

# ABSTRACT FORM FOR ALL GSA MEETINGS IN 1995

Complete all sections ① through ⑨ below.

① TYPE ABSTRACT COMPLETELY WITHIN THE BLUE LINES BELOW. (10 point type minimum)

No 10268

PLEASE DO NOT WRITE IN THESE SPACES

## GEOLOGIC TEST OF WEATHERING ZONE CONCEPT AND NUNATAK HYPOTHESIS USING COSMOGENIC ISOTOPE DATING IN PANGNIRTUNG FJORD AREA, BAFFIN ISLAND, NUNAVUT TERRITORY, CANADA

MARSELLA, K.A. Dept. Geology, Univ. Vermont, Burlington, VT 05405; DAVIS, P.T., Dept. Nat. Sci., Bentley Coll., Waltham, MA 02154; BIERMAN, P.R. Dept. Geology, Univ. Vermont, Burlington, VT 05405; Finkel, R.C., Caffee, M.W., and Southon, J.R., Lawrence Livermore Nat. Lab., Livermore, CA 94550

The weathering zone concept assumes that the degree of weathering on boulder and bedrock surfaces is a function of exposure time since deglaciation. The altitudinally highest weathering zone is believed by some to have remained ice-free as nunataks. Dyke (1979) mapped a large area on southern Cumberland Peninsula and defined two major weathering zones, separated by the Duval moraines that he believes date 60-80 ka. Some lake sediment cores stratigraphically above the Duval moraines in hanging valleys above the Kolik River valley yield  $^{14}\text{C}$  ages of 18-20 ka (Wolfe, 1994, 1995, in press). However, sediment cores from Tasikutaaq Lake (Lemmen *et al.*, 1988) provide minimum-limiting ages of only about 8 ka, suggesting that the Kolik River valley was perhaps glaciated during the late Wisconsinan.

Because of the apparent discrepancy in these indirect dating methods, we are using cosmogenic isotopes for directly dating exposure ages for boulder and bedrock surfaces. We are dating samples stratigraphically below, upon, and above the Duval moraines. Using production rates of Nishiizumi *et al.* (1989), bedrock samples adjacent to Tasikutaaq Lake yielded concordant  $^{26}\text{Al}$  and  $^{10}\text{Be}$  ages of  $12.0 \pm 2.7$  ka and  $12.3 \pm 2.9$  ka, suggesting a late Wisconsinan ice cover. Molded, polished, and striated bedrock and unweathered boulders in the Ukaliq Lake valley may suggest that the area was also glaciated during the late Wisconsinan, so samples were collected for  $^{26}\text{Al}$  and  $^{10}\text{Be}$  analyses. A tor sampled in the upper weathering zone (about 1000 m a.s.l.) yielded a minimum  $^{26}\text{Al}$  age of  $42.2 \pm 9.4$  ka and a minimum  $^{10}\text{Be}$  age of  $59.6 \pm 12.6$  ka, suggesting that perhaps the highest areas were nunataks during the late Wisconsinan. However, the Duval moraines may be late Wisconsinan, rather than early Wisconsinan, in age.

Besides detailed field mapping, another 50 samples from large boulders and striated or polished bedrock are being analyzed for  $^{26}\text{Al}$  and  $^{10}\text{Be}$ , to further assess the age of the Duval moraines, delimit ice extent, and test the weathering zone concept and nunatak hypothesis.

② CHECK ONE DISCIPLINE (category) below in which reviewers will be best qualified to evaluate your abstract.

- 1 archaeological geology
- 2 coal geology
- 3 computers
- 4 economic geology
- 5 engineering geology
- 6 environmental geology
- 7 geochemistry, aqueous/organic
- 8 geochemistry, other
- 9 geology education
- 10 geophysics/ tectonophysics
- 11 geoscience information
- 12 history of geology
- 13 hydrogeology
- 14 marine geology
- 15 micropaleontology
- 16 mineralogy/ crystallography
- 17 paleoceanography/ paleoclimatology
- 18 paleontology/ paleobotany
- 19 petroleum geology
- 20 petrology, experimental
- 21 petrology, igneous
- 22 petrology, metamorphic
- 23 planetary geology
- 24 Precambrian geology
- 25 Quaternary geology/ geomorphology
- 26 remote sensing
- 27 sediments, carbonates
- 28 sediments, clastic
- 29 stratigraphy
- 30 structural geology
- 31 tectonics
- 32 volcanology

### ③ SELECT ONE FORMAT

\_\_\_ INVITED FOR SYMPOSIUM NUMBER: \_\_\_\_\_

(first five words of Symposium title)

\_\_\_ VOLUNTEERED FOR DISCIPLINE SESSION

\_\_\_ VOLUNTEERED FOR THEME SESSION NUMBER: \_\_\_\_\_

(first five words of Theme Session title)

### ④ SELECT ONE MODE

(Be aware that some theme sessions may have been designated specifically as either "poster" or "oral.")

\_\_\_ ORAL—Verbal presentation before a seated audience.

\* POSTER—Graphic display on poster boards supplemented by speaker comments.

\_\_\_ EITHER—Either mode is acceptable.

side-by-side w/ No. 10268, if possible

### ⑤ CHECK IF THIS APPLIES

\_\_\_ WITHDRAW—If the abstract cannot be accepted in the mode I have indicated, please withdraw it.

\_\_\_ STUDENT AUTHOR—(for Section meetings only)

Please check here if the presenter is a student author.

⑥ % OF THIS PAPER PREVIOUSLY PRESENTED 0% \_\_\_\_\_

WHERE? \_\_\_\_\_

WHEN? \_\_\_\_\_

### ⑦ CHECK IF YOU ARE WILLING TO BE A SESSION CHAIR \_\_\_\_\_

Your Name \_\_\_\_\_

Office Phone \_\_\_\_\_ Home Phone \_\_\_\_\_

Fax \_\_\_\_\_ E-mail \_\_\_\_\_

### ⑧ SPEAKER'S IDENTITY AND MAILING ADDRESS—PLEASE TYPE!

Name Kim Marsella

Department Geology

Institution Univ. Vermont

Address Perkins Hall

City/State/ZIP Burlington, VT 05405

Country USA

Office Phone 802-656-4411

Home Phone 802-863-3609

If the speaker will be unavailable at these numbers during the 45 days following the abstract deadline, list phone numbers to be used instead.

Office Phone 819-473-8828 (Baffin Is.)

Home Phone \_\_\_\_\_

### ⑨ MAIL ORIGINAL + 8 COPIES TO:

INVITED-SYMPOSIUM ABSTRACTS: Send directly to your convener by deadline on invitation.

ALL OTHER ABSTRACTS (DISCIPLINE & THEME): Send to the appropriate address (see address box) to arrive before the deadline shown.

Abstracts may NOT be faxed.

1641