

## Explanatory Notes System Geochronology subsection

In the Explanatory Notes System (ENS) Geochronology subsection for lithostratigraphic units, ages are entered as Inferred, Isotopic, Biostratigraphic, or Paleomagnetic.

**Inferred** ages are used if the unit has not been directly dated. It may be constrained in age by other units or events, sometimes quite closely, or the age may be a very broad estimate, even a considered guess. **Isotopic** (or paleomagnetic or biostratigraphic) ages are used when a specific unit has been directly dated.

For lithostratigraphic parent/child units, the following applies:

- If a child unit (formation, group, member, etc.) is isotopically dated, the maximum and minimum ages of the parent unit remain inferred.
- If the dated child unit is demonstrably at the base or top of the parent unit, the corresponding maximum or minimum age for the parent unit is isotopic.
- If a child unit or general parent unit is isotopically dated at a specific locality, then an isotopic age can be shown on the map for that unit, but not elsewhere, as long as ENS has a note of the specific age and the specific area in the Geochronology Discussion area. Editors should scan the Geochronology text to confirm this, if an isotopic age has been used for a unit whose age is otherwise inferred in ENS.

Note that the age range of a unit must be, at most, equal to the age range of any of its parent units. For example, an Aptian formation cannot have a Lower Cretaceous child unit. Built-in checks in ENS prevent units from having ages inconsistent with those of their parent or child units.

Isotopic or paleomagnetic dates must have the uncertainty entered (also built into ENS), and be directly related to the unit in question. When defining maximum and minimum age constraints for a unit with isotopic or paleomagnetic dates, use the quoted age — not the age plus or minus the uncertainty. The quoted value is the best estimate of the age, as a date corresponding to the limit of the uncertainty has a much lower probability of being correct. Note that uncertainties for maximum and minimum ages can overlap.

A reference is mandatory for isotopic and paleomagnetic ages. Should a Geochronology Record not be available at the time of publication of the ENS unit, the unit must be assigned an inferred age, and geochronology results should be quoted in the text as 'GSWA preliminary data'. It is the responsibility of the authors to update their units once a Geochronology Record is published, to ensure consistency between table and text. Below are the approved formats for citing unpublished and published Geochronology Records in ENS — note that the GSWA sample number is always quoted:

(GSWA 123456, GSWA preliminary data)

(GSWA 123456, Wingate et al., 2013; GSWA 678901, Kirkland et al., 2013)

(GSWA 142852, Nelson, 1998b; Sheppard and Swager, 1999)

Where an age is biostratigraphic, a numerical age is generally automatically populated from a look-up table based on the latest accepted [IUGS Chronostratigraphic chart](#).