Field Trips
BRING LUNCH & drink, Bathrooms few & far between.
In lieu of lab on 19 March lecture
Pick which trip
If you can’t make either one, see me

Sunday
Cheat River including, Muddy Run, the 1840s Virginia Iron Furnace, Albright in the record 1985 flood, and large boulder transport in the Cheat Narrows.
Blackwater Falls?
Short-distance hiking on steep bouldery terrain.
Departure 9:00 return by 6:00 p.m.

Cacapon Mountain - Saturday
2 hours 15 minutes from White Hall
~ some hiking on gentle-smooth & rugged-bouldery terrain.
working trip: downloading data loggers & numerous measurements.
Departure 9:00 a.m. and return about 6:00 p.m., may be later if science takes longer
Dress for the weather (Berkeley Springs, WV) for at least 4 hours conducting field work.
Trivial "extra credit" for attending both trips
Periglacial (Cryogenic) Geomorphology

Gelifluction, Cryoturbation

vs.

Glacial, Proglacial, Paraglacial

Circum-Arctic Map of Permafrost and Ground Ice in EASE-Grid format

http://nsidc.org/NOAA/caps_ftp_documentation.html
National Snow and Ice Data Center. 1999.
Digital data available from nsidc@kryos.colorado.edu.
NSIDC Distributed Active Archive Center, University of Colorado at Boulder.
Northern Hemisphere Permafrost Distribution
National Snow & Ice Data Center, 1999

http://nsidc.org/NOAA/caps_ftp_documentation.html

Legend for EASE-Grid Permafrost and Ground Ice Map

<table>
<thead>
<tr>
<th>Permafrost Status</th>
<th>Northern Hemisphere Distribution</th>
<th>Mean Temperature Profiles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current (40-60%)</td>
<td>Hard (0-10%)</td>
<td>-0°C</td>
</tr>
<tr>
<td>Low (0-10%)</td>
<td>Medium (10-30%)</td>
<td>+0°C</td>
</tr>
<tr>
<td>High (30-50%)</td>
<td>High (50-70%)</td>
<td>Mean</td>
</tr>
<tr>
<td>Isolated (5-15%)</td>
<td>Low (2-25%)</td>
<td>Winter</td>
</tr>
</tbody>
</table>

Temperature Profiles

-0°C +

Active zone

Permafrost

Mean

Winter

Summer

Talik
Temperature Profiles
- 0°C +

- Permafrost
- Aquiclude
- Talik

Summer

Ice Dynamics

Isotherms

H2O Flux

Ice Dynamics

Isotherms
Mechanism for Sorted Polygons

1. Surface in Summer

Cobbles

2. Surface in Winter

Isotherms
Mechanism for Sorted Polygons

Ice Wedges Form in Winter

3. Surface in “Next” Summer

4. Surface in “Next” Winter
Mechanism for Sorted Polygons

4. Surface in “Next” Winter

Mechanism for Sorted Polygons

5. Surface in “Next” Summer

Mechanism for Sorted Polygons

6. Surface in “Next” Winter
Mechanism for Sorted Polygons

6. Surface in “Next” Winter

Mechanism for Sorted Polygons

7. Surface in “Next” Summer

Cross-Section of Sorted Polygons

Gelifluction, Cryoturbatuion
Late-Pleistocene sand wedges (tan) in massive icy sediments (gray); Holocene ice wedge (white), Summer Is., Mackenzie Delta region, NWT, Canada

Used with permission of H. French


Active Ice Wedge, Prudhoe Bay, AK

Photo by R.D. Reger

Alaska Division of Geological & Geophysical Surveys

http://wwwdggs.dnr.state.ak.us/photogallery.html
Ice-wedge Polygons & Thermokarst Ponds in Peatlands, Hudson Bay Lowlands, Manitoba

Photo by Lynda Dredge, GSC
sts.gsc.nrcan.gc.ca/tsdweb/landscapes/photo_details.asp?numero=489

Sorted Polygons Formed in Till, Bernard Harbour, Nunavut

Photo by Isabelle McMartin, GSC

Ice-wedge polygons in peat & frost-shattered bedrock, Seal River, Northern Manitoba

Lynda Dredge, GSC photo
sts.gsc.nrcan.gc.ca/tsdweb/landscapes/photo_details.asp?numero=484
Stone Nets near Point May, Burin Peninsula, Newfoundland

Rectangular Ice-Wedge Network
Prince Patrick Island, NWT

Concentric Patterned Ground, Prince Patrick Island, NWT
Concentric Polygons
Photo: J. R. Mackay
http://www.gi.alaska.edu/ScienceForum/ASF6/690.html
web site by Larry Gedney,
University of Alaska, Fairbanks

Patterned Ground in Spitsbergen, Svalbard
Photo by Bernard Hallet, U. Washington,
used with Dr. Hallet's permission

Stone Polygons, Cabin Mountain, West Virginia
J.S. Kite Photo
Sorted Polygons & Stone Stripes

“Flat” Terrain

Sloping Terrain

Sloping Terrain

“Flat” Terrain

Sorted Polygons & Stone Stripes

J.S. Kite Graphic

Patterned Ground

Cabin Mountain, West Virginia

Blow Up of Aerial Photo

Stone Stripes Formed on Till, Baffin Island, Nunavut


Photo by Art Dyke, GSC
Boulder Streams

Coarse Stone Stripes

Cryoturbation & Solifluction, Melville Island
Polygons and Circles on Flat Land, Stripes on Slopes

Solifluction Lobe, Jotunheim Mtns., Norway
Photo: S. D. Gurney
Reading Univ.

http://www.rdg.ac.uk/~sgsgurne/gallery.html
Solifluction Lobe, Jotunheim Mtns., Norway
Photo: © Steven Gurney
Reading Univ.

http://www.rdg.ac.uk/~sgsgurne/gallery.html

Solifluction Lobes & Terraces, Gros Morne NP, Newf.


Solifluction Apron, Melville Island, NWT
Ice-Shattered Shale, Eastern Melville Island, NWT

Rock blisters in dolomite, Bernard Harbour area.
photo by Isabelle McMartin, GSC
sts.gsc.nrcan.gc.ca/lsdweb/landscapes/photo_details.asp?numero=212

Pingos, Prince Patrick Island, NWT, Canada
Photo: Unknown, GSC

up to 100 m across
Pingo in Outwash, Bylot Island, NWT

Photo: Ron DiLabio, GSC

Pingo on glacial outwash plain, Bylot Island, NWT.

- Author: Ron DiLabio

Tuk Pingo, NWT

www.worldweb.com
Photo © Northwest Territories Resources, Wildlife and Economic Development
Pingo, GSC Photo

Pingo near Harding River, Nunavut
- photo by Isabelle McMartin, 1989
- 22 m high rock pingo was formed in heavily fractured dolomite

Rock Pingo in Fractured Dolomite, near Harding River, Nunavut

Photo by Isabelle McMartin, GSC, 1989

22 m
Rock Glaciers

- Interstitial Ice
- Ice-Cored

Rock glacier near Tungsten, Northwest Territories.

Photo: Lionel E. Jackson, Jr., GSC