

# Sea levels are rising faster than they have in 2,800 years

Since 1993 the rate has soared to 30 centimetres (a foot) per century, up from 3 to 4 centimetres

The Associated Press | Posted: Feb 22, 2016 4:31 PM ET | Last Updated: Feb 22, 2016 4:31 PM ET



A motorist drives through the brackish sea water that seeps low lying areas in Charleston, S.C. Nuisance flooding, which is from ordinary high tides exacerbated by sea level rise and accompanying land subsidence, is increasing in part due to sea level rise from man-made climate change. (Stephen B. Morton/Associated Press)

# IGCP Global Change: Evidence from the Geologic Record

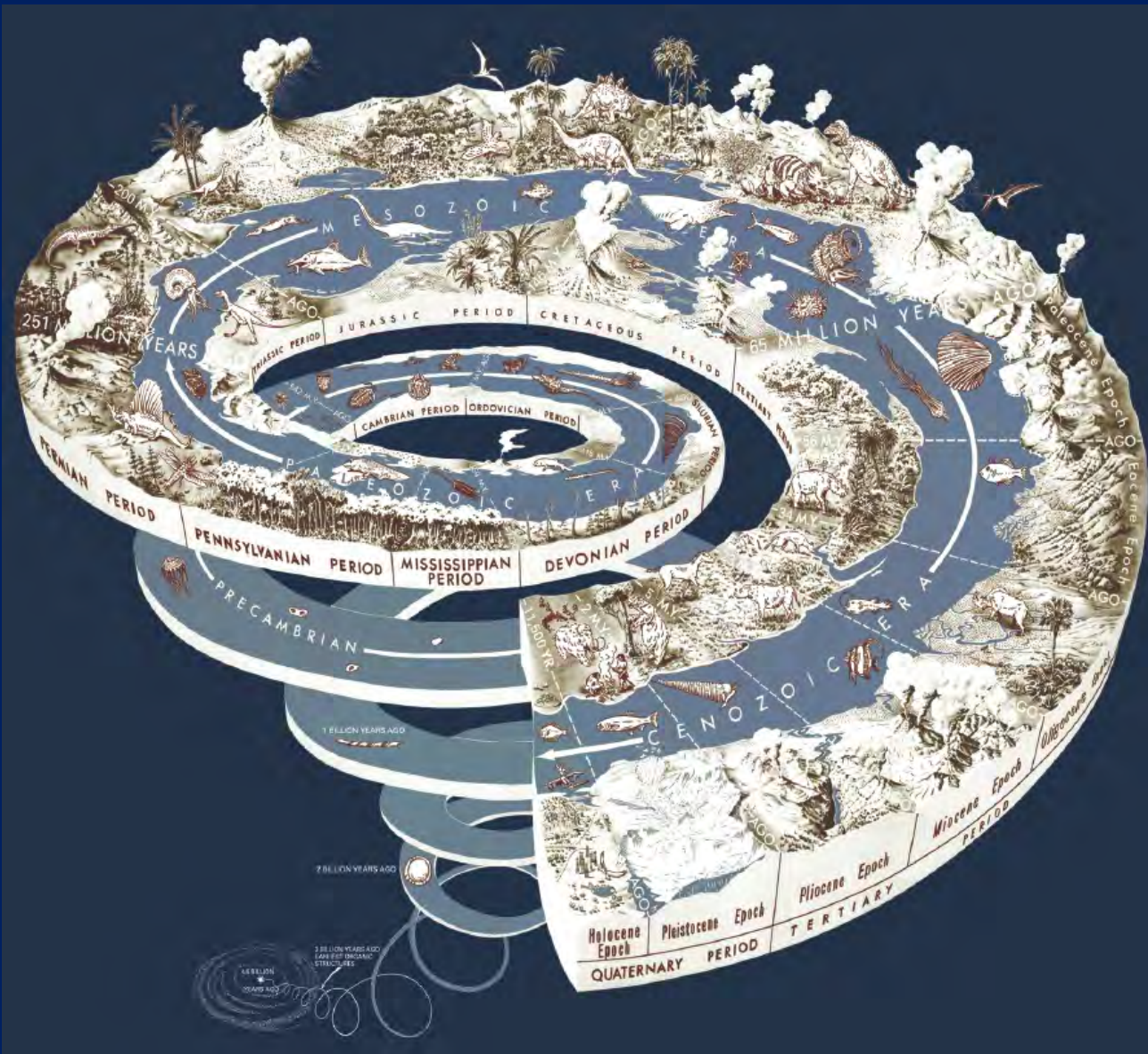


**Sedimentary rocks contain the record of global change over periods ranging up to billions of years**

# IGCP Global Change: Evidence from the Geologic Record

The inter-relationship between global change and life in deep time

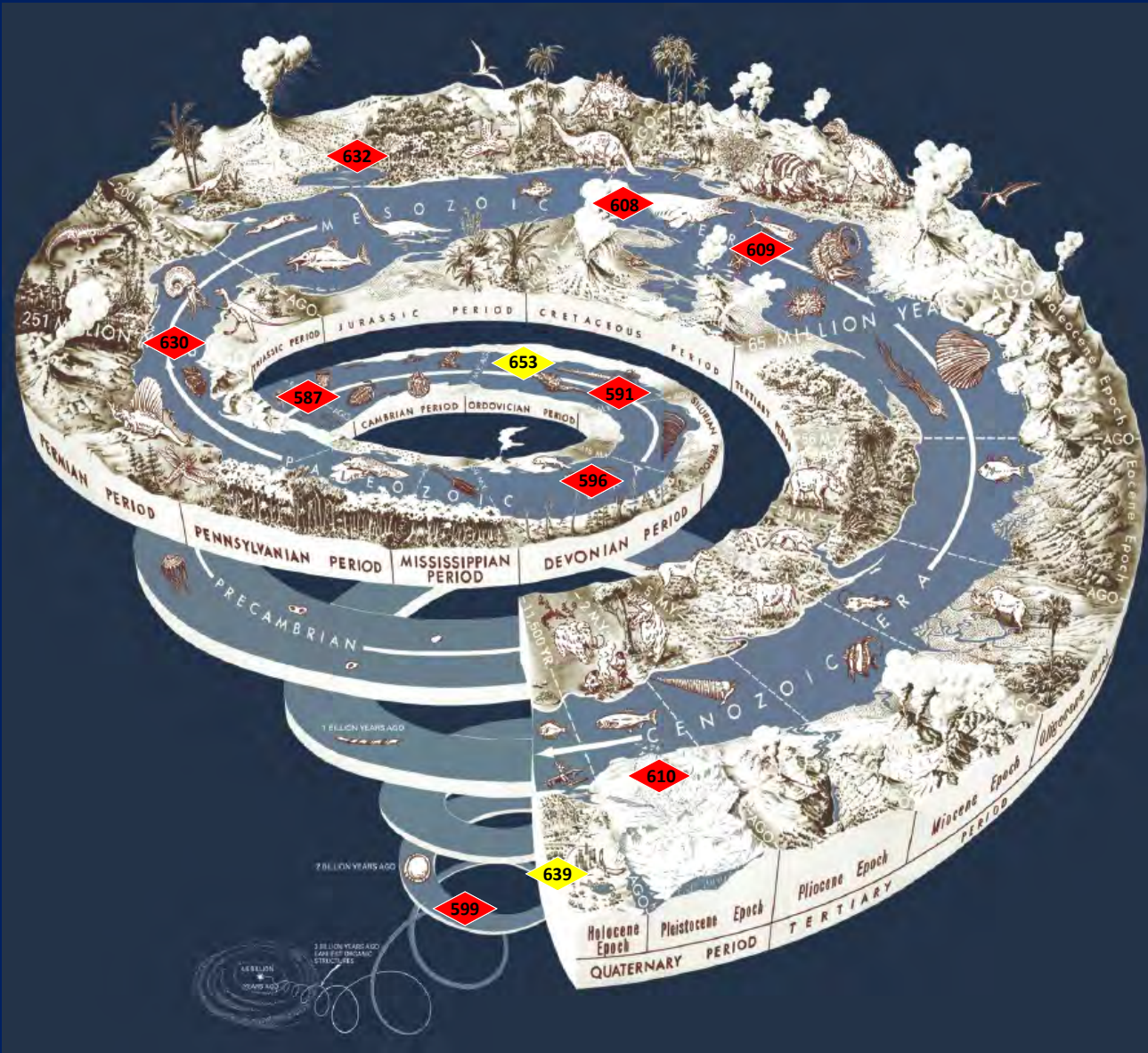
- The fundamental underpinning of the evolution of the Earth, the history of life, and the Geologic Time Scale
- Provides geological insights into the effects of present and future global change on the Earth and life



## IGCP Global Change Projects:

- IGCP 639 – Sea Level Changes from Minutes to Millennia
- IGCP 610 – Caspian to the Mediterranean
- IGCP 609 – Cretaceous Sea Level Changes
- IGCP 610 – Asia-Pacific Cretaceous Ecosystems
- IGCP 632 – Continental Crises of the Jurassic
- IGCP 630 – Permian-Triassic Climatic Extremes and Life
- IGCP 596 – Mid-Paleozoic Climate and Biodiversity
- IGCP 591 – Early- to Mid-Paleozoic Revolution
- IGCP 609 – Cretaceous Sea Level Changes
- IGCP 653 – Great Ordovician Biodiversification Event
- IGCP 587 – The Ediacaran (Vendian) Puzzle
- IGCP 599 – The Changing Early Earth (Archean)

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# IGCP 587 – The Ediacaran (Vendian) Puzzle



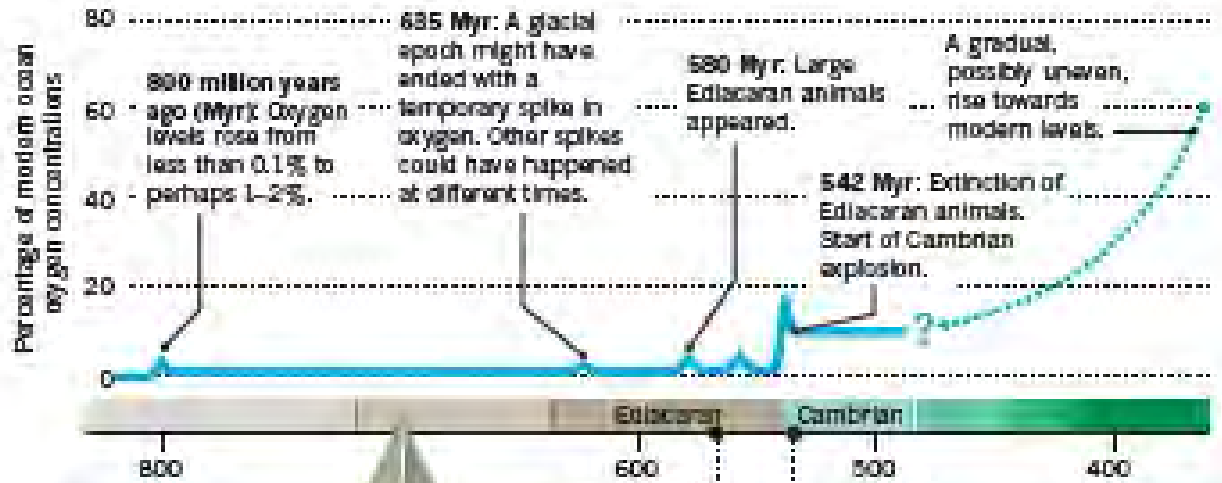
JOHN SECKENTHAL, HISTORYMUSEUM

## WHAT SPARKED THE CAMBRIAN EXPLOSION?

An evolutionary burst 540 million years ago filled the seas with an astonishing diversity of animals. The trigger for that revolution is finally coming into focus.

NEWS FEATURE

Big animals emerged during the Ediacaran period, but these creatures were slow or immobile. A rise in oceanic oxygen concentrations at the end of the period might have helped to trigger the Cambrian evolutionary explosion.



**Ediacaran organisms**

- Dickinsonia**
  - Could grow to more than 1 metre
- Charlesites**
  - May have been a filter-feeding animal

The Ediacaran animals were relatively simple and lacked evidence of legs, eyes and many other anatomical innovations

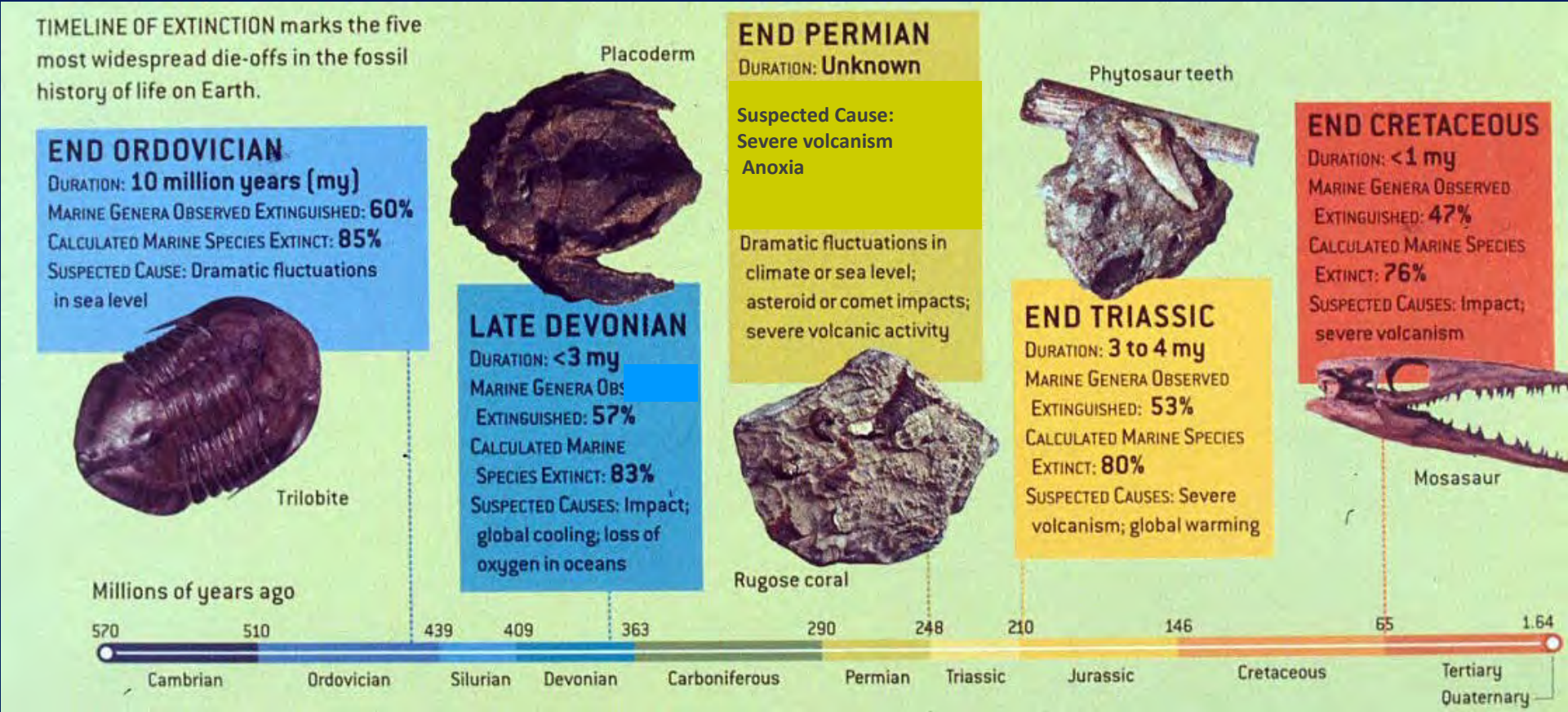
**Cambrian organisms**

- Anomalocaris**
  - Predator with eyes and circular jaws
- Pikaia**
  - Had a notochord, which is a stiff, internal rod
- Marrella**
  - Small arthropod with leathery gills

The Cambrian explosion produced many of the animal types common today, such as arthropods (*Marrella* and the *Anomalocaris*) and chordates (*Pikaia*), a group that now includes vertebrates.

Animals appeared suddenly during a rise in free oxygen 600 million years ago

# IGCP 630 – Permian-Triassic Climatic Extremes and Life

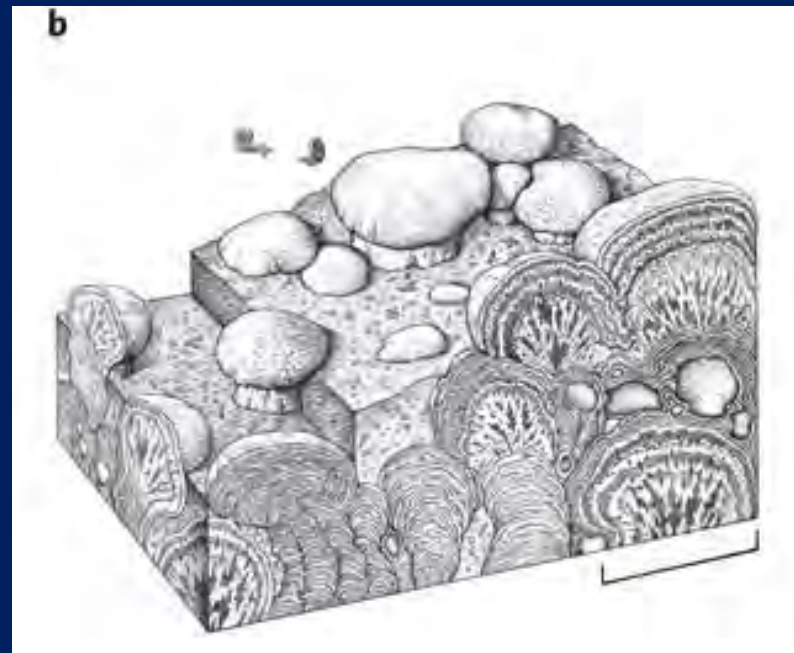
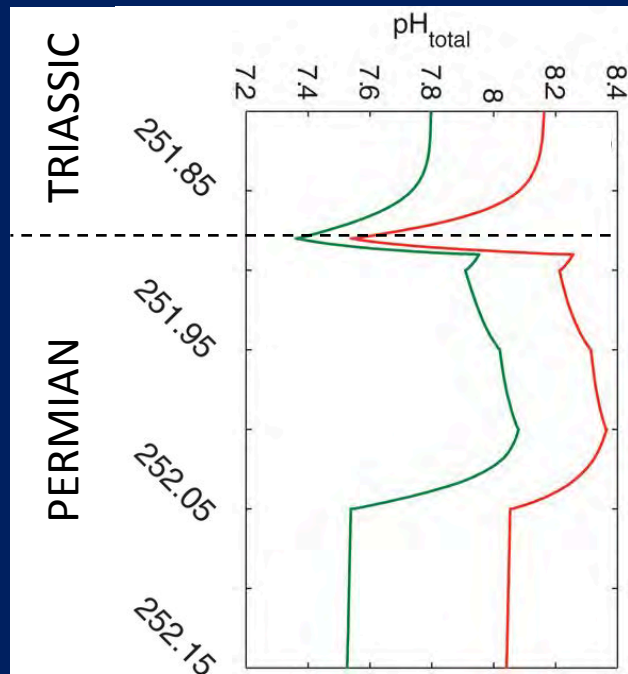


## MASS EXTINCTIONS: THE BIG FIVE

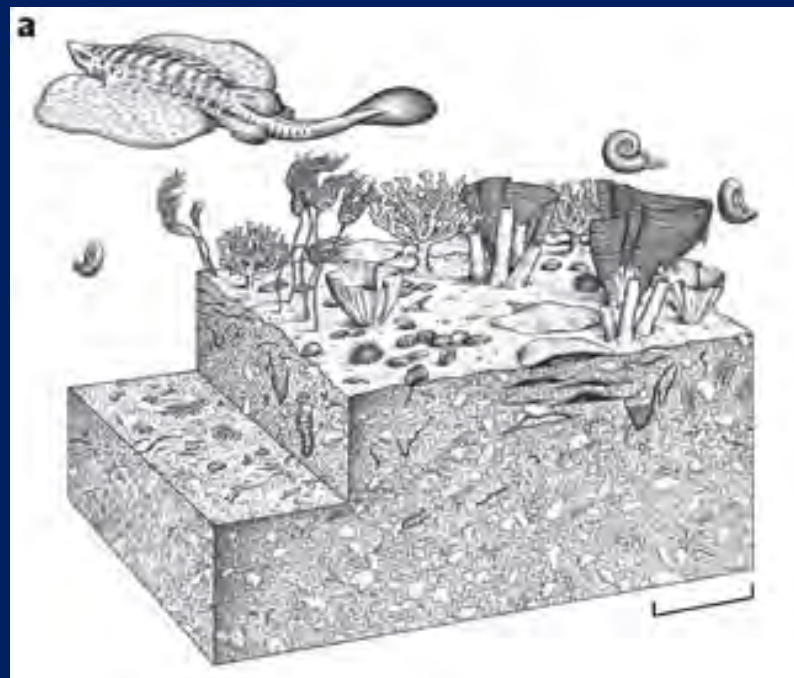
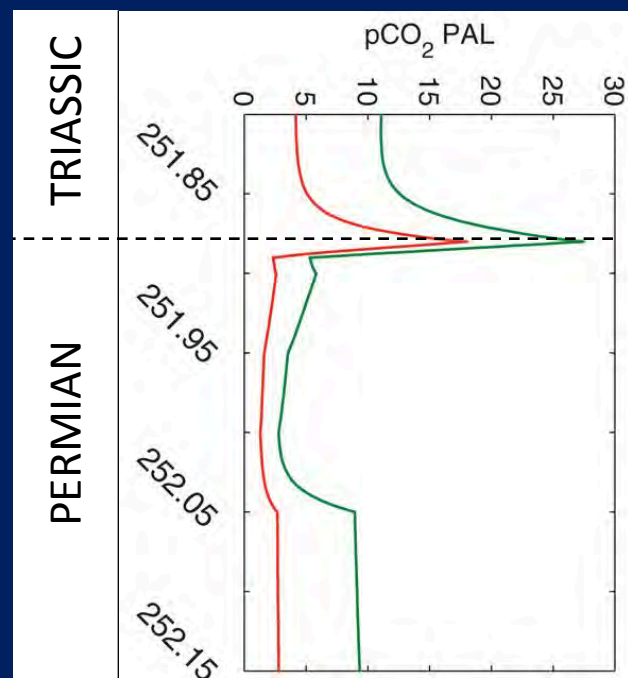
Meishan Section,  
China



Global Stratotype for the Permian – Triassic  
Boundary



**Earliest Triassic  
“Disaster Biota”**



**Latest Permian  
Diverse Marine Ecosystem**



# IGCP 630 – Permian-Triassic Climatic Extremes and Life

**Total of 346 scientists from 33 countries participate in IGCP 630:**

Argentina, Armenia, Australia, Austria, Bangladesh, Burma, Canada, China, Croatia, Czech Republic, Denmark, France, Germany, Hungary, India, \*Iran, Israel, Italy, Japan, Madagascar, Malaysia, New Zealand, Norway, Poland, Romania, Russia, Slovenia, Spain, Switzerland, Thailand, Turkey, United Kingdom, United States of America

**Of these:**

- 160 are young scientists/students (<35 years old)
- 130 are from developing countries

External research funding for leaders and participants of IGCP 630 exceeds \$13M USD

Exceptional scientific output and public outreach!

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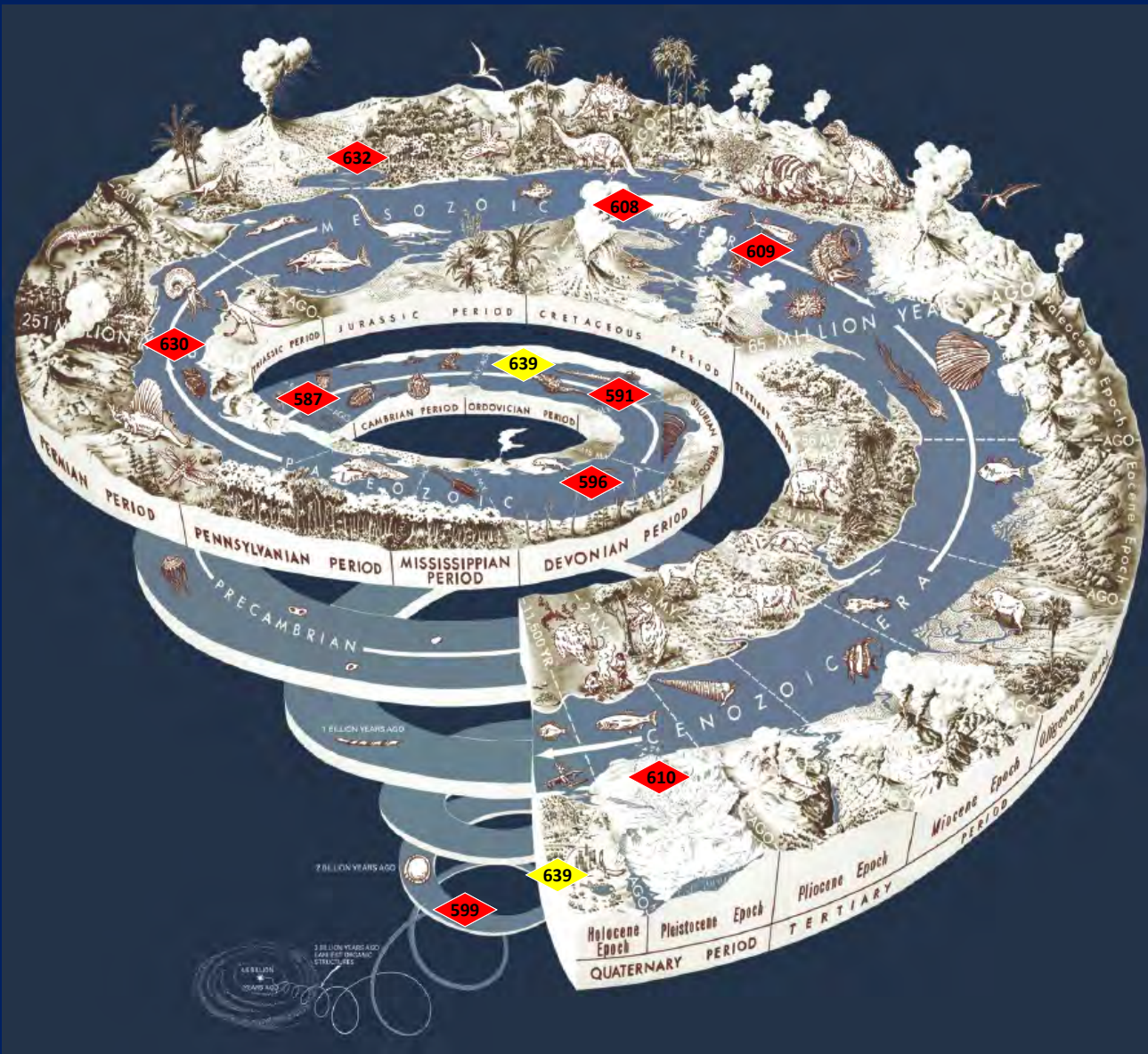
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**TRANSFORMING OUR WORLD:**



**THE 2030 AGENDA FOR  
SUSTAINABLE DEVELOPMENT**

Goal 13. Take urgent action to combat climate change and its impacts\*

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