Olsen, P.E., Cornet, B., and McDonald, N.G., 1989, Cyclostratigraphy of the Chicopee Fish Bed and adjacent strata: implications for the palynostratigraphy of the Portland Formation (Early Jurassic, Newark Supergroup). Geological Society of America, Abstracts with Programs. v. 21, no. 2, p. 56.

the surface of the central part of the Cobb Island lagoon influence patterns of drainge and inundation and are a testimony to previous barrier occupations.

№ 13848

THE STATEN ISLAND SERPENTINITE BODY-A VERSATILE OUTDOOR LABORATORY FOR PHYSICAL AND HISTORICAL GEOLOGY CLASSES

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Staten Island is located in the southern most portion of New York City and is part of the Manhattan Prong. A 5x11 kilometer serpentinite body exists here as a ridge former, extending up to 125 meters above sea level and occurs in many large and easily accessible outcrops. Originally a harzburgite/dunite rock, the body has been metamorphosed under greenschist facies into serpentine group minerals: (lizardite = 75-80 modal%, chrysotile <2%, antigorite <1%), magnetite, brucite, talc, and amphiboles. In thin section, remnant olivine (**Fo 90-99**) and enstatite (**En 89-98**) can be observed in various stages of alteration, with chromium spinel (**Cr/Cr + Al + Fe = 0.65-0.85**) existing as an accessory mineral. Low temperature geochemical reactions have produced a wide variety of over 25 unusual and rare minerals that can be used show the effects of chemical weathering and allow the determination of a weathering sequence.

This fault bounded serpentinite exhibits northeast trending folds and kink bands and represents the remains of an ophiolite complex that was emplaced as part of the Applachian Ultramafic belt during the Taconic Orogeny. Uplift, erosion, and post Taconic deformational features such as conjugate joint sets, fault controlled valleys, and grabens, are easily studied and observed in the field for use in interpreting the local geologic history of the region.

Lastly, this metamorphic body has been glacially sculpted, showing an overall classical roche moutonnee form, glacial plucking, valley widening, and debris from the Pleistocene Harbor Hill Terminal moraine. A descriptive field trip guide will be available.

№ 14583

HIGH-RESOLUTION, SEISMIC-REFLECTION STUDIES IN THE OFFSHORE OF SOUTHERN NEW ENGLAND: A BRIEF REVIEW

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The U. S. Geological Survey, in cooperation with Massachusetts and Connecticut, has conducted systematic high-resolution seismic reflection surveys of the glaciated inner continental shelf off southern New England from western Long Island Sound to the Massachusetts/New Hampshire border. Most seismic profiles were oriented roughly normal to the coast and spaced about a mile apart. The purpose of these surveys is to make geologic maps and to determine the geologic framework and history of the offshore region. Throughout these studies, the onland geologic record has provided control and the basis for a working hypothesis.

The deepest reflector is generally underlain by bedrock or strata of Cretaceous and Tertiary age and defines an unconformity of fluvial and glacial origin. The overlying late Wisconsinan drift has been divided, on the basis of characteristic seismic signatures and cores, into till, glaciofluvial outwash, and glaciolacustrine or glaciomarine deposits. The drift is capped by fluvial and marine transgressive unconformities. Late Wisconsinan to Holocene marine deposits atop the drift have been divided into fluvial, estuarine, beach, and offshore bar deposits.

The high-resolution, seismic-reflection data have contributed to our understanding of the late Quaternary geologic history. In the western Gulf of Maine, that history includes deglaciation of the marine-based Laurentide ice sheet and postglacial relative sea-level change. Along the south coast of New England, the seismic data have revealed the development of major proglacial lakes during ice retreat. Recently, the seismic data have provided evidence for a late-Wisconsinan marine incursion into Cape Cod Bay and, in Long Island Sound, evidence for an intermediate ice front stillstand and irregularities in the postglacial marine transgression.

№ 15112

CYCLOSTRATIGRAPHY OF THE CHICOPEE FISH BED AND ADJACENT STRATA: IMPLICATIONS FOR THE PALYNOSTRATIGRAPHY OF THE PORTLAND FORMATION (EARLY JURASSIC, NEWARK SUPERGROUP)

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Two separate sections [Cabotville (Chicopee) and Chicopee Falls] exposed along the Chicopee River and one along the Westfield River (at Mittineague) in Massachusetts match exactly in cyclostratigraphy over a distance of 8.6 km. The match in Van Houten cycles suggests that these three sections are repeated outcrops of the same stratigraphic interval, even though the outcrops do not line up along regional strike.

One Van Houten cycle in each section contains a black microlaminated carbonate unit (the Chicopee Fish Bed) which contains abundant specimens of the fishes *"Acentrophorus" chicopensis* and *Semionotus* sp. *"Acentrophorus" chicopensis* is unknown elsewhere in the Newark Supergroup. Cut slabs of the carbonate unit from each section show an almost exact correspondence in the pattern of microlaminae and laminae, and thus the correlation between these three sections is assured.

Stratigraphically above the Chicopee Fish Bed along the Westfield River at Agawam are beds which produce pollen assemblages dominated by *Corollina torosa*, as is the case for the most of the lower Portland Formation. Pollen assemblages from below the Chicopee Fish Bed at Cabotville are dominated by *Corollina murphyi*. The Cabotville section was originally thought to be stratigraphically above the Agawam section by projection along strike, and therefore a separate pollen zone, the *Corollina murphyi* zone, was proposed. However, our new physical stratigraphy of the Mittineague, Cabotville, and Chicopee Falls sections shows that the the *C. murphyi* beds occur below beds dominated by *Corollina torosa* and hence are still within the *C. torosa* zone. The presence of Callialasporites spp. in the Agawam beds and their absence in strata adjacent to the Chicopee Fish Bed and below is compatible with this interpretetion. Clearly, the relative abundance of *C. murphyi* and *C. torosa*, fluctuate through the Portland Formation, perhaps in a cyclic fashion, and thus the validity of a formal *C. murphyi* biozone is in question. It is still possible, however, that the fluctuations in relative abundance of *Corollina* species may be useful for correlation.

№ 15697

CRETACEOUS DEPOSITIONAL SEQUENCES OF THE NEW JERSEY CONTINENTAL MARGIN

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Thirteen depositional sequences are identified on lithostratigraphy, biostratigraphy, and seismic reflection stratigraphy in the Lower and Upper Cretaceous of the New Jersey Atlantic margin. The uppermost sequence (uppermost Maestrichtian to lower Paleocene) is characterized by the Maestrichtian planktonic foraminifer Racemiguembelina fructicosa and the Paleocene foraminifera Subbotina pseudobulloides. The upper Maestrichtian sequence below is identified by the species Gansserina gansseri and R. fructicosa. The uppermost Campanian to lower Maestrichtian sequence contains Globotruncanita calcarata and Rugotruncana subcircumnodifer. A middle Campanian sequence and a lower Campanian sequence are separated by species of the benthic foraminifer Bolivinoides; B. culverensis in the middle sequence and B. strigillatus in the lower sequence. A Santonian sequence contains Dicarinella concavata, Marginotruncana pseudolinneiana, and Globotruncana fornicata. A nonmarine sequence of fluvial sands and clays between the Santonian sequence above and the Turonian to upper Cenomanian sequence below is tentatively correlated as Coniacian. The Turonian to upper Cenomanian sequence is identified by the species Helvetoglobotruncana helvetica and Rotalipora cushmani. An upper Albian to lower Cenomanian sequence contains Rotalipora appenninica and Planomalina buxtorfi, and the benthic foraminifers Epistomina lenticularia and E. cf. hechti. Rotalipora subticinensis and Ticinella primula characterize a middle to upper Albian sequence. The three lower sequences which are identified on a coastal plain vibroseis line consist of nonmarine sands, silts and clays. They are placed in the Aptian, Barremian, and Valanginian. The boundaries of nine sequences identified with biostratigraphy correlate with type 1 unconformities on the cycle chart of Haq et al. (1987). The sequences for the most part, probably include more than one third-order cycle.

№ 15188

MARINE TERTIARY DEPOSITIONAL HISTORY OF THE NEW JERSEY COASTAL PLAIN

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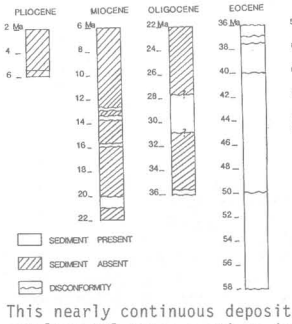
The marine Tertiary depositional history of the New Jersey Coastal Plain, as shown in the figure, was determined through a study of the sediments and microfossils, (calcareous nannofossils diatoms and planktic foraminifers). The lower Paleocene (Danian) was mostly a period of nondeposition. The notable exception was deposition in the middle Danian (~64 Ma). Deposition in the New Jersey Coastal Plain was nearly continuous from the beginning of the late Paleocene (Selandian, ~62 Ma) through the early Oligocene (Rupelian, ~36 Ma). Disconformities are numerous in this section but these represent very short times.



This nearly continuous deposition resulted in one of the most complete Paleogene sections in the world. The remaining Oligocene was a period of nondeposition except in the middle Oligocene (Chattian) between 28 and 31 Ma. Most of the Miocene and all of the Pliocene were also periods of marine nondeposition. Miocene deposition occurred in the Burdigalian (between 20 and 21 Ma), in the Langhian (~16 Ma), and twice in the Serravallian (~13.5 and 13 Ma).

№ 8218

Zr/Hf SYSTEMATICS IN ALKALINE GRANITES: CASE STUDY OF THE CAPE ANN COMPLEX, NORTHEASTERN MASSACHUSETTS

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The Cape Ann Complex is a well exposed group of alkali intrusions located northeast of Boston, Massachusetts. This complex , (295 km^2) predominantly made of an array of hypersolvus granites and syenites, contains a smaller amount of subsolvus granites and co-