Liste erstellt am 2014-01-12

Literatur

2014-01-22 U/Th

Eisenhauer 1993

A. Eisenhauer, G. J. Wasserburg, J. H. Chen, G. Bonani, L. B. Collins, Z. R. Zhu & K. H. Wyrwoll, *Holocene sea-level determination relative to the Australian continent, U/Th (TIMS) and ^{14}C (AMS) dating of coral cores from the Abrolhos Islands.* Earth and Planetary Science Letters **114** (1993), 529–547.

U/Th (TIMS) and 14C (AMS) measurements are presented from two coral cores from the Easter group of the Houtman Abrolhos Islands between 28°S and 29°S on the western continental margin of Australia. The U/Th measurements on the Morley core from Morley Island cover a depth interval from 0.2 m above present sea level to 24.4 m below present sea level and comprise eleven samples. The ages vary between 6320 ± 50 a, at 0.2 m above sea level, and 9809 ± 95 a, at 24.4 m below sea level (all errors are $2sigma$). The mean growth rate is 7.1 ± 0.9 m/ka. The 14C dates of selected Morley core corals show that the 14C ages are ≈ 1000 a younger than their corresponding U/Th ages, which agrees with previous results. The main purpose of our 14C measurements is to be able to compare them precisely with other coral cores where no U/Th measurements are available. The U/Th measurements of the Suomi core from Suomi Island cover a depth interval from 0.05 m to 14.2 m below present sea level and consist of four samples. The ages vary between 4671 ± 40 a, at 0.05 m below sea level, and 7102 ± 82 a, at 14.2 m below sea level, with a mean growth rate of 5.8 ± 0.2 m/ka. The growth history of both cores is explained by a simple model in which the growth rates of the Morley core can be interpreted as reflecting local rates of sea level rise, whereas the Suomi core is interpreted as reflecting lateral growth during the past ≈ 6000 a.
Our results indicate that sea level relative to the western margins of the Australian continent was about 24 m lower than present at about 9800 a B.P. (14C gives a date of 8500 a B.P.). Sea level then rose and reached a highstand, slightly higher than the present position at about 6300 a B.P (14C date: 5500 a). This highstand declined but was still higher than present at 4600 a B.P. This is in agreement with previous observations along the Australian coastal margins and with observations from the Huon peninsula (Papua New Guinea). Our results are very similar to theoretical numerical models, which take into consideration water loading and isostatic compensation an0 viscous mantle flow. In contrast, coral cores from Barbados show that corals with a 14C age of ≈ 5500 a B.P. are some ≈ 10 m b.p.s.l. We interpret the difference between the Barbados core and the Morley core as resulting from additional "flooding" of Barbados by water redistribution, due to changes in the Earth's geoid but not reflecting global sea level rise or major addition of melt waters over the past ≈ 6000 a. The difference in the geoid at Barbados between ≈ 6000 a B.P. and the present will require a refinement in the geophysical models. Precise 230Th (TIMS) measurements on continental coasts will be required to provide an adequate data base for modelling deformation, flow of mantle material and sea-level height.

Geyh 2005

Mebus A. Geyh, *Handbuch der physikalischen und chemischen Alters-*

bestimmung. (Darmstadt 2005).

Geyh 2008
Mebus A. Geyh, *^{230}Th/U-dating of interglacial and interstadial fen peat and lignite: Potential and limits*. Eiszeitalter & Gegenwart **57** (2008), 77–94.

Hellstrom 2012
John Hellstrom, *Absolute Dating of Cave Art*. science **336** (2012), 1387–1388.
Use of uranium-thorium dating shows that cave art in Spain is older than expected.

Nuklidkarte 1998
G. Pfennig, H. Klewe-Nebenius & W. Seelmann-Eggebert, *Karlsruher Nuklidkarte*. (Karlsruhe ^{6}1998).

Periodensystem 2002
Ekkehard Fluck & Klaus G. Heumann, *Periodensystem der Elemente*. (Weinheim ^{3}2002).

Pike 2012
Alistair W. G. Pike, *U-Series Dating of Paleolithic Art in 11 Caves in Spain*. science **336** (2012), 1409–1413.
s336-1409-Supplement.pdf
A. W. G. Pike, D. L. Hoffmann, M. García-Diez, P. B. Pettitt, J. Alcolea, R. De Balbín, C. González-Sainz, C. de las Heras, J. A. Lasheras, R. Montes, J. Zilhão
Paleolithic cave art is an exceptional archive of early human symbolic behavior, but because obtaining reliable dates has been difficult, its chronology is still poorly understood after more than a century of study. We present uranium-series disequilibrium dates of calcite deposits overlying or underlying art found in 11 caves, including the United Nations Educational, Scientific, and Cultural Organization (UNESCO) World Heritage sites of Altamira, El Castillo, and Tito Bustillo, Spain. The results demonstrate that the tradition of decorating caves extends back at least to the Early Aurignacian period, with minimum ages of 40.8 thousand years for a red disk, 37.3 thousand years for a hand stencil, and 35.6 thousand years for a claviform-like symbol. These minimum ages reveal either that cave art was a part of the cultural repertoire of the first anatomically modern humans in Europe or that perhaps Neandertals also engaged in painting caves.

Shen 2013
Chuan-Chou Shen, Ke Lin, Wuhui Duan, Xiuyang Jiang, Judson W. Partin, R. Lawrence Edwards, Hai Cheng & Ming Tan, *Testing the annual nature of speleothem banding*. Scientific Reports **3** (2013), 2633. DOI:10.1038/srep02633.
SciRep03-02633-Supplement1.pdf
Speleothem laminae have been postulated to form annually, and this lamina-chronology is widely applied to high-resolution modern and past climate reconstructions. However, this argument has not been directly supported by high resolution dating methods. Here we present contemporary single-lamina 230Th dating techniques with 2s precision as good as 60.5 yr on a laminated stalagmite with

density couplets from Xianren Cave, China, that covers the last 300 years. We find that the layers do not always deposit annually. Annual bands can be under- or over-counted by several years during different multi-decadal intervals. The irregular formation of missing and false bands in this example indicates that the assumption of annual speleothem laminae in a climate reconstruction should be approached carefully without a robust absolute-dated chronology.

Wagner 1998
Wagner, *Age determination of young rocks and artifacts*, *Physical and chemical clocks in Quaternary geology and archaeology.* (Berlin 1998).

Walker 2005
Mike Walker, *Quaternary Dating Methods.* (Chichester 2005).