morphism (Vance and Holland, 1993), equivalent to approx. 10 km of denudation. Boudinaged layers and stretched porphyroblasts within the attenuated zone also indicate extension. Rosenfeld (1968) recognized west-southwest directed layer-parallel extension and layer-perpendicular shortening in stretched pebble conglomerates of the Silurian Shaw Mountain Formation showing that extension is not restricted to pre-Silurian rocks. Thus, extension and crustal thinning were accomplished by internal strain as well as displacement on multiple faults distributed throughout a significant crustal section. Assuming that decompression resulted entirely from tectonic denudation and that average fault dips were 10 to 30 degrees, the relative displacement of rocks above and below the attenuated zone during extension was between 60 to 20 km.

Early Acadian crustal thickening led to metamorphism at pressures up to approx. 10 kbar around the Chester dome (Kohn and Spear, 1990). Below the attenuated zone, garnet cores record this higher-pressure metamorphism and contain abundant rutile inclusions. Garnet growth was interupted by a temperature decrease accompanying extension and decompression. A second lower-pressure prograde metamorphism and garnet growth stage, lacking rutile inclusions, produced unconformity textures and reflects a temperature increase caused by enhanced heat flow. Peak metamorphic temperatures were reached after extension but prior to later, dome-stage Acadian folding.

9:10 AM Kidd, William S.F.

THE IMPORTANCE OF SYN-CONVERGENCE FLEXURAL NORMAL FAULTS IN THE CHAMPLAIN THRUST SYSTEM

KIDD, William S.F., Univ at Albany, Dept of Earth and Atmospheric Sciences, Albany, NY, 12222, HAYMAN, Nicholas W, Univ of Washington, Dept of Earth and Space Science, Box 351310 / JHN 063, Seattle, WA, 98195

The Champlain Thrust System (CTS) of the Taconic thrust belt in west-central Vermont contains transverse structures and frontal ramps that were controlled by reactivated normal faults. These reactivated normal faults were inherited from a phase of syn-convergence lithospheric flexure during medial Ordovician Taconic collision between the Laurentian margin and island arc terranes. The normal faults cut the pre-transport stratigraphic section, affected syn-convergence sedimentation, bounded local flysch basins, and partitioned displacement along strike. Map-unit relationships where the amount of stratigraphic offset across thrusts and thrust-linking structures does not match the corresponding structural offset are the best evidence for these conclusions. The CTS has several major splays that have along-strike displacement gradients determined by normal faults reactivated as lateral thrust-structures. One lateral structure links the apparent "tip-line" of the Champlain thrust with a large-displacement thrust that continues into New York. In the autochthon, the flexural normal faults are in a dominantly paleo-trench parallel orientation with a subordinate paleo-trench normal set. In the transported portion of the foreland (the par-autochthon), the thrust structures mask the set of paleo-trench parallel normal faults. However, an out of sequence thrust that led to the emplacement of shelf rocks above the par-autochthonous shale nucleated on a paleo-trench parallel normal fault in the outer shelf. The flexural normal faults thus controlled the structural style and the distribution of sedimentary facies along the Laurentian margin and the thrust faults occupy the same structural level as normal faults in the present-day subsurface. Our findings are consistent with a generally foreland-propagating far-traveled Taconic thrust system with a decollement that traces under transported shelf-sequence rocks, and a detached Green Mountain crystalline core on an out-of-sequence thrust, with the decollement level perhaps partly determined by the pre-thrust flexural normal fault system. Other foreland thrust systems may prove to contain significant syn-convergence normal fault components, and their recognition may help in resolving current geodynamic problems of thick-skinned thrusting, displacement partitioning along thrusts, and reactivation/inversion.

9:30 AM Goldstein, Arthur

INTERMEDIATE-TERM HISTORY OF THRUST FAULTING IN THE TACONIC ACCRETIONARY WEDGE

GOLDSTEIN, Arthur, Colgate Univ, Dept. of Geology, Hamilton, NY, 13346-1398

Short-term history of thrust faults is reflected in cycles of seismic energy accumulation and release or stable sliding (102 - 103 years). Long term history of thrust faults is tied to cycles of plate boundary interactions (106-107 years). Intermediate term history (104-105 years)is more difficult to discern. In the Taconic slate belt of eastern NY and western Vt. we have identified very large pyrite framboid pressure shadows which record the strain history during the Taconic orogeny. The pressure shadows record three episodes of largely coaxial strain resulting in a cumulative strain of approximately 100%. At geologically reasonable strain rates it would take approximately 106 years to accumulate this strain. We have measured stable isotope compositions in quartz and calcite in these shadows and have combined these data with fluid inclusion data to yield a history of temperature and fluid pressure during the course of the strain accumulation. The framboids lie immediately below the Bird Mountain Thrust and allow the interpretation of fault history over a time period of a million years. We find regular variations in delta 18O of quartz, cycling from ~19.5 to 20 and back to 19.2. Coupled with calcite O isotopes, these data reveal a history of temperatures beginning at 250°C, falling to 200°C and increasing to 280°C. We interpret these results as indicating a period of cooling of approximately 300,000 years following a thrust motion episode, a period of heating during a second thrust motion episode of similar duration and a second cooling of equal duration. Periods of heating correlate with periods of high fluid pressure and both these correlate to changes in orientations of incremental strain. We believe that these record two episodes during which the Taconic accretionary prism was built up by thrust faulting to attain a critical taper angle and two episodes of horizontal extension during which the wedge was acting to decrease the taper angle.

9:50 AM Crespi, Jean M.

EVIDENCE FOR LIMITED VOLUME CHANGE DURING SLATY CLEAVAGE DEVELOPMENT IN THE TACONIC ACCRETIONARY WEDGE, NORTHEASTERN USA

GOLDSTEIN, Arthur, Colgate Univ, Dept. of Geology, Hamilton, NY, 13346-1398, CRESPI, Jean M., Univ of Connecticut, Dept. of Geology and Geophysics, Storrs, CT, 06269-2045

Calculations of volume change in shear zones provide one means of understanding fluid flow in the crust, large-magnitude volume loss suggesting large fluid fluxes and constant-volume deformation suggesting closed-system behavior and diffusive mass transport. Although simple in theory, geometric techniques for the calculation of volume change are hampered by the scarcity of appropriate markers and the difficulty of separating the tectonic component from the total volume-change estimate. We have overcome these problems in the Taconic slate belt where strata contain both deformed graptolites and strain fringes around pyrite framboids and samples can be obtained from different structural positions around isoclinal folds.

On the basis of field relations and detailed microstructural observations, we have inferred the following sequence of events: (1) deposition of the graptolites; (2) dewatering of the strata as a result of (a) burial compaction and (b) tectonic consolidation; (3) flexural folding; and (4) slaty cleavage development during which time the graptolites underwent pyritization. The strain fringes formed during (4) and indicate top-to-the-west-northwest non-coaxial flow. The graptolites, which lie in the bedding plane, underwent changes in length during (2b) and (4).

Previously, we have shown that the amount of prelithification tectonic volume change can be estimated from samples where bedding and cleavage are parallel by removing the strain recorded by the strain fringes from that recorded by the graptolite thecal spacing. Here, we present new ideas about how the data sets can be combined to estimate the amount of volume change undergone by the strata during slaty cleavage development. The strain-fringe data are used to predict the length change undergone by graptolites in samples where bedding lies at an angle to cleavage. The predictions are compared to length changes determined by restoring the displaced pyrite blocks composing the graptolites and from graptolite thecal-spacing measurements. The results are inconsistent with large-magnitude volume loss and do not support large fluid fluxes through the Taconic accretionary wedge during slaty cleavage development.

10:30 AM Rankin, Douglas W.

ORDOVICIAN SEDIMENTARY BRECCIA AND MAGNETITE-COTICULE METASILTSTONE, NORTHEAST KINGDOM, VERMONT

RANKIN, Douglas W., US Geological Survey, Mail Stop 926 National Ctr, Reston, VA, 20192-0001

Metasiltstone and metasandstone of the Arenig Albee Formation underlie most of the Stone Mountain quadrangle. Near Burnside Mountain, sedimentary breccia, as thick as 200 m, forms the limbs of a NNE-trending syncline in the Albee. Basal breccia consists of Albee clasts, up to a meter long, in a matrix of Albee-like siltstone and sandstone. Higher in the breccia the matrix is black pelite or micaceous siltstone. Although clasts of Albee dominate, the suite includes black slate, coticule-bearing siltstone, and sparse quartz pebbles; no volcanic clasts were observed. An Fe-rich unit of siltstone, chert, and ironstone forms the trough of the 1 x 8 km syncline. All lithologies may be magnetite-rich and coticule-bearing. The unit produces a positive magnetic anomaly of about 1000 nT (USGS Map I-1898-E). The breccia/Fe-rich unit contact may be gradational through interlayering over a few meters. The forearc basin, in which the Albee was deposited, deepened and marginal slopes became unstable producing debris flows. As water depth increased or the source became more distal, breccia matrix changed from sand to mud. The Fe-rich coticule unit, in an outlier to the east, is overlain by the Ordovician Partridge Formation and may be coeval with volcanism farther east in the Ammonoosuc arc.

The breccia and magnetite-coticule unit were mapped as Clough and Littleton Formations, respectively, by Johansson in 1963. The western breccia was shown by Moench and others in 1995 as Silurian Smalls Falls Formation with admixed volcanic rocks; the magnetite-coticule unit was shown as Devonian Ironbound Mountain Formation. The eastern breccia was interpreted by Moench in 1999 as marking the base of the Piermont allochthon. An Ordovician age for all rocks of the syncline is supported by these observations in the Upper Connecticut Valley: 1) coticules characterize some sedimentary rocks of the Ammonoosuc Volcanics; coticules are absent in Siluro-Devonian rocks, 2) magnetite is locally present in the Albee and some sedimentary rocks of the Ammonoosuc, but not Siluro-Devonian rocks.

10:50 AM Ratcliffe, Nicholas M.

PRE-OTTAWAN DEFORMATION AND TRANSPRESSIONAL FAULTING IN THE HUDSON HIGHLANDS OF NEW YORK BASED ON SHRIMP ZIRCON AGES OF THE STORM KING GRANITE AND THE SYNTECTONIC CANOPUS PLUTON

RATCLIFFE, Nicholas M., U.S. Geol Survey, 926A National Center, 12201 Sunrise Valley Dr, Reston, VA, 20192, ALEINIKOFF, John N., US Geol Survey, PO Box 25046, Denver, CO, 80225-0046

New SHRIMP isotopic ages of zircon from the Storm King Granite (of Berkey, 1909) at Dunderberg Mountain indicate an intrusive age of 1174±8 Ma and overgrowth ages of 1114±15 Ma. These ages are considerably older than previous estimates of the Storm King of about 1130 Ma, the Byram Intrusive Suite (~1095 Ma, Drake et al., 1991), and the Vernon Super Suite (1116±41 Ma to 1095±9 Ma, Rb-Sr WR, Volkert et al., 2000) all of which contain the regional YF2 folds and the dominant gneissosity of the Hudson Highlands. The Canopus pluton was intruded into an active right-lateral shear zone following YF2 folding at 1144±13 Ma based on a new SHRIMP zircon age. Overgrowths grew at about 1000 Ma. These data indicate that the intense YF2 folding event and formation of gneissosity occurred between about 1174 and 1144 Ma during the Shawinigan Pulse of the Grenville orogeny rather than in the Ottawan Pulse (as defined by Rivers, 1997). A broad zone of transpressional folding accompanied intrusion of the Canopus pluton both to the west and to the east of the right-lateral Canopus shear zone. Late upright north-plunging YF3 folds and syntectonic intrusion of the Canada Hill granite at 1010±6 Ma (Aleinikoff and Grauch, 1990; Ratcliffe, 1992) may be the only expression of Ottawan Pulse tectonism in the Hudson Highlands. Previous age assignments of Grenville events based on previous U-Pb zircon and Rb-Sr isotopic ages for many of these hard-to-date rocks are reevaluated in the light of these new data and our evidence for pre-Ottawan structures in the Mount Holly Complex of Vermont.

11:10 AM Mosher, Sharon

STRAIN ACCOMMODATION ALONG THE MACQUARIE RIDGE COMPLEX: TRANSITION FROM TRANSTENSION TO TRANSPRESSION ALONG AN ACTIVE PLATE BOUNDARY

MOSHER, Sharon and WERTZ, Karah, Univ Texas - Austin, Dept Geological Sciences, Austin, TX, 78712, COFFIN, Millard F., Univ Texas - Austin, Institute for Geophysics, Austin, TX, 78759-8500, MASSELL, Christina G., Scripps Institute Oceanography, La Jolla, CA, 92093-0205

The Macquarie Ridge Complex, which defines the Australian-Pacific plate boundary south of New Zealand, has evolved from an active spreading center to a transform plate boundary over the last 40 million years. This major fault zone shows a complex history of both transtension and transpression, with strain being partitioned between oblique spreading and faulting. Marine geophysical data, including high quality sidescan sonar, swath bathymetry, seismic reflection, gravity, and magnetics, plus field data from Macquarie Island, an uplifted piece of oceanic crust and

9:50 AM Hayden, Trent E.

INTRA-STAGE 5 HIGH SEA LEVEL STANDS IN BERINGIA: 5E/D OR 5A/4?

HAYDEN, Trent E. and BRIGHAM-GRETTE, Julie, Univ of Massachusetts, Geosciences, Morrill Science Center, Amherst, MA, 01003

The most laterally continuous marine deposits in the Beringian region are those of the last interglacial, oxygen-isotope stage 5. Deposits of sub-stage 5e are represented on the Alaskan coast by marine deposits of the Pelukian transgression (Brigham-Grette and Hopkins, 1995) and a later high sea level event within stage 5 represented by the Flaxman formation. Extensive stage 5 deposits can also be found on Chukotka Peninsula, northeastern Siberia, as well as on St. Lawrence Island within glaciotectonically deformed marine and glacigenic sequences. An analysis of the stratigraphy and alloisoleucince/Isoleucine ratios obtained from fossil mollusk shells by Brigham-Grette et al. (in press) have indicated post sub-stage 5e high sea level stands within these sequences was preceded by a rapid and intense glaciation in northeast Russia and St. Lawrence Island. However, the epimerization reaction of L-isoleucine to D-alloisoleucine occurs at an insufficient rate to separate out intra-stage 5 events. An alternative geochronologic method must be used to separate these events and determine whether post sub-stage 5e high sea level events in Beringia occurred during the 5e/5d or 5a/4 transition.

Gas chromatographic (GC) analysis has the ability to separate D/L ratios of all common amino acids found in mollusk shells. Goodfriend et al. (1996) analyzed amino acid ratios in bivalves of Arctic marine deposits and determined that the higher racemization rate of aspartic acid provided significantly higher temporal resolution. This method, not widely applied to the arctic, has been used to reanalyze shells from high sea level stands of sub-stage 5e and post 5e collected from the Flaxman formation, Alaska, the Val'katlen and Nunyamo sections, northeast Russia, and marine deposits of St. Lawrence Island. To support our results, electron spin resonance (ESR) geochronology was also utilized to serve as an independent proxy to test the reliability of the GC ratios.

10:30 AM Fasy, Mary-Katherine

LAMINATED SEDIMENTS AND PALEOENVIRONMENTAL RECONSTRUCTION IN THE CENTRAL CANADIAN ARTIC ARCHIPELAGO NUNAVUT, CANADA

FASY, Mary-Katherine and JANUKAJTIS, Forrest, Bates College, geology, Box 196, Lewiston, ME, 04240

In order to gain a greater understanding of recent climatice changes in the Canadian arctic, laminated sediments were recovered from Cape Hurd Lake in the central Canadian artic archipelago, Nunavut, Canada. The laminated sediments are likely varves and thus may record distinct seasonal and interannual changes in hydrology, limnology and ultimately past climate. Cape Hurd Lake is fed by two inlet streams and influenced by the ablation and accumulation of an adjacent ice cap. Cape Hurd is a meromictic, flat-bottomed lake at sea level and is ideal for the preservation of laminations. As a result, the laminations or varves, which are preserved, serve as an accurate paleoenvironmental indicator because the laminations reveal information about the local biologic, geochemical and sedimentological processes in response to seasonal fluxuations. The study focuses on a detailed analysis of thin sections taken from cores retrieved from Cape Hurd Lake during May of 2000 and the summer of 1999.

The goal of the study is understand the pattern of laminated sediment variability observed in the thin sections, which are driven by changes in temperature, precipitation, ice cover, glacial retreat and advance through the late Holocene. This will be undertaken through the detailed examination of grain structure and chemical composition of the lamina using petrographic microscopy and SEM-EDS for detailed structural and compoisitional variability. Specific attention will be paid to variability in the last millenium where short term events such as the Little Ice Age and the 20th Century warming may be detected by changes in structure and composition of the laminated sediments.

10:50 AM Mankoff, Evan

PHYSICAL CHARACTERISTICS AND BATHYMETRY OF ICE-CONTACT, PROGLACIAL SHERIDAN LAKE, SHERIDAN GLACIER, ALASKA

FLEISHER, P. Jay, SUNY - Oneonta, Earth Sciences, Oneonta, NY, 13820-4015, MANKOFF, Evan, SUNY-Oneonta, Earth Sciences, Oneonta, NY, 13820-4015, BAILEY, Palmer K., Univ of North Dakota, Geology Department, Grand Forks, ND, 58202

Sheridan Lake evolved during retreat of Sheridan Glacier from an 18th century moraine. Separation from once confluent Sherman Glacier provided space for spreading of a small, 5 km wide piedmont lobe. Since 1950 (earliest topographic quadrangle) several ephemeral basins merged, and by 1965 three distinct and separate, ice-contact, proglacial lakes had formed, each with separate outflow streams. Aerial photos show that continued retreat during the ensuing decade led to the coalescing of the western and southern basins, drained by Sheridan River, as the eastern basin filled with Sherman Glacier outwash.

The lake shore and ice front position are represented on a new 2000 GPS-based map. The ice front maintains a uniform trend where the gently sloping ice surface enters the lake, but consists of ice-wall promontories and wedge-shaped reentrants where calving along intersecting splaying crevasses occurs.

Bathymetric information reveals a common ice front depth ranging from 40-70 m. However, within a wedge-shaped reentrant reaching 400 m up glacier, the lake bottom plunges from 65 m to 130 m, thus placing the lake floor 85 m below msl. Comparison with 1999 depth data indicates negligible annual sediment accumulation. This may be related to very low turbidity (<0.01 g/L), a condition unexpected from a graywacke provenance. Low suspended sediment combined with uniform temperature values (0.4-0.6°C) throughout the water column suggest a lack of subglacial water inflow.

11:10 AM Hensler, Stephen M.

HIGH-LEVEL PROGLACIAL LAKES, SOUTHERN CAYUGA VALLEY, NEW YORK

HENSLER, Stephen M. and KNUEPFER, Peter L. K., Binghamton Univ, Dept. of Geological Sciences and Environmental Studies, Binghamton, NY, 13902

Ice retreat from the Valley-Heads moraines (VHM) positions in the Finger Lakes of New York resulted in impoundment of pro-glacial lakes within the troughs. Previous workers have correlated hanging deltas to define a number of proglacial lakes in the Cayuga trough. While re-investigating these major lakes, we have identified a series of local high-level lakes that were impounded in tributary valleys as ice retreated from the uplands but persisted in the main north-south trough. Retreat of the ice lobe in Cayuga Valley blocked the outlets of both Enfield Glen and West Branch Cayuga Inlet during initial retreat from the VHM north of Spencer. This blockage of Cayuga Trough by the valley glacier and an outlet through the VHM at Pony Hollow formed an initial high-level Lake Enfield, which existed at about 1250 feet (380 m). The Pony Hollow outlet was abandoned as the Cayuga trough glacier retreated far enough north to allow water to escape between the glacier and the north side of Benjamin Hill south of Newfield. As the elevation of Lake Enfield lowered, a drainage divide developed just south of the headwaters of Fish Kill near Newfield at a modern elevation of 1175 feet (358 m), separating Lake Enfield into two bodies (including a short-lived southern lake we name Lake Newfield). Meltwater escaping via this outlet carved a bench at an elevation of 1090-1140 feet (332-348 m) into the west side of the main Cayuga Valley wall south of Newfield. The bench is marked by kettle topography, likely from ice that calved from an ice margin at Lake Enfield. Lake Newfield gradually dropped to the 1130-foot (345-m) level through outlet drainage and quickly disappeared. Subsequently, water from Lake Enfield continued to use the Fish Kill outlet, carving a spillway which is preserved today. Thus the small high-level lakes had complicated histories, strongly affected by both ice dynamics and local outlets and overflows.

11:30 AM Astley, Beth N.

EVIDENCE FOR HOLOCENE LAKE-LEVEL CHANGE FROM TWO LAKE CHAMPLAIN WETLANDS

ASTLEY, Beth N., CRREL - Anchorage, 724 Quartermaster Road, Door 1, PO Box 5646, Fort Richardson, AK, 99505

Sixteen radiocarbon-dated cores from two lakeshore wetlands in Lake Champlain indicate that lake-level has risen in three distinct phases during the Holocene. During phase I (10,000-7,500 yr B.P.), lake level rose rapidly in response to similarly rapid isostatic rebound which increased lake volume by raising the sill controlling lake outflow. This was followed by a stillstand during phase II (7,500-5,000 yr B.P.), most likely associated with glacial forebulge collapse. Renewed isostatic rebound of the sill at a slower rate continued to cause lake-level to rise during phase III (5,000 yr B.P. - Present). It is estimated that lake level has risen approximately 8 meters in the northern end of Lake Champlain in the last 9,300 yr B.P., with a greater magnitude of lake-level rise in the central and southern end of the lake due to differential tilting of the basin. Isostatic rebound has been the long-term control on lake-level change throughout the Holocene, with climate change acting as a secondart control.

SESSION 4, 8:15 AM

Monday, March 12, 2001

S2. Fault Zone Evolution and Convergent Tectonics: A Symposium in Honor of Rolfe Stanley

Sheraton Burlington Emerald Salon I

8:30 AM Robinson, Peter

SUBDUCTION ZONE TECTONICS COMES TO NEW ENGLAND: FOLLOWING THE ROLFE STANLEY APPROACH TO THE HINTERLAND

GEE, David G., Uppsala Univ, Earth Sciences, Villavagen 16, S-75236, Uppsala, TERRY, Michael P., Old Dominion Univ, Dept Ocean, Earth & Atmospheric Sci, Norfolk, VA, 23529-0276, ROBINSON, Peter, Geol Survey of Norway, Trondheim, N7491, TUCKER, Robert D., Dept Terrestrial Magnetism, 5241 Broad Branch Rd NW, Washington, DC, 20015-1305

Several workers related features of the Taconian foreland of New England to subduction processes, but Rolfe Stanley was the first to carry these ideas deep into the hinterland even into the magmatic arc. Influenced by experiences in a subduction system in Taiwan and his mentor, John Rodgers, he used a comparative approach to explain New England tectonics. Here we apply this approach to understand the nature of subduction and collision between Laurentia and Baltica during middle Paleozoic in Scandinavia, and between Laurentia and Avalonia in middle and late Paleozoic in New England. Tectonostratigraphic relationships and geochronologic data in Scandinavia indicate that development of NW-directed subduction and related thrust imbrication gradually stepped toward and deeper into the Baltica craton, carrying previously metamorphosed rocks over cooler rocks of the craton margin. Most remarkable were rocks that were subducted as deep as 125 km at ~407Ma and then exhumed at "plate tectonic rates" to 60 km by continued thrusting over about ~6 m.y., synchronous with high-level extensional faulting. The essential shut down of magmatic activity in this orogen ~430Ma, except minor pegmatites, testifies that exhumation was not due to buoyant exhumation following delamination of a lithospheric root. A well developed stratigraphy and igneous geochronology in New England suggests there was a similar system related to SE-directed subduction of a Silurian margin of Laurentia beneath Avalon. Here, however, no exhumed products of deep-seated cool metamorphism are found, but instead voluminous magmatism progressing in a wave from coastal New England in latest Silurian ~423Ma to the Connecticut Valley region in Mid-Devonian ~380Ma, and additional heat and magmatism in Late Devonian - Early Mississippian, Late Pennsylvanian, and Permian. The location of magmatism both in the overriding and subducting plates, and occurrence of mantle- and crust-derived melts speaks for one, or several events of lithospheric delamination in this part of the continental collision zone.

8:50 AM Karabinos, Paul

ACADIAN EXTENSION IN WESTERN NEW ENGLAND

KARABINOS, Paul, Williams College, Dept. Geosciences, Williamstown, MA, 01267

A dramatic feature of the geology of western New England is the thinness of some Paleozoic units east of the Green Mountain and Berkshire massifs in southeastern Vt. and western Mass. compared to equivalent units north, west, and south of the massifs. These structurally thinned units are widely interpreted as preserving a Taconian accretionary wedge and arc complex. The attenuation of these units is most compelling around the Chester dome where rocks lithologically equivalent to the Pinney Hollow, Ottauquechee, Stowe, and Missisquoi Formations are locally one to two orders of magnitude thinner than they are elsewhere. P-T paths for rocks structurally below the attenuated zone in the Chester dome suggest 2.5 kbar of decompression during Acadian meta-

10:10 AM Break

10:30 AM Fasy, Mary-Katherine, Janukajtis, Forrest*: LAMINATED SEDIMENTS AND PALEOENVIRONMENTAL RECONSTRUCTION IN THE CENTRAL CANADIAN ARTIC ARCHIPELAGO NUNAVUT, CANADA [2501]

10:50 AM Mankoff, Evan*, Fleisher, P. Jay, Bailey, Palmer K.: PHYSICAL CHARACTERISTICS AND BATHYMETRY OF ICE-CONTACT, PROGLACIAL SHERIDAN LAKE, SHERIDAN GLACIER, ALASKA [2113]

11:10 AM Hensler, Stephen M., Knuepfer, Peter L. K.*: HIGH-LEVEL PROGLACIAL LAKES, SOUTHERN CAYUGA VALLEY, NEW YORK [2512]

11:30 AM Astley, Beth N.*: EVIDENCE FOR HOLOCENE LAKE-LEVEL CHANGE FROM TWO LAKE CHAMPLAIN WETLANDS [3135]

SESSION NO. 4

S2. Fault Zone Evolution and Convergent Tectonics: A Symposium in Honor of Rolfe Stanley

8:15 AM, Sheraton Burlington, Emerald Salon I

Keith Klepeis, and Marjorie Gale, Presiding

8:15 AM Introductory Remarks

8:30 AM Robinson, Peter*, Terry, Michael P., Gee, David G., Tucker, Robert D.: SUBDUCTION ZONE TECTONICS COMES TO NEW ENGLAND: FOLLOWING THE ROLFE STANLEY APPROACH TO THE HINTERLAND [2592]

8:50 AM Karabinos, Paul*: ACADIAN EXTENSION IN WESTERN NEW ENGLAND [2580]

9:10 AM Kidd, William S.F.*, Hayman, Nicholas W.: THE IMPORTANCE OF SYN-CONVERGENCE FLEXURAL NORMAL FAULTS IN THE CHAMPLAIN THRUST SYSTEM [1661]

9:30 AM Goldstein, Arthur*: INTERMEDIATE-TERM HISTORY OF THRUST FAULTING IN THE TACONIC ACCRETIONARY WEDGE [2765]

9:50 AM Crespi, Jean M.*, Goldstein, Arthur: EVIDENCE FOR LIMITED VOLUME CHANGE DURING SLATY CLEAVAGE DEVELOPMENT IN THE TACONIC ACCRETIONARY WEDGE, NORTHEASTERN USA [2546]

10:10 AM Break

10:30 AM Rankin, Douglas W.*: ORDOVICIAN SEDIMENTARY BRECCIA AND MAGNETITE-COTICULE METASILTSTONE, NORTHEAST KINGDOM, VERMONT [2396]

10:50 AM Ratcliffe, Nicholas M.*, Aleinikoff, John N.: PRE-OTTAWAN DEFORMATION AND TRANSPRESSIONAL FAULTING IN THE HUDSON HIGHLANDS OF NEW YORK BASED ON SHRIMP ZIRCON AGES OF THE STORM KING GRANITE AND THE SYNTECTONIC CANOPUS PLUTON [2303]

11:10 AM Mosher, Sharon*, Massell, Christina G., Wertz, Karah, Coffin, Millard F.: STRAIN ACCOMMODATION ALONG THE MACQUARIE RIDGE COMPLEX: TRANSITION FROM TRANSTENSION TO TRANSPRESSION ALONG AN ACTIVE PLATE BOUNDARY [2202]

11:30 AM Williams, Michael L.*, Hanmer, Simon, Baldwin, Julia A.: TECTONIC JUXTAPOSITION AND TRANSCURRENT FAULTING IN THE DEEP CRUST, THE STRIDING-ATHABASCA AREA, NORTHERN SASKATCHEWAN [2630]

11:50 AM Solar, Gary S.*, Tomascak, Paul B.: IS THERE A RELATION BETWEEN TRANSPRESSIVE DEFORMATION AND PLUTON EMPLACEMENT IN SOUTHERN MAINE? [2473]

SESSION NO. 5

T4. Deformation, Metamorphism, and Melting: Interactions in the Crust I

10:45 AM, Sheraton Burlington, Emerald Salon II

Tracy Rushmer, Gayle C. Gleason, and Michael Brown, Presiding

10:45 AM Introductory Remarks

10:50 AM Brown, Michael*, Solar, Gary S.: PROCESSES THAT LINK FERTILE PROTOLITH, MELT-DEPLETED CRUST AND PERALUMINOUS GRANITE [1940]

11:10 AM Marchildon, Nathalie*, Brown, Michael: MELT SEGREGATION AND DEFORMATION INTERACTIONS IN CRUSTAL ROCKS: CONSTRAINTS FROM MIGMATITES IN THREE CONTACT AUREOLES, MAINE, USA [2192]

11:30 AM Barnes, C. G.*, Yoshinobu, A., Prestvik, T., Nordgulen, O.: MIGMATIZATION ASSOCIATED WITH EMPLACEMENT OF MAFIC PLUTONS, HELGELAND NAPPE COMPLEX, NORWEGIAN CALEDONIDES [2204]

11:50 AM Rushmer, Tracy*, Antignano IV, Angelo, Brearley, Adrian J.: GEOCHEMICAL SIGNATURES OF RAPID MELT SEGREGATION IN THE CRUST [2300]

SESSION NO. 6

T8. Paleoecology and Paleobiology of Oxygen Controlled Faunas (Sponsored by Paleontological Society)

8:30 AM, Sheraton Burlington, Emerald Salon II

Christopher McRoberts, and David Lehmann, Presiding

8:30 AM Vacco, David A.*, Sheldon, Amy L., Over, D. Jeffrey: GEOCHEMISTRY OF A MODERN ANOXIC ENVIRONMENT AND IMPLICATIONS FOR ANCIENT ANOXIC ENVIRONMENTS [2688]

8:50 AM Lehmann, David F.*: DYSOXIA AND HIGH SEDIMENTATION RATE: A BAD COMBINATION DURING THE LATE ORDOVICIAN [2550]

9:10 AM Harnik, Paul G.*, Brett, Carlton E., Ross, Robert M.: MIDDLE PALEOZOIC DYSOXIC FAUNAS AND ECOLOGICAL-EVOLUTIONARY TURNOVER EVENTS: A MIDDLE DEVONIAN CASE STUDY [2317]

9:30 AM Leckie, R. Mark*, Bralower, Timothy, Cashman, Richard: OCEANIC ANOXIC EVENTS AND PLANKTON EVOLUTION: EXPLORING BIOCOMPLEXITY IN THE MID-CRETACEOUS [2796]

9:50 AM McRoberts, Christopher A.*: PALEOBIOLOGY OF THE TRIASSIC "FLAT CLAM" HALOBIA IN OXYGEN-DEFICIENT MARINE FACIES [2514]

SESSION NO. 7

T10. Undergraduate Research I (Sponsored by Geology Division, Council on Undergraduate Research) (Posters)

8:30 AM, Sheraton Burlington, Lake Champlain Exhibition Hall

Authors will be present from 9 to 11 AM

Booth #

7 Green, Jeremiah S.*, Chamberlain, Steven C., Robinson, George W., Bailey, David G.: REDISCOVERY OF THE CLASSIC LOCALITY FOR 'GIESECKITE' NEAR NATURAL BRIDGE, LEWIS COUNTY, NEW YORK [2766]

8 Estelle, Todd*, Gorring, Matthew: GEOCHEMISTRY OF MIDDLE PROTEROZOIC MOUNT EVE GRANITES FROM THE NJ/HUDSON HIGHLANDS: A-TYPE GRANITES RELATED TO POST-OROGENIC COLLAPSE? [2857]

9 Priest, Jess*, Coron, Cynthia R., Fleming, Thomas H.: ORIGIN OF BASALT BRECCIAS IN THE FAIRHAVEN DIKE SYSTEM, WALLINGFORD, CT [2841]

10 Sonzogni, Blair*, Gorring, Matthew, Gates, Alexander E., Valentino, David: MIDDLE PROTEROZOIC A-TYPE GRANITE PLUTONISM IN THE WESTERN HUDSON HIGHLANDS, NEW YORK [2840]

11 Trotter, Amanda E.*, Brady, John B.: SYENITIC COMPOSITE DIKES AT CAT COVE, SALEM, MASSACHUSETTS [2816]

12 Hall, Sarah R.*: PETROGENESIS OF XENOLITHS IN MIOCENE BASALTS OF NORTHEASTERN OREGON [2746]

13 Wilson, Sharon A.*, Coish, Raymond A.: GEOCHEMICAL ANALYSIS OF SILURO-DEVONIAN MAFIC DIKES IN EAST-CENTRAL VERMONT [2414]

14 Able, Lindsey M.*, Brady, John B.: LAWSONITE PSEUDOMORPHS IN THE SCHISTS OF SYROS, GREECE [2698]

15 Arsenault, Michelle, Brady, John B.: CALC-SILICATE MARBLES OF SYROS, GREECE [2711]

16 Richard, Jill E.*, Markley, Michelle J.: ORIGIN OF BLUESCHIST BRECCIA, SYROS, GREECE [2785]

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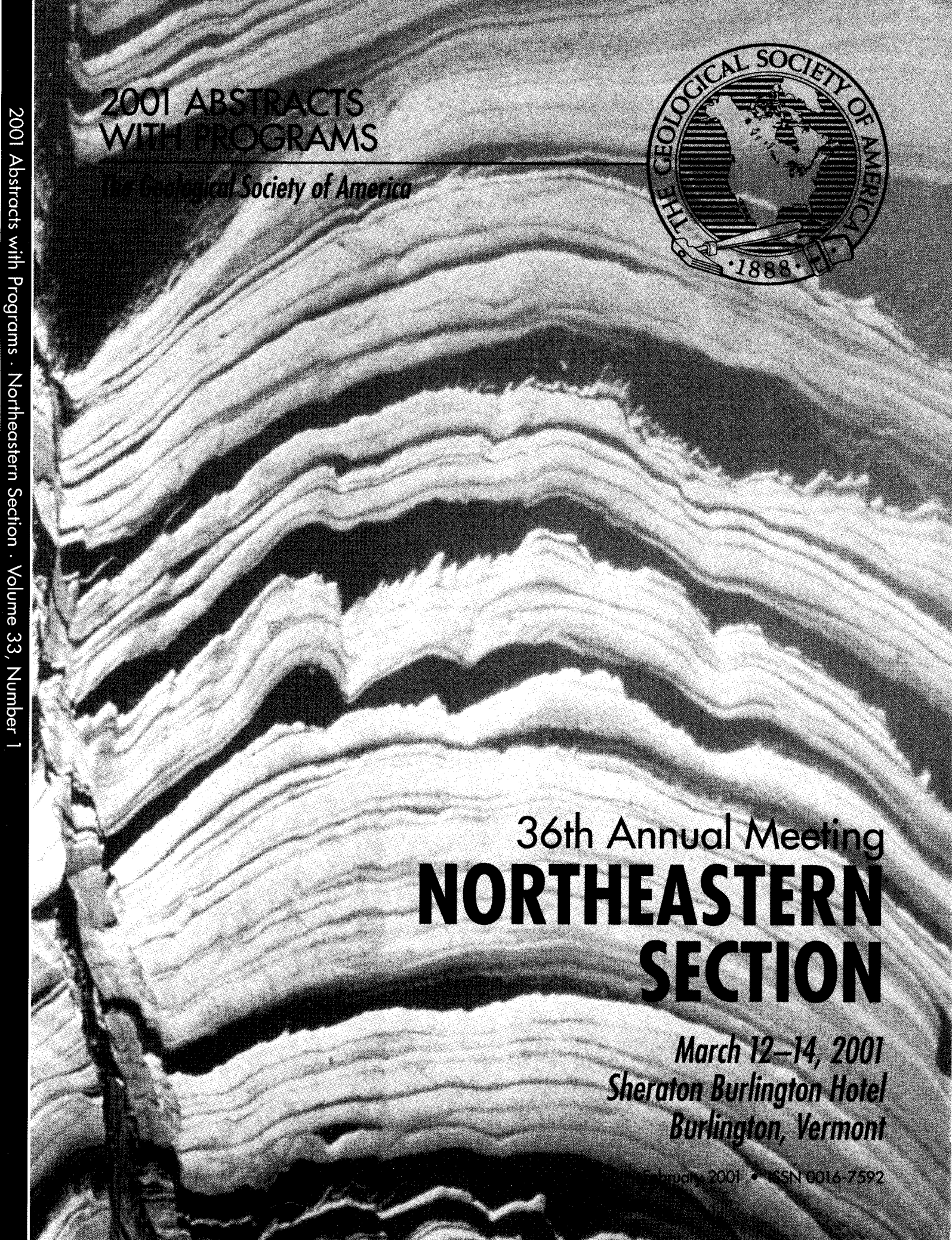

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