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All age–depth models are wrong, but are getting better

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Construction of accurate age-depth relationships and realistic assessment of their uncertainties is one of the fundamental prerequisites for comparing and correlating Late Quaternary stratigraphic proxy records. Four widely used age-depth modelling routines: i) clam, ii) OxCal, iii) Bacon, and iv) Bchron were tested using radiocarbon dates simulated from varved sediment stratigraphies. All methods produced average age-depth models that were close to the true varve age, but the uncertainty estimation differed considerably among models. Age uncertainties were underestimated by clam, whereas age uncertainties produced by Bchron were too large. Using OxCal and Bacon, setting of model specific parameters influenced the estimated uncertainties, which varied from too large to too small. Still, compared to the study by Telford et al. (2004), the use of Bayesian age-depth models greatly improved on the assessment of uncertainties of age-depth models.

Reference:
Telford et al. (2004), All age–depth models are wrong: but how badly? Quaternary Science Reviews, 23,1-5.