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Collaborative Research: Long Records of Paleoclimate from Florida

George L. Jacobson
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Co-Principal Investigator; University of Maine, Orono

Final Report for Period: 09/1994 - 02/1999
Submitted on: 06/08/1999
Principal Investigator: Jacobson, George L.
Award ID: 9321265
Organization: University of Maine
Submitted By:

Title:
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Project Participants

Senior Personnel

Name: Jacobson, George
Worked for more than 160 Hours: Yes
Contribution to Project:

Name: Almquist-Jacobson, Heather
Worked for more than 160 Hours: Yes
Contribution to Project:

Name: Hansen, Barbara
Worked for more than 160 Hours: Yes
Contribution to Project:
Barbara contributed her expertise in palynology to help develop the pollen strigraphies that were part of the research project.

Post-doc

Graduate Student

Name: Dieffenbacher-Krall, Ann
Worked for more than 160 Hours: Yes
Contribution to Project:
Ann worked on many of the laboratory and fieldwork aspects of the project, and completed a Ph.D. dissertation that advances the science of paleohydrology.

Undergraduate Student

Technician, Programmer

Other Participant

Research Experience for Undergraduates

Organizational Partners

Illinois State Museum Society
This was a collaborative proposal with Dr. Eric C. Grimm, of the Quaternary Research section of the Museum staff. We collaborated in fieldwork, analysis, and now in publications.

Other Collaborators or Contacts

Activities and Findings

Research and Education Activities: (See PDF version submitted by PI at the end of the report)

Findings: (See PDF version submitted by PI at the end of the report)

Training and Development:
All involved have learned from the experience, as with all good research projects. One Ph.D. student developed her current high-level of expertise while participating in the project, and several undergraduate work-study students have developed a variety of skills associated with our laboratory procedures.

Outreach Activities:

Journal Publications

Dieffenbacher-Krall, A.C., "The relationship of modern plant macrofossils to water depth", Journal of Paleolimnology, p. , vol. , ( ). Accepted,

Dieffenbacher-Krall, A.C., G.L. Jacobson Jr., and P.J.H. Richard, "Responses of aquatic vascular plants to post-glacial climate change: a test of the Iversen hypothesis", Geographie Physique et Quaternaire, p. , vol. , ( ). Submitted,

Hansen, B.C.S., E.C. Grimm, and W.A. Watts, "Evidence of late-Tertiary climate oscillations in Florida: Evidence from Peace Creek (Polk Co.) sinkhole deposits.", Bulletin of the Geological Society of America, p. , vol. , ( ). Submitted,

Grimm,E.C., G.L. Jacobson Jr., W.A. Watts, H. Almquist-Jacobson, B.C.S. Hansen, an A.C. dieffenbacher-Krall, "Long-term records of paleoclimate from central Florida: Evidence for major oscillations in paleohydrology during the past 70,000 years", Science, p. , vol. , ( ). manuscript to be submitted to Science,

Jacobson, G.L. Jr., E.C. Grimm, W.A. Watts. H. Almquist-Jacobson, B.C.S. Hansen, and A.C. Dieffenbacher-Krall, "A warm, moist Youger Dryas in subtropical Florida: Paleoecological evidence from Lake Tulane and Lake Annie", Science, p. , vol. , ( ). manuscript for submission,

Almquist-Jacobson, H.A., A.C. dieffenbacher-Krall, G.L. Jacobson Jr., E.C. Grimm, W.A. Watts, and B.C.S. Hansen, "Late-Quaternary paleohydrology of Lake Tulane, Florida, as revealed from lmultiple-core analysis of lake sediments", Bulletin of the Geological Society of America, p. , vol. , ( ). manuscript for submission,

Dieffenbacher-Krall, A.C. and W.A. Watts, "Identification of late-Quaternary plant macrofossils from Florida lake sediments", American Journal of Botany, p. , vol. , ( ). manuscript for submission,

Books or Other One-time Publications

Dieffenbacher-Krall, A.C., "Aquatic plants in Quaternary science", (1998). Thesis, Published
Bibliography: University of Maine, Orono

Watts, W.A., E.C. Grimm, and T.C. Hussey, "Mid-Holocene forest history of florida and the cpastal Plain of Georgia and south Carolina", (1996). Book, Published
Editor(s): Sassaman, K.E. and D.G. Anderson
Collection: Archaeology of the Mid-Holocene Southeast
Bibliography: pp. 28-38

Web/Internet Site

URL(s):

Description:

Other Specific Products

Contributions

Categories for which nothing is reported:

Activities and Findings: Any Outreach Activities
Any Product
Any Contribution

P.I.'s: G.L Jacobson Jr., E.C. Grimm, W.A. Watts, H. Almquist-Jacobson (ATM-9321265; $290,000 for Univ. of Maine portion; $190,000 for Illinois State Museum portion). September 1, 1994-January 31, 1999. "Collaborative Research: Long Records of Paleoclimate from Florida".

The objectives of this research were 1) to establish a high-resolution chronology for the sediment record from Lake Tulane, Highlands County, Florida, 2) to develop a lake-level reconstruction for Lake Tulane, and 3) to extend the regional and temporal paleoclimate records from Florida. In 1994, seven complete 10-cm diameter cores (from 8 to 19 m long) were collected from Lake Tulane and one 19-m core was obtained from Lake Annie. Fifty-seven AMS dates have been obtained for plant material from the master core from Lake Tulane. Particle size, charcoal, macrofossil, and pollen analyses have also been completed for that core. Pollen, particle size, and macrofossil analyses of the supplementary cores from Lake Tulane and the master core from Lake Annie have been completed. The data, which have just now been calibrated using the new radiocarbon dates, confirm the Grimm et al. (1993) interpretation of wet/dry oscillations at the site for the past 70,000 years. Furthermore, the evidence suggests that for several well-dated intervals (e.g., H2 and H3), warming in Florida preceded the flux of ice-rafted material into the North Atlantic sediments (Grimm et al. 1999, manuscript). The implication is that broad-scale warming led to massive discharges of icebergs, which then cooled the North Atlantic. Analyses of the late-glacial portions of the Tulane and Annie cores reveal that the Younger Dryas time in Florida was warm and moist, perhaps approaching late-Holocene conditions (Jacobson et al. 1999, manuscript). The project supported one Ph.D. student, Ann Dieffenbacher-Krall, at the University of Maine. Dieffenbacher-Krall was fully involved in all aspects of the project and worked extensively with Watts to identify plant macrofossils. A manuscript (Dieffenbacher-Krall and Watts 1999) describes the macrofossil assemblages and seed-identification parameters for Florida lake sediments. In addition, Dieffenbacher-Krall (1998) developed and tested a calibration of plant macrofossils to water depth for alkaline lakes in New England.

Publications anticipated from the project:

Dieffenbacher-Krall,A.C. 1998. Aquatic plants in Quaternary science. Thesis (Ph.D.), University of Maine, Orono.

Dieffenbacher-Krall,A.C. 1999. The relationship of modern plant macrofossils to water depth. Manuscript.

Dieffenbacher-Krall,A.C. 1999. Water-depth ranges of select aquatic plant taxa occurring in New England, United States. Manuscript.

Dieffenbacher-Krall,A.C., G.L. Jacobson Jr., and P.J.H. Richard. 1999. Responses of aquatic vascular plants to post-glacial climate change: a test of the Iversen hypothesis. Manuscript submitted to Geographie Physique et Quaternaire.

Dieffenbacher-Krall,A.C., and W.A. Watts.1999. Identification of late-Quaternary plant macrofossils from Florida lake sediments. Manuscript.

Hansen, B.C.S., E.C. Grimm, and W.A. Watts. 1998. Evidence of late-Tertiary climate oscillations in Florida: Evidence from Peace Creek (Polk Co.) sinkhole deposits. Manuscript for Bulletin of the Geological Society of America.

Grimm,E.C., G.L. Jacobson Jr., W.A. Watts, H. Almquist-Jacobson, B.C.S. Hansen, and A.C. Dieffenbacher-Krall. 1999. Long-term records of paleoclimate from central Florida: Evidence for major oscillations in paleohydrology during the past 70,000 years. Manuscript.

Jacobson,G.L. Jr., E.C. Grimm, W.A. Watts, H. Almquist-Jacobson, B.C.S. Hansen, and A.C. Dieffenbacher-Krall. 1999. A warm, moist Younger Dryas in subtropical Florida: Paloecological evidence from Lake Tulane and Lake Annie. Manuscript.

Almquist-Jacobson, H., A.C. Dieffenbacher-Krall, G.L. Jacobson Jr., E.C. Grimm, W.A. Watts, and B.C.S. Hansen. 1999. Late-Quaternary paleohydrology of Lake Tulane, Florida, as revealed from multiple-core analysis of lake sediments. Manuscript.

Watts, William A., Eric C. Grimm, and T. C. Hussey. 1996 Mid-Holocene Forest History of Florida and the Coastal Plain of Georgia and South Carolina. In Archaeology of the Mid-Holocene Southeast, edited by Kenneth E. Sassaman and David G. Anderson, pp. 28-38. University Presses of Florida, Gainesville.

P.I.'s: G.L Jacobson Jr., E.C. Grimm, W.A. Watts, H. Almquist-Jacobson (ATM-9321265; $290,000 for Univ. of Maine portion; $190,000 for Illinois State Museum portion). September 1, 1994-January 31, 1999. "Collaborative Research: Long Records of Paleoclimate from Florida".

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Dieffenbacher-Krall,A.C., and W.A. Watts.1999. Identification of late-Quaternary plant macrofossils from Florida lake sediments. Manuscript.

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Jacobson,G.L. Jr., E.C. Grimm, W.A. Watts, H. Almquist-Jacobson, B.C.S. Hansen, and A.C. Dieffenbacher-Krall. 1999. A warm, moist Younger Dryas in subtropical Florida: Paloecological evidence from Lake Tulane and Lake Annie. Manuscript.

Almquist-Jacobson, H., A.C. Dieffenbacher-Krall, G.L. Jacobson Jr., E.C. Grimm, W.A. Watts, and B.C.S. Hansen. 1999. Late-Quaternary paleohydrology of Lake Tulane, Florida, as revealed from multiple-core analysis of lake sediments. Manuscript.

Watts, William A., Eric C. Grimm, and T. C. Hussey. 1996 Mid-Holocene Forest History of Florida and the Coastal Plain of Georgia and South Carolina. In Archaeology of the Mid-Holocene Southeast, edited by Kenneth E. Sassaman and David G. Anderson, pp. 28-38. University Presses of Florida, Gainesville.