



## PACIFIC SCIENCE ASSOCIATION

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# Official Resolutions of the 12th Pacific Science Inter-Congress

Suva, Fiji

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### **The Organizers of the 12th Pacific Science Inter-Congress:**

Recalling the theme of the Inter-Congress, “Science for Human Security and Sustainable Development in the Pacific Islands and Rim”, and recognizing the critical role of science, technology, and innovation in developing solutions to the challenges of global change and for the development of the nations in and around the Pacific Ocean,

Recognizing that the countries and territories of the Pacific Rim and Basin are expected to be major contributors to scientific research and sustainable solutions in coming decades,

Acknowledging that science is inherently global, and that international collaboration and cooperation are essential to successful outcomes that meet both planetary health and human needs,

### **Call upon the scientific community, governments, the business community, non-governmental organizations and local communities in the region and elsewhere to:**

- Acknowledge that the Earth is in the midst of change unprecedented in human history, the effects of which are already highly prominent in the countries and territories of the Pacific Rim and Basin and are projected to increase greatly. The planet’s natural systems, biota and human inhabitants have reached a point of such major transition that it may be said that we have entered a new geological Epoch, the Anthropocene. Because the transformations affecting the planet and human societies are interconnected and interactive, they are collectively referred to as global change. The term global change thus includes climate change, ocean acidification, biodiversity loss, invasive alien species, demographic change, social and cultural change, resource scarcity, changes in agricultural needs and patterns, economic transformations, and changes in the modalities and scales of governance.
- Recognize that science, technology, and engineering play critical roles in developing solutions to address global change. The highly complex inter-connectedness as well as the very large scales under which global change operates require more integrative and holistic mindsets and approaches that appreciate how phenomena are linked together as systems, and how they may be interpreted within multiple contexts. Inter-disciplinary, multi-disciplinary, and trans-disciplinary approaches to science and technology are imperative because they offer greater potential to facilitate the outside-the-box thinking and cross-fertilization that generate knowledge and innovation.



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- Place greater emphasis on human security, which focuses on the full spectrum of individual and community livelihood and well-being and encompasses food, water, energy, health, cultural vitality, and personal security. We call upon all stakeholders to recognize that human security is equally important as (and linked to) national security concerns.
- Recognize that climate change is both a moral and a technological challenge. Climate change is primarily caused by human activities, and driven mainly by greenhouse gas emissions from the world's large economies, but with a significant contribution from agriculture- and timber-related deforestation and forest degradation. Sea-level rise associated with anthropogenic global warming presents a threat to the survival of some Pacific Island nations. It is therefore incumbent on responsible countries to take the lead in recognizing their role in contributing to climate change, and mitigating its effects by changing the behaviors that cause it. However, there is a major disconnect between the combined strength of scientific and empirical evidence for human influence on global environmental change, and the political recognition of this evidence by industrialized nations and efforts to initiate steps to mitigate these changes. Because national economies are currently based on fossil fuel-derived energy, achieving timely international coordination and cooperation leading to national responses is a great challenge. The importance of behavior changes that result from moral choice and economic incentive is undeniably critical, but framing the issue as primarily a technological challenge may be an equally or more effective strategy. High income countries should invest more heavily in R&D for near-zero carbon energy technologies, carbon sequestration and removal and/or other novel energy solutions and mitigation technologies. If these are developed and deployed more rapidly, they offer transformative potential to avoid catastrophic climate change impacts, and may also offer more socially equitable access to sustainable energy in low-income areas.
- Support "Future Earth", a new 10-year international research initiative organized under the auspices of ICSU, ISSC, Belmont Forum, UNESCO, UNEP, United Nations University, and other international institutions that will engage the scientific community, policymakers, and other stakeholders in an open, collaborative process to develop the necessary knowledge to respond effectively to the risks and opportunities of global environmental change, and to support transformation towards global sustainability in the wake of Rio+20. Future Earth aims to develop a globally-distributed network of knowledge nodes in order to be responsive to needs and priorities of decision-makers at regional and national level, and we encourage them to fully engage with the Pacific Island community in order that the Pacific Islands perspective and solutions can be articulated in a prominent global forum and also that the particular concerns of the region can be better addressed.
- Encourage the science community to develop better and more effective communications strategies. For decades, scientists have assumed that providing scientific evidence is sufficient to inform opinions and motivate behavioral change, and yet this strategy has had limited success. It is therefore critical to recognize that while science is the best tool yet devised by humankind to answer fundamental questions about how the natural world works, science also operates within other spheres of meaning (cultural, social, economic, religious, political). As a result, scientists should recognize that the acquisition and communication of new knowledge alone is insufficient, since scientific results are interpreted through people's



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pre-existing cultural and political biases. We strongly encourage greater involvement by social scientists and professional science communicators in the sharing of information toward a more collaborative engagement with multiple, diverse stakeholders.

- Recognize that while improving scientific literacy remains essential, effective science now also involves engaging in a dialogue with the non-science community to help establish consensus on behaviors that are more consistent with sustainability principles. This mode of science research is not simply cross-disciplinary or even multi-disciplinary, but emphasizes trans-disciplinarity: communicating and collaborating with non-science stakeholders in various stages of the scientific process, incorporating indigenous and local understanding of natural phenomena as part of the solution to problems, and stressing how scientific research can be utilized by policymakers, resource managers, and other stakeholders.

### **The Organizers of the Inter-Congress recognize these issues of particular relevance to the Pacific Islands and recommend the following actions and approaches:**

- The main obstacles to sustainable development in the Pacific Islands include climate change, biodiversity loss, deterioration in equitable access to food and health security, and intensification of the environmental, social and economic impacts of extreme meteorological and natural hazard events. There is a consequential need for adaptation, innovative solutions, and building resilience.
- The Pacific stands to be among the areas of the world most negatively affected by climate change. It is therefore critical that the Pacific Island community become more actively engaged and empowered in global discussions of climate change. Pacific Islanders have much to contribute to the understanding of climate change, in the entire range of contexts from physical to biological to cultural. While it is important for the Pacific to understand their region in the larger context of global change, it is essential to engage and organize communities to ensure that their voices are heard. This should involve people-centered actions and dialogues to establish networks that can enhance communities' resilience to climate change, as well as more prominent advocacy in encouraging high-income nations to develop and deploy global scale negative-emissions energy technologies and strategies.
- In the absence of urgent and effective mitigation and adaptation measures, the impacts of climate change on human health will be very significant. In order to address a critical data gap that inhibits robust and timely assessments of climate impacts on health, Pacific nations need to put a higher priority on the collection and open availability of high-quality climate and meteorological data and to support ongoing work by national meteorological agencies. It is also necessary to strengthen health information and surveillance systems for better decision-making for health adaptation, including a focus on local capacity-building in the analysis and use of existing information. Cross-sectional, trans-disciplinary research and knowledge sharing, including indigenous knowledge and participatory approaches is also important to encourage collaborative research and policy development and implementation at all scales from government to community level. There is a critical need for new and additional financing and support in areas of human and financial resources, equipment, and technical expertise to implement existing climate and health policies. We strongly encourage the



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mainstreaming of climate change and health issues into formal curricula at the primary, secondary and tertiary levels in health and other training venues, and support the integration of climate change and health into existing and future legislation and development policies.

- Addressing the loss of terrestrial, freshwater, marine, and agricultural biodiversity and ecosystem services remains critical to mitigate impacts on food, health, and energy security in the region. The loss of bio-cultural diversity is one of the main underlying threats to conservation and sustainable use of biodiversity through the loss of effective resource management systems. Put another way, the loss of biodiversity undermines traditional cultural systems, and conversely, the erosion of cultural traditions weakens the basis of biodiversity protection.
- The rapid urbanization in the Pacific Islands is linked to the region's high rates of food and energy dependency and non-communicable disease. Given these factors, promoting poly-cultural urban and house yard gardening is an important way to help ensure food, health, and livelihood security as well as to help protect the provision of ecosystem services. More holistic approaches to Pacific Island development, which include the best modern science, both help maximize local resilience in the face of global change, and may also serve as potential models for food security and ecosystem resilience in other rural areas of the world.
- The vast geographic distances of the Pacific and relatively high costs of transportation present an ongoing challenge to the participation of Pacific Islanders in international fora and to their desire to collaborate with international partners. However, rapid and ongoing advances in information technologies offer potential partial solutions to problems of distance and inclusion. The use of web-based collaboration tools can and should play a more important role in scientific collaboration across the region. The University of the South Pacific has developed impressive capabilities to link its distributed campuses using videoconferencing and other web-based tools, and we urge Pacific Island stakeholders to expand and engage in opportunities for technology-based distance collaboration.
- Formal education, and especially tertiary education, in the Pacific region deserves increased attention and funding to build human resource capacity to support sustainable development and human security.
- The pervasiveness of violence against women (VAW) in the Pacific region needs to be addressed by policymakers and communities. Evidence presented at the 12<sup>th</sup> Pacific Science Inter-Congress shows that while patterns and types of VAW differ between island countries and territories, VAW has significant short and long-term adverse consequences on women's health. Evidence from research on VAW can be effectively used for policy and programs to prevent and address domestic violence in countries where such data exist. We reaffirm the Agreed Conclusions on the elimination and prevention of all forms of violence against women and girls adopted by the 57<sup>th</sup> Commission on the Status of Women (2013) and recognize the different forms and manifestations of violence against women, in different contexts, settings, circumstances and relationships, and that domestic violence, in particular violence by intimate partners, remains the most prevalent form that affects women of all social strata globally. We condemn all forms of violence against women and girls and explicitly ask



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stakeholders to refrain from invoking any custom, tradition or religious consideration to avoid their obligations with respect to its elimination as set out in the UN's Declaration on the Elimination of Violence against Women (1993). We acknowledge the important role of data collection on the prevention and elimination of violence against women and girls and strongly endorse the need for better data collection and research on this topic in countries or areas that lack such data. We also support continued multidisciplinary research and analysis on the structural and underlying causes of, and cost and risk factors for, violence against women and girls and its types and prevalence, in order to inform the development and revision of laws and their implementation, policies and strategies, and make such information public to support awareness-raising efforts.

- Taxonomic research provides critical tools for our basic understanding of biological diversity and for the effective management of natural resources. Traditional taxonomic approaches based on morphology are the foundation of our knowledge of life in the Pacific and remain important, but given the scope of the taxonomic endeavor and constrained budgets, new techniques will also be needed to discover and understand species that are small or microscopic, show few outward differences despite significant genetic divergence, are very rare, or inhabit poorly explored habitats. Innovations such as DNA barcoding and online access to digitized information about biological collections will be important additions to traditional taxonomic approaches. Pacific nations will need to train and retain taxonomists that are adept at an expanding range of approaches and open to international collaborations that will enhance their capabilities. PSA supports the strategy of creating international, open-source research frameworks in the Pacific that include: training of next-generation taxonomists with a broad range of skills; facilitating access to the most modern technologies for taxonomic research; promoting programs of research leading to species discovery and better understanding of population biology, fragility, and resilience in the Pacific; and productive collaborations between researchers and users of taxonomic data for applications that benefit the people of the Pacific.
- Invasive alien species (IAS) remain a significant threat to native Pacific biodiversity, ecosystems, and human well-being and require urgent attention. The impacts of IAS alone and together with other global change stressors undermine human security and sustainable development, particularly on small islands. Pacific countries and territories are therefore encouraged to intensify research collaboration and management knowledge-sharing amongst themselves and with existing regional and international institutions, organizations and partnerships to better mitigate biosecurity threats and IAS impacts through the development and implementation of regional and national invasive species action plans.
- There is a need for an enhanced focus on cooperative international action for the conservation and sustainable management of trans-boundary species that move in and around the Asia-Pacific Rim and Basin.
- Illegal fishing poses a very significant threat to the sustainability of Pacific Island fisheries resources and undermines the region's economies. Legal over-fishing also remains a considerable problem. Better regional and inter-institutional cooperation to develop, coordinate, and enforce science-based fisheries management plans is essential. Given the





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vast scope of Pacific Island seascapes, however, effective enforcement remains a great challenge. Unmanned aerial vehicles (UAVs; aka unarmed, camera-equipped “drones”) are being deployed in other environmentally critical parts of the world to remotely monitor wildlife and help prevent wildlife poaching. We encourage Pacific Island stakeholders to investigate the potential of UAVs, in combination with real-time or near real-time satellite imagery, to cost-effectively monitor key fisheries resources for the many areas that are currently unpatrolled.

- Ciguatera fish poisoning (CFP) occurs throughout the tropics and is associated with the degradation of coral reefs - in particular the transition (i.e., phase shift) from healthy reef to macroalgae-dominated reef. Consumption of contaminated seafood causes debilitating gastrointestinal, cardiac and neurological symptoms, and even death. The debilitating effects of this disease place an increased burden on coastal communities and national health services. Because of a lack of government attention, the true extent of ciguatera illness and impact on human communities and ecosystem health is still poorly understood, but there have been an estimated 500,000 poisonings across seventeen island nations in the last thirty years. The PSIC-12 endorses the Suva Declaration of 2002 on ciguatera, which includes the call for more effective reporting and research as a high priority for governments and research funders. We urge that this issue receives the urgent and full attention by international bodies (WHO, IOC/UNESCO, SCOR, IPHAB, WESTPAC, FAO, Pacific Forum), regional bodies (SPC, SPREP, FFA, Tuna Commission) and country and provincial governments in the region.
- Integrated and ecosystem-based approaches that protect intact habitats and restore degraded habitats support essential ecosystem services should be encouraged. Such natural solutions deliver adaptation to climate change and disaster risk reduction – especially to the most at risk communities – and reduce vulnerability to primary risks such as flooding while maintaining intact habitats that provide the basis for long-term food security and sustainable development.
- There is increasing evidence from ecological studies that island ecosystems are not always simply “fragile”, but also possess important elements of resilience that assist their ability to adapt to global change. PSA recognizes the work of the Pacific-Asia Biodiversity Transect Network (PABITRA) in advancing scientific knowledge of the Pacific Island ecosystems, enhancing local capacity and intra-regional collaboration, and integrating traditional knowledge and local expertise. A new, renewed phase of PABITRA would help identify the Pacific Island species and processes that maintain and enhance ecosystem resilience, and facilitate Pacific Island capacity to manage natural resources in response to global change pressures.

*Compiled and edited by the PSA Council Resolutions Committee: Burke Burnett (PSA Executive Secretary), Chang-Hung Chou (PSA Vice President), Phil Cowan (PSA Council Delegate, New Zealand), Sang-Bok Han (PSA Council Delegate, Korea), and Kevin Johnson (PSA Council Delegate, USA).*