Comparing records with related chronologies

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In order to integrate ice, terrestrial and marine records, it is necessary to deal with records on different timescales. These timescales can be grouped into those that use a common fundamental chronometer (such as Uranium-Thorium dating or Radiocarbon) and can also be related to one another where we have chronological tie points such as tephra horizons. More generally we can, through a number of different methodologies, derive relationships between different timescales. A good example of this is the use of cosmogenic isotope production, specifically ^{10}Be and ^{14}C to relate the calibrated radiocarbon timescale to that of the Greenland ice cores.

The relationships between different timescales can be mathematically expressed in terms of time-transfer functions. This formalism allows any related record to be considered against any linked timescale with an appropriate associated uncertainty. The prototype INTIMATE chronological database allows records to be viewed and compared in this way and this is now being further developed, both to include a wider range of records and also to provide better connectivity to other databases and chronological tools. These developments will also include new ways to use tephra tie-points to constrain the relationship between timescales directly, without needing to remodel each associated timescale.

The database as it stands allows data for particular timeframes to be recalled and plotted against any timescale, or exported in spreadsheet format. New functionality will be added to allow users to work with their own data in a private space and then to publish it when it has been through the peer-review publication process. In order to make the data easier to use for other further analysis and plotting, and with data from other sources, the database will also act as a server to deliver data in a JSON format. The aim of this work is to make the comparison of integrated data much easier for researchers and to ensure that good practice in qualifying chronological uncertainty in record comparison is much more widespread.