

Angel C. Alcala

Grand Old Man of Philippine Marine Science

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The scientific career of **Angel Chua Alcala** started in the terrestrial realm, and not in marine habitats where he made his name (60% of his technical papers, Appendix A), as people are wont to expect. He was the first Filipino scientist to conduct in-depth research in Philippine herpetology in the mid-1950s, which led to the discovery of 50 species of amphibians and reptiles (e.g., Alcala and Brown 1957).

Childhood and early education

Marine research would follow later, perhaps harking back to his childhood experience of catching fish, crabs, and shrimps from a backyard pond for home consumption and market sales, and also catching *bangus* (milkfish) fry for sale to pond operators. This was in his hometown of Cauayan, Negros Occidental where he attended elementary and high school, a rural setting which allowed him to enjoy the then relatively untouched forests and seas of the island. Such idyllic escapades in the countryside planted the seeds of conservation and environmental protection in the future marine biologist.

After high school, he proceeded to study at Silliman University (SU) in nearby Dumaguete City, finishing a B.S. Biology degree *magna cum laude* in 1951, despite working part-time as a laboratory assistant to supplement his income. After graduation, he taught college briefly in Cotabato in Mindanao, then returned to SU to join the Biology Department as an instructor. At SU, he was mentored by his colleague Prof. Dioscoro Rabor and Dr. Walter Brown of Stanford University, experts in amphibians, reptiles, and birds. They were both instrumental in his starting an M.A. Biological Sciences program at Stanford University. Later, he returned to the same university for a Ph.D. program, in Biological Sciences, which he finished on a Fulbright fellowship in 1966.

Herpetological research and Marine Protected Areas (MPAs)

All throughout this period until the 1960s, Alcala continued his research on amphibians and reptiles, after undertaking months of fieldwork in pristine forests in Luzon and Visayas, and Agusan in Mindanao (Figure 1). Such extensive research produced many scientific papers including the discovery of dozens of new species of frogs and lizards (Alcala 1986). His research team collected specimens, described new species, published their findings, and sent around 30,000 specimens to museums in the U.S. At present, however, such wildlife collections in great numbers are no longer allowed, given the alarming rate of species extinction in the Philippines.

From terrestrial amphibians and reptiles, Alcala's attention shifted to their marine counterparts, specifically the sea turtles locally called *pawikan*. Noting the popularity of their shells as souvenir items and their eggs and meat for food, he started studies on turtle behavior, life history, and population sizes using the mark-recapture method. Based on their findings, Alcala and colleagues recommended protection of nesting sites, conservation of their coral reef habitats, and a halt to the commercial exploitation of turtle shells.



Figure 1. A young Angel Alcala (leftmost, back row) and his men in recycled post-war uniforms while collecting specimens in the forests of Bohol, early 1950s (photo courtesy of Alcala Family).



Figure 2A. Dr. Alcala dedicated his life to research, as shown in these photos spanning decades (from left): holding a dead giant clam, checking an oxygen tank before a scuba dive, and resting after another dive (photos courtesy of Alcala Family).

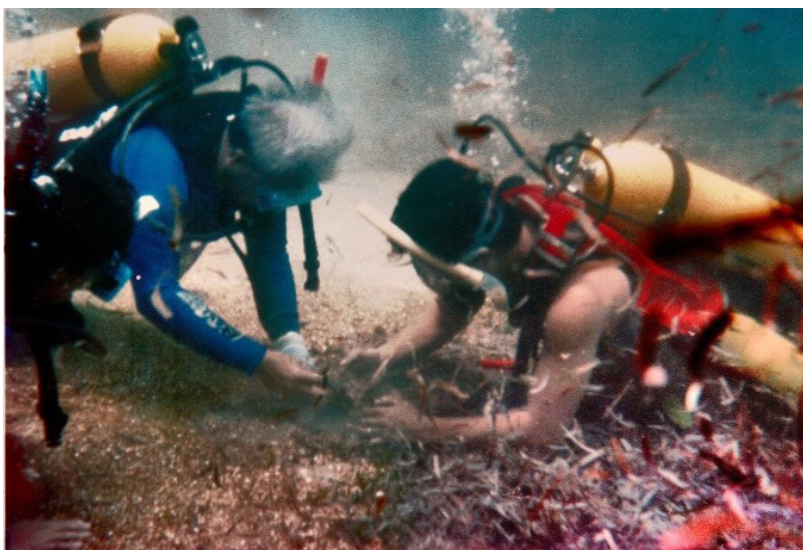


Figure 2B. Loving the sea as much as the forests, Dr. Alcala (left) was in his element scuba diving (photo courtesy of Alcala Family).

The *pawikan* studies formally started Alcala's long-running love affair with life under the sea (Figures 2A and 2B), mostly shared with the outside world through dozens of scientific papers and many more public lectures and other talks. Even during the busiest weeks in his stint as DENR Secretary, his colleagues in the government recall that he would take a few days off for some scuba diving in a nearby resort. In the first experimental Marine Protected Area (MPA) he

established in Sumilon Island, Cebu in 1973, coral reef habitats became protected not only for turtles but for fish as well (Alcala 1980). This was against the backdrop of declining fisheries due to destructive fishing practices and human pressures. Monitoring daily fish catch of some 100 fishers by his team demonstrated that 75% of a given fishing area could produce substantial fish yields so long as 25% of the area was protected from fishing — since then referred to as the 25% Solution.

Dramatic decreases in fish catch with the failure of MPA enforcement in Sumilon after 10 years provided new insights. Alcala hypothesized that sustainable fish yields were due to “spillover” or net export of adult fishes from the MPA to the open fishing areas while protection was being enforced. This hypothesis was confirmed by research in Apo Island, Negros Oriental where he helped set up the first Philippine MPA managed by a local community (Russ and Alcala 1996).

Moreover, Alcala and longtime collaborator Garry Russ (of James Cook University, Australia) started an environmental monitoring program in Sumilon and Apo in 1983, now one of the longest-running in the world (Russ and Alcala 2003, Alcala 2017). The ecological and social lessons that locally protected and managed MPAs can help restore biodiversity and reverse declines in fish stocks have served as models for the expansion of MPAs, presently numbering over 1,600 across the country (Alcala 2017). No-take MPAs have now been institutionalized by the government as part of the Local Government Code (Republic Act 7160 of 1991), and the Fisheries Code (Republic Act 8850 of 1998).

Science does not end with the completion of a research project and the writing of a report. Results have to be shared with the public through a scientific paper in the first instance, but only after a rigorous process known as peer review. After finishing a research study, Alcala with his colleagues wrote a manuscript to include results, conclusions, and other aspects of the study for submission to peer-reviewed journals.

As of late 2022, Alcala had published 200 scientific papers in journals and 36 in proceedings, and another 39 books, book chapters and book reviews, and others for a total 275 technical publications (Appendix A). Equally important as his H-index of 37 for peer-reviewed papers (Scopus May 2023), is the predominance of multi-authored articles (79%) over single authorship (21%). This reflects the collaborative nature of most of his research — from the 1950s teamwork with mentor Walter Brown to a recent review on coral cover and fish biomass written with Gary Russ and other colleagues (Russ et al. 2020).

These scientific findings were not only shared with his peers in various national and international conferences, but also with non-technical associations (NGOs, civic organizations, and cause-oriented groups), and the

younger generation, especially students. To maximize his advocacy, he wrote a weekly column “Environment Connection” for a local newspaper (*MetroPost*) simultaneously published in a national broadsheet nonstop from 2000 to 2023, and two other columns: Agriculture and Environment for *Malaya* (2005-2017) and Environment with Angel Alcala for *Visayan Daily Star* (from 2007). His column topics covered marine life, MPAs, coral reef regeneration, pollution, urban decay, forest cover, and even beach forests (Olmedo and Guerrero 2017).

Public service and awards

In recognition of his unique and excellent combination of scientific expertise and administrative experience, he was named Secretary of the Department of Environment and Natural Resources (DENR) from 1992 to 1995. This was followed by the chairmanship of the Commission on Higher Education (CHED) from 1995 to 1999 during which he promoted research programs in biodiversity, marine ecosystems, and river systems in the country. He also served as Deputy Executive Director of the Department of Science and Technology Philippine Council for Aquaculture and Marine Research and Development (PCAMRD), where he gave this author career-changing Ph.D. advice to shift from Shrimp Aquaculture to Shrimp-Mangrove Ecology. Before joining the government, Alcala served on the faculty of Silliman University, rising from the ranks of instructor to professor, Dean of the College of Arts, and, eventually, University President. He also founded two research institutions—the SU Marine Laboratory (renamed as Institute for Environmental and Marine Studies) and the SU Angelo King Center for Research and Environmental Management (SUAKCREM), serving as Board Chair of the latter.

In recognition of his prodigious research output, environmental advocacy, and dedicated public service, a host of national and global awards have been heaped on Alcala. These awards are mere “shortcuts” for his enduring contributions to science and society, to quote one of his admirers, and the most noteworthy among them follow (in chronological order):

- Ramon Magsaysay Foundation Award for Public Service (1992; Figure 3; Appendix B)
- Pew Fellowship in Marine Conservation (shared with Gary Russ, 1999)



Figure 3. Dr. Alcala joins his 1992 co-Ramon Magsaysay Foundation awardees paying a courtesy call on then President Fidel Ramos.



- Academician, National Academy of Science and Technology Philippines (2004)
- DOST Outstanding Men and Women of Science, Department of Science and Technology (2008)
- National Scientist, National Academy of Science and Technology Philippines (2014; Figure 4; Appendix C)
- ASEAN Biodiversity Hero (2017)

His humanity

But behind the public persona of an international awardee and public servant, scientist, and mentor, what are the traits and habits that made Angel Alcala a human person? An excellent source of information is his biography written by Olmedo and Guerrero (2017) which gives a comprehensive account of both his career and personal life. From interviews with his immediate family and close friends, the sterling qualities of integrity, honesty, humility, and hard work emerge.

His love for animals could be seen in their home menagerie of cats, dogs, and turtles, and the occasional frogs, snakes, lizards, wild cats, bats, parrots, and other birds brought home from field trips. When he could, he took his kids on nature trips, but he was also an old-fashioned disciplinarian. He was a devoted husband and father (Fig. 5) who always provided for his six children even when he was away for graduate studies in the U.S. His biography (Olmedo and Guerrero, 2017) recounts how he saved the dormitory allowance from his monthly stipend by doing chores at a retired professor's home in exchange for free lodging. The savings were regularly sent to his wife Naomi in Dumaguete to cover the ever-increasing living and schooling expenses of his large brood. Likewise, he had a deep faith in God as a steadfast Christian, unfailingly serving in various positions on the local church council.



Figure 5. A devoted family man, Dr. Alcala and wife Naomi were blessed with six children, 17 grandchildren and 14 great-grandchildren (photo courtesy of Alcala Family).

Even as a high government official, he retained his simple tastes. To wit, he would not hesitate ordering *sinugbang isda* (grilled fish) and boiled vegetables for luncheon meetings with businessmen instead of more sophisticated cuisine. He was also quick to give a piece of his mind if people or events did not come up to his expectations. And yet everything considered, he was so well-liked and widely respected that friends and associates describe him as a personal hero or idol or icon — names all befitting Angel Alcala who was larger than life, indeed.

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APPENDIX A: List of Publications

I. Marine Biology

A. First Author

Alcala A.C. 1957. Sea urchin eggs: Their uses in the laboratory with notes on *Tripneustes gratilla* (Linn.). Silliman Journal 4:192-197.

Alcala A.C. 1969. Book Review: The Ocean Adventure by Gardner Soule. Silliman Journal 26:221-222.

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Alcala A.C. 1976. Preliminary notes on the distribution, food habits, gonad index, and use as human food of echinoids of Sumilon Island, off southwestern Cebu Island. Silliman Journal 33:286-293.

Alcala A.C. 1977. Possible effects of water pollution on coral reefs of Negros Island, Philippines. Proceedings of 4th Regional Seminar on Biological and Agricultural Research, Xavier University, Cagayan de Oro City, April 21-23, 1977 NRCP Bulletin No. 63, pp. 54-67.

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Alcala A.C. and Luchavez J.A. 1980. Notes on the spawning and early development in the laboratory of the fish *Siganus guttatus* (Bloch). Silliman Journal 27:143-148.

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APPENDIX B: RM Award Citation

ANGEL CHUA ALCALA

1992 Ramon Magsaysay Award for Public Service

The warm shallow seas of island Southeast Asia host one of the planet's most productive natural systems. Coral reefs are nurseries for sea life of an astonishing variety and abundance, providing livelihood for fisherfolk and food for millions. But humans have preyed too hard upon the reefs. Today, in the Philippines, 70 percent have been damaged or destroyed by predatory exploitation and pollution, and none has escaped harm. We now know that we must save what can be saved; this requires prudent restraint. But how can we rehabilitate what has been badly damaged, and bring back vitality to what has been nearly lost? This task requires the practical application of science and has been the life's work of marine ecologist ANGEL C. ALCALA.

A child of sea-bathed Visayan Islands, Alcala marveled at the wonders of coral reefs long before he understood them. At Silliman University, he took up biology and pursued it through a doctorate at Stanford University. Returning to the Philippines, he made his career at Silliman, advancing 1991 to become the school's president.

As a young scientist, Alcala taught Zoology, Anatomy, and Botany to Silliman students and explored the local rainforests for undiscovered varieties of reptiles and amphibians. In 1974 he established the Silliman University Marine Laboratory. Based here and working in collaboration with his research colleagues and students, Alcala embarked on path breaking research.

On the island of Sumilon, Alcala established his country's first marine sanctuary. Here he observed that a healthy coral reef can yield sea life six times greater than previously thought possible. Moreover, Alcala's research revealed that if just one-fourth of a reef is protected, the rest can be used as a fishing zone, providing a substantial livelihood for nearby coast dwellers. When Sumilon's reef was badly plundered after losing its protected status, Alcala learned another lesson: Involve local people! On Apo Island, Silliman's team worked hand-in-hand with local fishing families from the beginning; today, the university has withdrawn and the people manage the restored reef themselves. These hopeful findings are now being put into practice throughout the Philippines. "This is my vision," says Alcala, "a series of marine reserves in all the islands, all contributing to keeping the surrounding seas healthy."

Keeping the seas healthy and bountiful for growing numbers of Filipinos has been the object of much of Alcala's research. He built the Philippines' first artificial reef, now a model for dozens of others. He induced the near-extinct giant clam and Philippine crocodile to reproduce in captivity and developed breeding programs for other valuable sea animals. He monitored the health of fish, corals, seagrasses, and mangroves throughout Central Visayas and taught coastal communities how to increase the productivity of precious shallow waters. He studied the effect of pollution on marine organisms. As he learned, he also spoke out."

Alcala is a conservationist who gets the facts first. Based on thorough research, he defended Negros Island's surviving patch of virgin rainforest from hydro-electric dams and tourism and helped to evict commercial seaweed producers from the unique Tubbataha reef — now the Philippines' first National Marine Park. Alcala's forceful and reasoned stand for the environment is unwelcome in some quarters. But this down-to-earth scientist, who prefers the sea breezes to air-conditioning, carries on fearlessly nevertheless, mindful of the Bible's teaching that "We are the stewards of Creation.

In electing Angel C. Alcala to receive the 1992 Ramon Magsaysay Award for Public Service, the Board of Trustees recognizes his pioneering scientific leadership in rehabilitating the coral reefs of the Philippines and in sustaining for Filipinos the natural abundance of their country's marine life.

Citation read by Patricia A. Sto. Tomas, Trustee, Ramon Magsaysay Award Foundation

APPENDIX C: NAST National Scientist Citation

Malacañan Palace
Manila

Be It Known To All Men By These Presents:

That I,

Benigno S. Aquino III,
President of the Philippines

by virtue of the powers vested in me by law,

In recognition of his outstanding contributions and unparalleled achievements in science and society as a researcher, scientist, and administrator where he was recognized internationally and locally;

For his extensive and scholarly activities, such as his seminal and original research on the systematics, ecology, and conservation of vertebrates, particularly in herpetology by providing valuable basic knowledge on the country's rich biodiversity and ecology;

For serving as a pioneer scientist and advocate in the protection of coral reefs leading to a national policy and program of establishment of no-take marine protected areas, which had been cited internationally and immortalized in the Shedd Aquarium in Chicago as a model of coastal resource conservation and management;

For spending his professional life as an academic leader, an institution builder, and reluctant public administrator, specifically for his election as president of the Silliman University, where he helped institutionalize scientific research on marine systematic, ecology, and conservation and his appointment to two sensitive positions in the Cabinet, serving as Secretary of the Department of Environment and Natural Resources and later as Chair of the Commission on Higher Education, where he served with probity, integrity, and transparency;

For his original and significant publications which are remarkably substantive on both ecological and taxonomical aspects;

For serving as a role model among young scientists in support of scientific and technological researches and for providing strong support to his colleagues and peers regarding important researches;

For his distinguished achievements and contributions in science, in which the country takes pride, and pursuant to Proclamation No 782, dated June 6, 2014.

have caused to be inscribed in the roster of the

Order of National Scientist

the name of

Angel Chua Alcala, Ph.D.

*Done in the City of Manila
this 12th day of August
in the year of Our Lord Two Thousand and Fourteen*