

## Obituary

### Peter Eric Holloway (1953–2002)

The Australian marine research community has been shocked and saddened by the sudden death of Peter Holloway in October 2002. Peter was a prominent member of the community: respected for his opinions, a productive researcher and a fine teacher. From 1997, he was on the Editorial Advisory Committee for this journal.

At the time of his death, Peter was in his first term as Head of the School of Geography and Oceanography at the Australian Defence Force Academy, a college of the University of New South Wales. He had been a member of the School since 1986, when he was recruited to establish its undergraduate teaching program in physical oceanography. Over the following few years, he built up one of the largest teaching and research units in physical oceanography in Australia, closely aligned with the School of Mathematics at the University.

Peter himself was a graduate of The Flinders University of South Australia, where he completed his PhD in 1979 under the supervision of Professor Gunther Krause. His PhD, on meteorological forcing of stratification and mixing, set the scene for a number of recurrent themes in his life: his skills as a theoretician, his need to work with real data and his ability as a field researcher. He did his fieldwork in the Coorong, a picturesque coastal lagoon system, which fitted comfortably with his love of the natural environment. He also established, with Gunther, a long-term friendship and international collaboration leading, among other things, to Peter's participation on an *R/V Polarstern* cruise to the Arctic in 1990.

After Flinders, Peter took postdoctoral fellowships at Dalhousie University in Canada for a year, working with Professor Chris Garrett, and then, in late 1980, in the Department of Civil Engineering at the University of Western Australia. At Dalhousie, Peter worked on mixing under the very large surface tides in the Bay of Fundy. In Western Australia, tides also captured his imagination, this time the spectacular internal tides that were being observed by Woodside Petroleum on the North West Shelf of Australia. These are some of the biggest tidal events in the world, typified by isotherm jumps of 50 metres through the vertical in just a few minutes. Internal tides became Peter's research passion.

Through the 1980s, he spent much of his time poring over the remarkable temperature and current records that Woodside was collecting, as he developed and applied analysis techniques to describe the properties of the internal waves. In the late 1980s, he launched (bravely!) into a study of the nonlinear behaviour of the waves: why was the temperature signal square, rather than nicely sinusoidal, and what was the mechanism that caused the steep wavefront to break down into a sequence of isolated waves (solitons)? In this work, he formed an enduring and fruitful collaboration



with Efim Pelinosvsky and Tatyana Talipova from the Institute of Applied Physics in Nizhny Novgorod, Russia. They visited him in Canberra several times and he went to Russia as a visiting scholar in 1993.

In the mid-1990s, Peter moved into more conventional modelling, by pushing the public-domain Princeton Ocean Model (POM; the hydrodynamic model probably most widely used in coastal applications) to simulate the internal tides of the North West Shelf. Despite the strongly stratified and nonlinear environment that, to my mind, was a real challenge for the POM, Peter coaxed highly credible results from the model. He was able to achieve an elusive goal of internal tidal modelling, to demonstrate and quantify the sensitivity of the tides to the 3-dimensional structure of the bathymetry.

Peter's expertise with modelling and 3-dimensional dynamics took him as a principal investigator into the multi-institutional, National Science Foundation-funded, Hawaiian Ocean Mixing Experiment (HOME). Here, he was working particularly with Mark Merrifield of the University of Hawaii on describing the internal tides generated by the deep Hawaiian Ridge. Their ultimate aim was to estimate the

contribution of internal tides to mixing and the dissipation of energy in the deep ocean – again, a connection back to Peter's PhD work. There is a Holloway and Merrifield paper appearing in the *Journal of Geophysical Research* as I write and they are coauthors of a paper about to appear in *Science*.

Peter's long hours at the light-table with time-series from the North West Shelf inevitably led him to other phenomena. He collaborated in a number of studies of tropical cyclone dynamics, and also led a landmark study on the supply of nutrients to the shelf. The shelf is also a source-region for the warm Leeuwin Current that flows southward down the Western Australian coast, and Peter demonstrated the dependency of the current strength on the winds over the region.

Canberra, 150 km inland and 600 m above sea level, is not an oceanographer's idyll. From the start of his time at the Defence Force Academy, Peter organized annual field trips to the coast for his students. Their destination was Jervis Bay, another picturesque coastal environment, which became a secondary geographic focus for his research. Like internal waves, the dynamics of Jervis Bay proved to be perverse, often driven by remote influences such as coastally trapped waves and the East Australia Current.

Peter was obviously held in high regard by the oil and gas industry, which provided him with data, and turned to him for advice on structural design issues. He was also widely respected for his broad perspective, his rational approach, and his wise counsel on oceanographic issues. He served on the Australian Academy of Sciences National Committee for Ocean Sciences from 1991 to 1996, and then their National Committee for Atmospheric and Ocean Sciences from 1997 until his death. He was on the Australian Antarctic Division's Advisory Committee for Oceanography from 1996 to 2000, and worked on review panels for the Cooperative Research Centre for Antarctica and the Southern Ocean and the Federal Government's Major National Research Facilities Program. He was also inaugural secretary of the Physical Oceanography Division of the Australian Marine Sciences Association from 1985–1989, and then its president from 1990 to 1993.

At a personal level, Peter was an absolute pleasure to work and interact with. He was a patient listener and an insightful commentator. He was persistent, meticulous and open in his

approach to his research. He had a fine, gentle sense of humour, and an unflinching sense of honour and integrity. For me, it was always a delight to spend a day working with him, and then to share a drift into more expansive mode over a glass beer or (South Australian!) wine.

I have mentioned his love of the outdoors. Aside from the opportunities his research offered, he was a keen bushwalker as a younger man, and fuelled a serious infatuation with skiing during his postdoc in Canada. He was also an enthusiastic tennis player.

There is one thread from Peter's PhD that I have not yet mentioned. During his PhD, Peter met his future wife, Marilyn (Mandy), who was working in the same department. They were together through this journey of Peter's that I have described and, at the time of his death, were working to revitalize both the interior and garden of an old farmhouse outside Canberra. Peter was a more than competent woodworker and cabinetmaker.

Peter's untimely death is a serious loss to the marine community. His publishing career was in full charge as he added layers to his understanding of oceanography, and particularly of internal tides. He has left an extensive legacy of published work, but his contribution has been cut short, his full promise unattained. He is also no longer there to contribute to the higher-level deliberation and decision-making on marine science in Australia. Many of us have lost not only a colleague, but also a true friend, whose company was valued far beyond the bounds of professional interaction.

For his family, the loss is devastating. Peter was a devoted family man. I observed him as a rock on which a family could build, and from which they could look toward the future. Peter lived for long enough to meet his first grandson. The deep sympathy of his colleagues has been extended, and continues to be, to his wife, two sons and daughter, and also to his daughter-in-law and grandson. Peter is also survived by his parents and four sisters.

Peter Craig

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