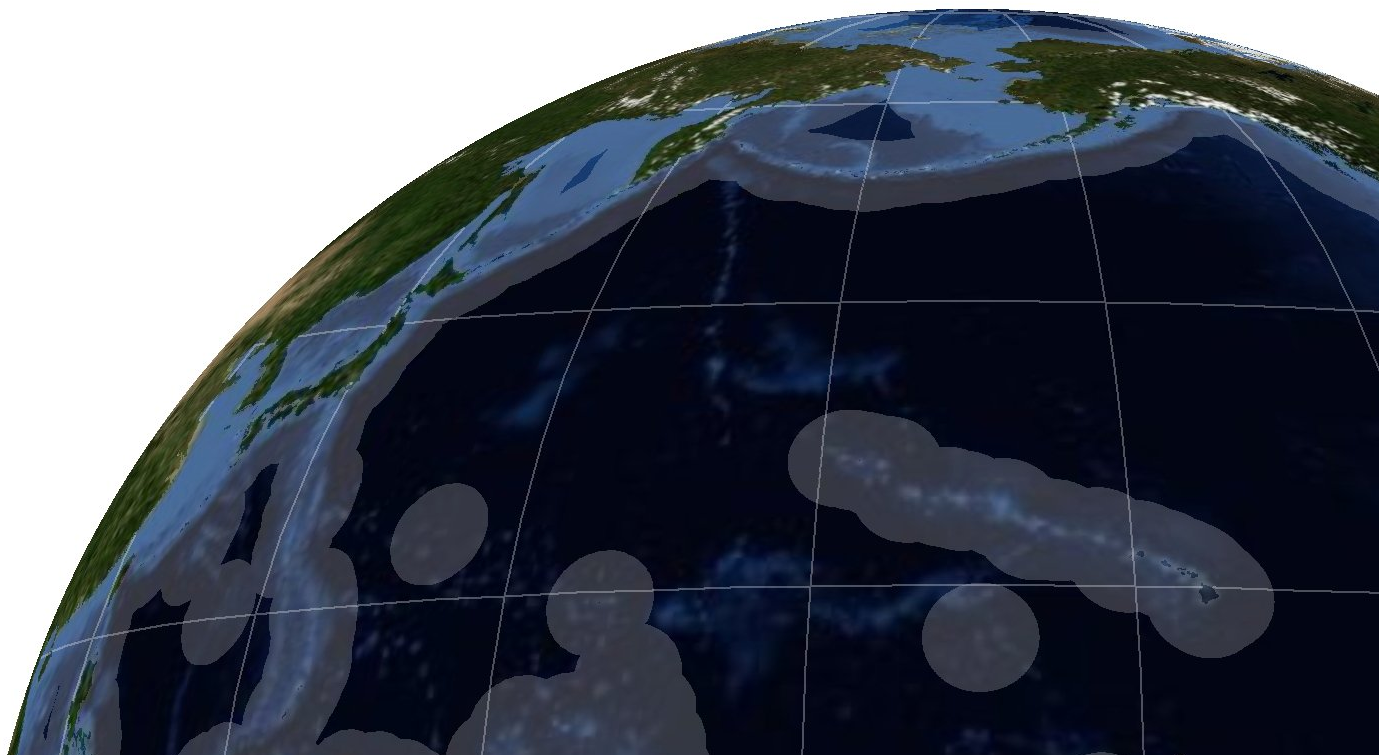
¹ The PIPA islands include:

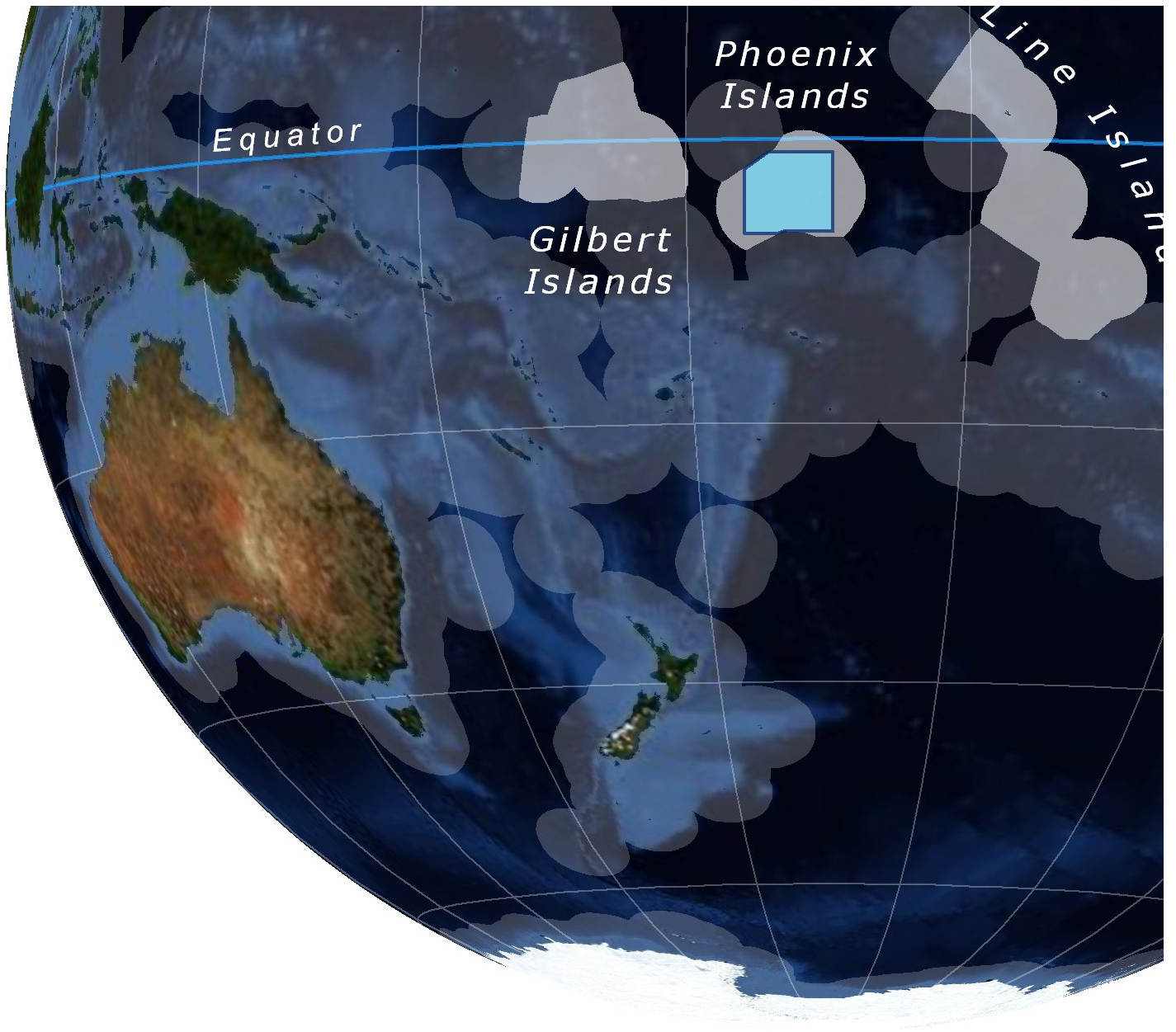
- a. Kaonton Island (a Kiribati word for Canton)
- b. Enderbury Island (named by Kiribati ancestors as *Abairiringa*, meaning 'a land under the heat of the sun')
- c. Birnie Island
- d. McKean Island
- e. Rawaki Island
- f. Manra Island
- g. Orona Island
- h. Nikumaroro Island, believed to be where the famed American pilot Amelia Earhart spent her final days as a castaway, after an attempted circumnavigation of the globe failed when her plane ran short of fuel and had to land.

² Regarding the early prediction that Kiribati would suffer a 17% loss in tuna licensing revenue from the PIPA designation, that loss has not materialized. Interestingly, the licensing revenue has increased from 2009 up to now, mainly because of the adoption of a new licensing regime by the Parties to the Nauru Agreement, or PNA. (The PNA comprises the eight major tuna countries of the Pacific – Palau, the Federated States of Micronesia, Marshall Islands, Nauru, Kiribati, Tuvalu, Solomon Islands, and Papua New Guinea.) The regime imposes a standard licensing rate for all fishing vessels regardless of origin, calculated on the number of fishing vessels and the number of fishing days. This is called the vessel-day scheme.

³ In response to BPH, a number of communities have voluntarily imposed rules on themselves against the dumping of rubbish into the sea, and have volunteered time to clean up coastlines. Others have imposed rules against the reckless use of mangrove resources and have engaged in re-planting efforts. Some villages and communities have agreed to prohibit catching of bonefish during their spawning periods. For the violation of such rules the communities impose monetary or material penalties, which a rule-breaker must pay for the collective benefit of the community.

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