

Biography of Prof. Dr. A'an Johan Wahyudi

Prof. Dr. A'an Johan Wahyudi is a Research Professor of Marine Biogeochemistry and currently serves as the Head of the Research Center for Deep Sea at the National Research and Innovation Agency (BRIN), Indonesia. Over nearly two decades of scientific career, he has established himself as one of Indonesia's leading marine biogeochemists, with internationally recognized expertise in ocean carbon cycling, marine carbonate systems, ocean acidification, deoxygenation, and the interactions between climate variability and marine ecosystems. His work integrates observational oceanography, biogeochemistry, climate science, and data-driven approaches to advance understanding of tropical marine environments and support evidence-based ocean governance.

Prof. Wahyudi earned his Doctor of Philosophy in Sustainable Environmental Studies from the University of Tsukuba, Japan, following his undergraduate studies in Biology at Brawijaya University, Indonesia. His scientific career began at the Indonesian Institute of Sciences (LIPI), where he developed extensive experience in marine biogeochemistry and coastal ecosystem research before continuing under BRIN following Indonesia's national research integration. He later expanded his international research experience through postdoctoral appointments at the University of Tsukuba and Nanyang Technological University (NTU), Singapore, where he conducted advanced studies on organic carbon dynamics and carbonate chemistry in Southeast Asian shelf seas.

Throughout his career, Prof. Wahyudi has focused on understanding how physical, chemical, and biological processes regulate the cycling of carbon and nutrients in tropical coastal and shelf ecosystems. His research encompasses dissolved and particulate organic carbon, marine carbonate chemistry, blue carbon ecosystems, ocean acidification, hypoxia and deoxygenation, carbon sequestration, and climate-driven biogeochemical variability. By combining field observations, laboratory analyses, long-term monitoring, statistical modeling, machine learning, and numerical approaches, he investigates how marine ecosystems respond to both natural climate variability and anthropogenic environmental pressures.

In recent years, his research has expanded toward integrated ocean observing systems and deep-ocean science. He actively promotes sustained marine biogeochemical observations, development of marine data intelligence, and integration of multidisciplinary ocean observations to improve climate prediction, marine resource management, and ecosystem resilience. As Head of the Research Center for Deep Sea, he leads strategic initiatives to strengthen Indonesia's deep-sea exploration capacity, ocean observation infrastructure, and marine scientific collaboration while supporting national priorities in ocean sustainability and the blue economy.

Prof. Wahyudi has successfully led numerous nationally and internationally funded research projects. His research grants include programs supported by BRIN, LIPI, the Japan Society for the Promotion of Science (JSPS), JASTIP Network, the ASEAN-UNDP Archipelagic and Island States (AIS) Forum, and the Singapore Academies South-East Asia Fellowship. His projects have addressed a broad range of topics, including ocean carbon dynamics, climate variability in the Indian Ocean, blue carbon, coastal monitoring systems, marine carbon sequestration, smart sensing technologies, and tropical shelf-sea biogeochemistry. Earlier in his career, he also served as Chief Scientist of the Widya Nusantara Expedition, leading multidisciplinary oceanographic exploration in the eastern Indian Ocean.

Beyond research, Prof. Wahyudi has demonstrated strong leadership in scientific organizations and international collaboration. He serves as Chairman of the Indonesia Marine Biogeochemistry Forum (IMBF), Indonesia's National Contact and Scientific Steering Committee member of the Integrated Marine Biosphere Research (IMBeR) programme, and a Scientific Steering Group member of the UN Ocean Decade COSMEC Programme under IOC-WESTPAC. He is also the General Secretary of the Indonesian Oceanologist Association and has actively contributed to strengthening regional and global cooperation in marine science, ocean observation, and science diplomacy.

His contributions to science have been recognized through numerous distinctions, including being named an Outstanding ASEAN Science Diplomat and receiving the title of Research Professor from BRIN. His scientific output includes influential publications in leading international journals such as *Marine Pollution Bulletin*, *Biogeochemistry*, *Marine Environmental Research*, *Organic Geochemistry*, *Regional Studies in Marine Science*, and *Environmental Monitoring and Assessment*. His recent studies have advanced understanding of Southeast Asian ocean acidification, tropical dissolved organic carbon dynamics, Indonesian seagrass carbon emission factors, and biogeochemical variability in coastal and shelf ecosystems.

In addition to his scientific achievements, Prof. Wahyudi is committed to translating scientific knowledge into policy and societal impact. He actively promotes open marine data, integrated ocean observing systems, capacity development for early-career researchers, and stronger partnerships among academia, government, and international organizations. His work contributes directly to the implementation of the UN Decade of Ocean Science for Sustainable Development and supports Indonesia's vision of sustainable ocean management through science, innovation, and international collaboration.

Looking ahead, Prof. Wahyudi continues to advance interdisciplinary research at the interface of oceanography, climate science, and marine biogeochemistry while strengthening Indonesia's leadership in deep-sea research and global ocean observation. Through scientific excellence, collaborative leadership, and commitment to mentoring future generations of researchers, he remains dedicated to generating knowledge that supports resilient marine ecosystems, sustainable blue economies, and informed environmental decision-making on regional and global scales.