

Media Release

Chiefs of Staff, News Directors

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New theory to explain major mass extinctions

Selenium, a little known element, plays a starring role in a new theory that explains three of the five major mass extinctions over the last 600 million years.

A collaborative team including University of Tasmania geologists and Flinders University palaeontologists in South Australia, with a group of international researchers, have revealed the critical role of selenium in the cycle of life and death in the oceans over the last 600 million years. Their work was published in the current issue of the journal *Gondwana Research*.

Distinguished Professor Ross Large, who leads the Tasmanian research team, said that selenium is a unique trace element in our environment.

“Too much is toxic for life and too little retards life, and so selenium has a narrow window of opportunity where life can flourish,” Professor Large said.

“Levels of selenium become low when there is little movement in the earth's continents. It is a rare trace element, so without an active supply it can become dormant in the sediment on the ocean floor. Without it, things begin to die and life cannot flourish again until the continental plates collide, releasing selenium back into the oceans.”

Researchers at the University of Tasmania used laser analytical techniques to measure selenium concentrations in marine pyrite, which has grown on the ocean floors over the last 600 million years. This enabled them to track selenium concentrations in the oceans over this long period of ocean history.

The remarkable result is that selenium has been abundant for some periods of ocean history, but has been in very low concentrations for other periods; so low that life in the oceans was threatened and in the few extreme cases, 450 million years ago, 370 million years ago and 201 million years ago, became extinct.

Professor John Long, from Flinders University worked with the University of Tasmania team, who together have demonstrated the connection between Earth geological evolution and ocean biological evolution to confirm the importance of

selenium in the life cycle, and the dramatic effects of selenium concentration upon evolution and mass extinction.

For more information, including a video interview with Professor Ross Large, visit the University of Tasmania's [Research to Reality](#) page.