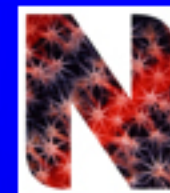


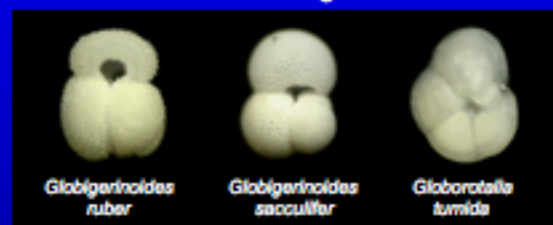
# Testing the effect of taxonomic bias on estimating Pleistocene – Recent sea surface temperatures using planktonic foraminifera

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Error in taxonomic identifications can be reduced substantially by employing automated methods of object identification, but only if the automated methods themselves can recognize differences between complex morphologies. This project used neural net and morphometric approaches to evaluate the reliability of taxonomic identifications for recent foraminifera used to estimate paleoceanographic sea-surface temperatures (SSTs).

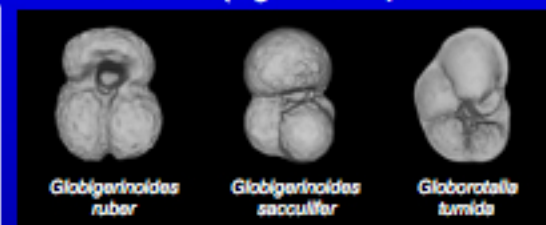
Raw Images



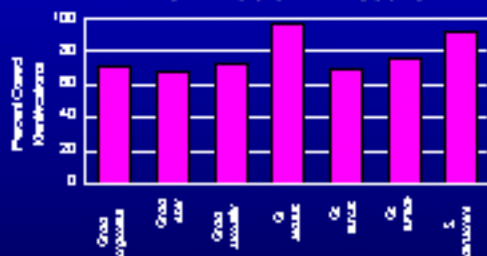
DAISY Images



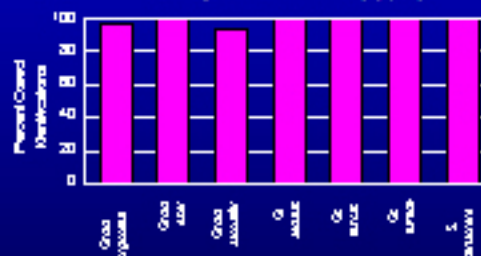
3D Virtual (Eigensurface) Models



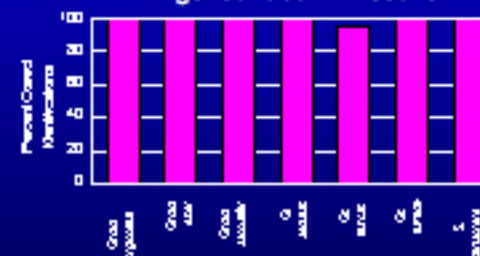
Form Factor ID Results



DAISY ANN ID Results



Eigensurface ID Results



The project has created two automated identification systems that both perform foraminiferal identifications more accurately, more consistently, and more quickly than human experts. As shown for a small example dataset above, both DAISY neural net and eigensurface-based software produce much more consistent identifications of a multi-expert validated training set than traditional form factor-based methods which, in term, produce more consistent results than individual human experts. At present, an independent panel of multiple taxonomic experts is reaching a consensus on taxonomic identifications for a 3,000 specimen, 30 species training set. Once these identifications are available a DAISY-based automated identification system will be complete and able to be released to the systematics community. Preliminary results suggest the effect of taxonomic bias on SST estimation is substantial.