Geophysical Research Abstracts,
Vol. 10, EGU2008-A-12337, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-12337
EGU General Assembly 2008

Qualitative moisture and temperature trend assessment using same-core ostracode and pollen records, Illinois, United States

B. Brandon Curry
Illinois State Geological Survey, Champaign, Illinois, U.S.A. (curry@isgs.uiuc.edu)

I have tested the basic tenet that pollen records from lake cores reflect past climate by comparing these records with same-core ostracode profiles from Illinois, U.S.A. Based on time scales and record resolution ranging from about 10^2 to 10^4 yr offered by the cores, multivariate relationships confirm the control of regional climate (reflected by pollen spectra) on lake moisture balance with no discernable time lag. These results are consistent with modern lake water residence times of < 1 yr at two sites in northeastern Illinois (Nelson and Crystal Lakes). Interpreting ostracode records may be done in a number of ways, including in-lake studies fauna depth relationships, biogeochemistry (Sr/Ca is especially useful for interpreting paleosalinity), habitat preferences, or modern analogs.

Three last interglacial pollen and ostracode records from three kettle basins in southern Illinois (Raymond Basin, Pittsburg Basin, Bald Knob Basin) span from about 130,000 to about 40,000 yr B.P. In general, benthic ostracode species are associated with tree pollen, and nektic species with non-arboreal pollen. Specifically, *Cytherissa lacustris* and *Limnocythere friabilis* co-occur with *Picea* and *Pinus*; *Fabaeformiscandona caudata* with *Quercus*, *Carya*, and *Liquidambar*; *Cypridopsis vidua* and *Potamocypris smaragdina* with *Ambrosia* or Chenopodiacea-type pollen, and lentic and hypogean species (*Limnocythere reticulata*, *Pelocypris tuberculatum*) with non-analog pollen assemblages (*Picea*, *Liquidambar*, Chenopodiacea).

In northeastern Illinois, four kettle basin lake records from the last glacial-interglacial transition (Oldest Dryas to Early Holocene) are being investigated. These records have

an advantage over the older records discussed above because in most cases, the lake has persisted through modern times. Crystal Lake (McHenry County) has received the most scrutiny. Species/water depth relationships in the modern lake have been quantified. The most interesting and applicable result is the dominance of the planktonic/nektonic species *Physocypria globula* and *Cypria ophthalmica* in waters from 7-13 m depth that undergo summer anoxia (13 m = maximum lake depth). This assemblage is common in samples dating from the Allerod, Younger Dryas, and Early Holocene. The results compliment the qualitative interpretation of wet conditions from the dominance of *Picea* and *Fraxinus nigra*-type pollen and near total exclusion of *Ambrosia* and *Artemesia*. Hence, unlike the North Atlantic seaboard, central North America did not experience dry conditions during the Younger Dryas. Work is underway to quantify paleoenvironmental parameters through the two-pronged approach of valve biogeochemistry and modern analogs.