

How Did Those Rocks Get Up There? Exploring Two Proposed Russian Impact Lakes

Dallas Abbott-Lamont-Doherty

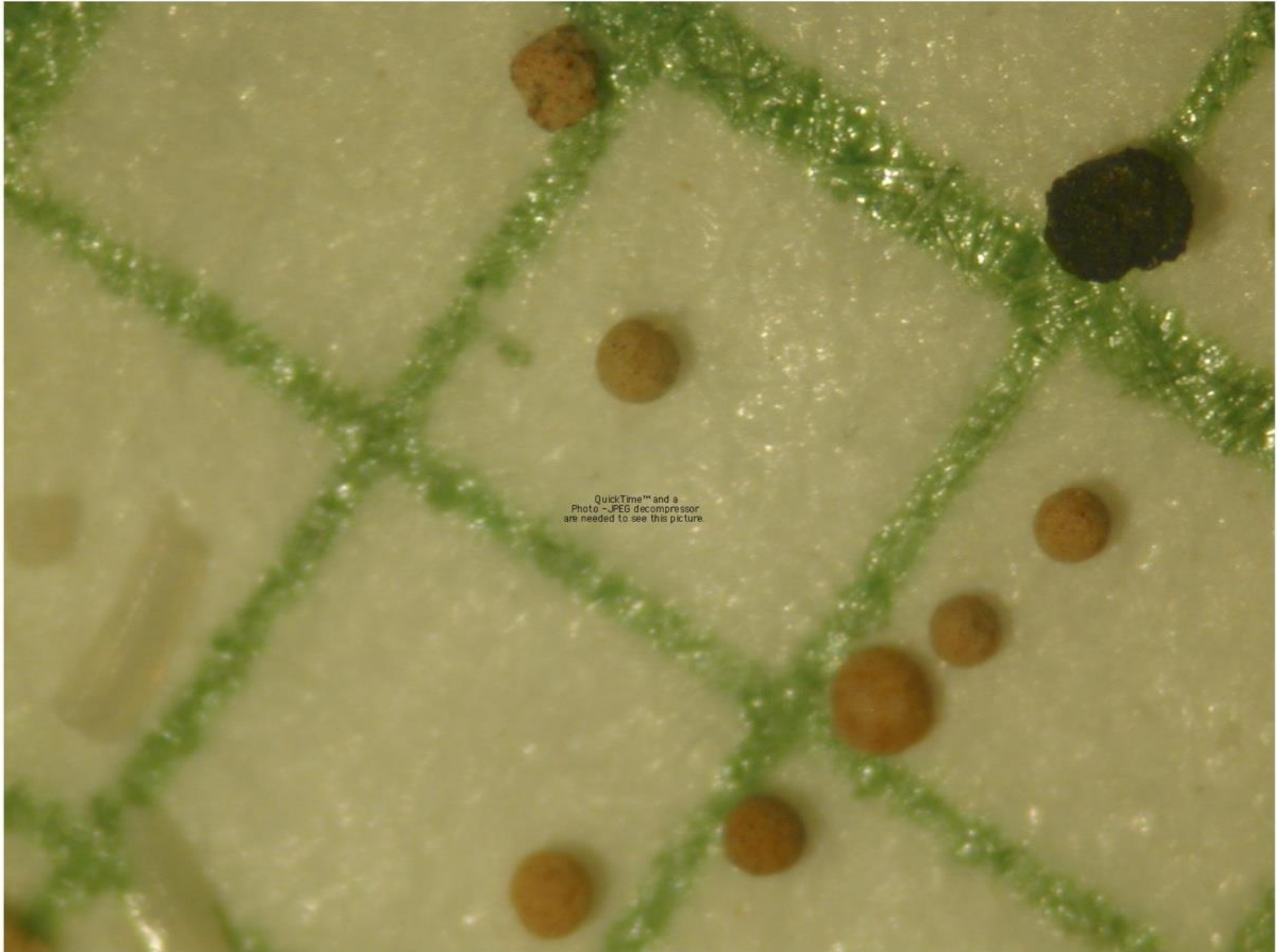
Dee Breger-Micrographic Arts

Viacheslav Gusiakov and Ivan Amelin-Siberian
Branch RAS, Novosibirsk

Alexei Kiselev-Univ. Mininskogo

Vadim Bronguleev, Sasha Makkaveav, Vadim
Karaveav-Inst. of Geography, Moscow

Typical dust on graph paper squares



Sources of Impacts



Comet-Dirty ice ball
Black body-only
visible near sun



Asteroid-rock
Appears as a
small star.

Importance of Ni- Abundant in Material from Outer Space(Example: Iron Meteorite-5-13% Ni)



Lake Smerdyachee, Svetloyar locations



Earlier Evidence- glass bead breccia w/glass



Kashkarov et al, 2005

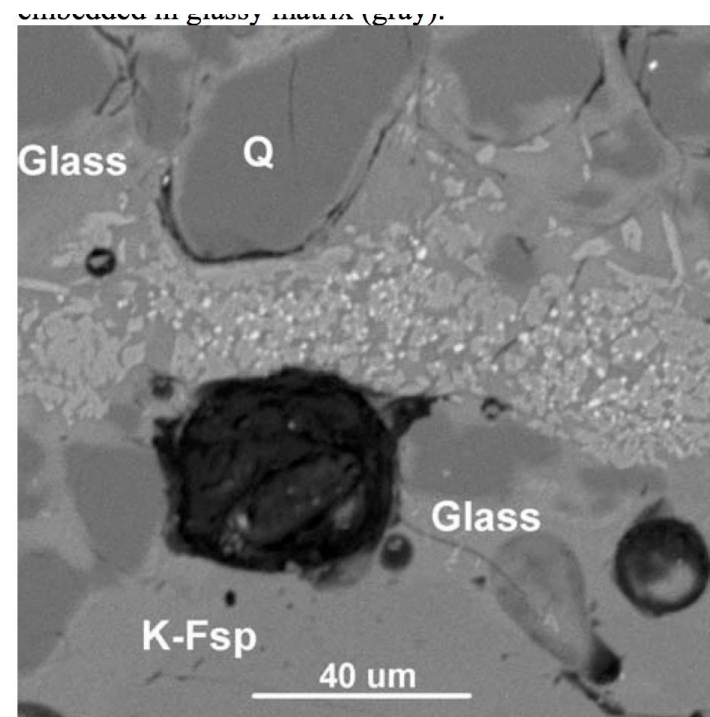


Fig. 3 BSE image of the matrix of possible impactite. Oxide (white) and pyroxene (light gray) crystals are embedded in the matrix glass (center and right).

Badukov et al., 2003

Road to Smerdyachee Lake



Smerdyachee-proposed impact lake- ~300 meters diameter



Why Impact? Deep, Round Lake with a Raised Rim



2014 Field Party at Lake Smerdyachee



Setting up a tent



Campfire at night



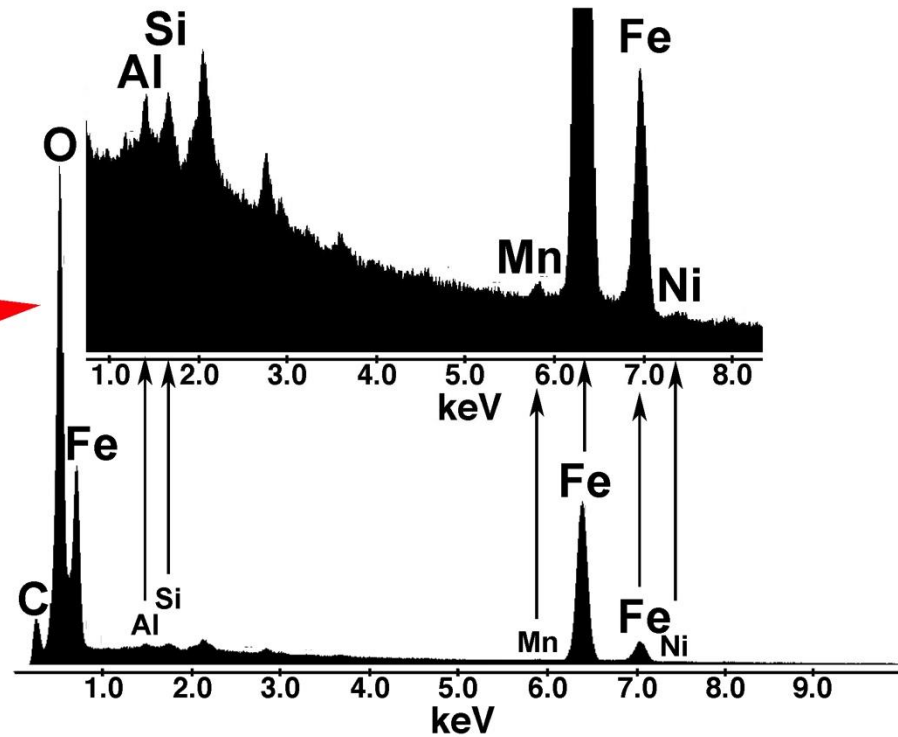
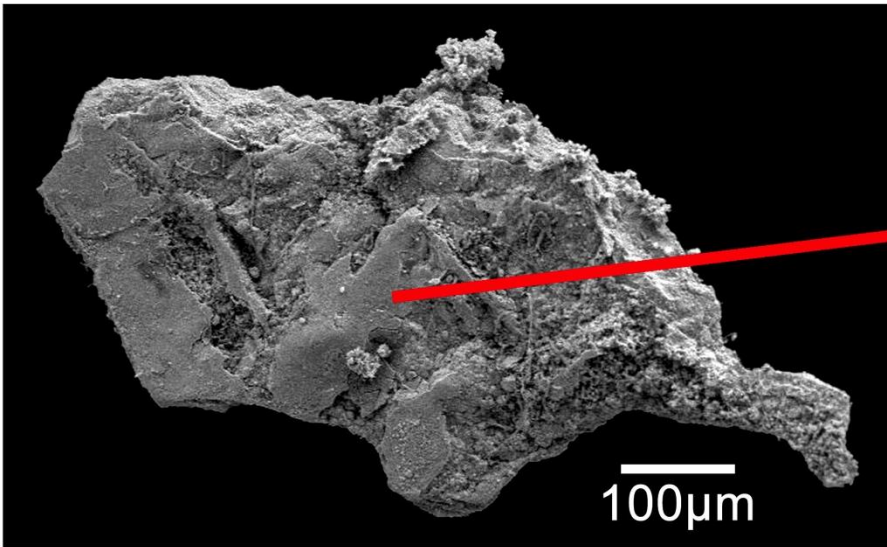
Moon and tent



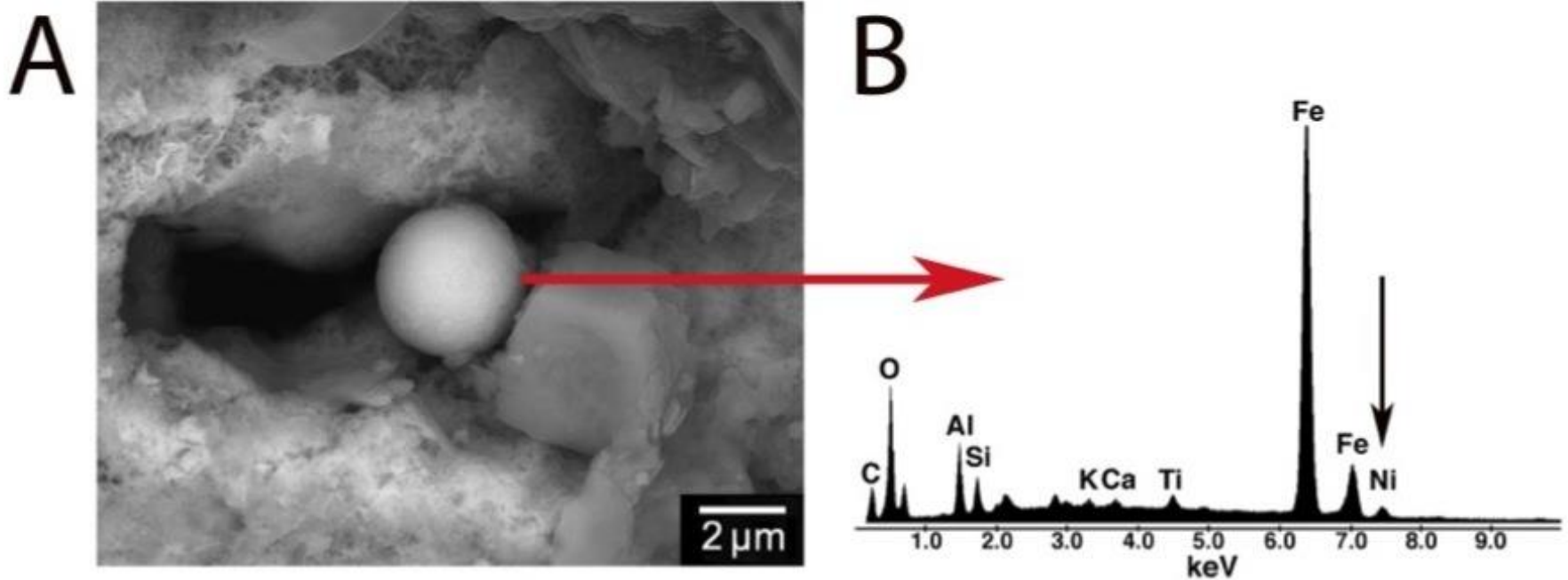
Birches at Smerdyachee



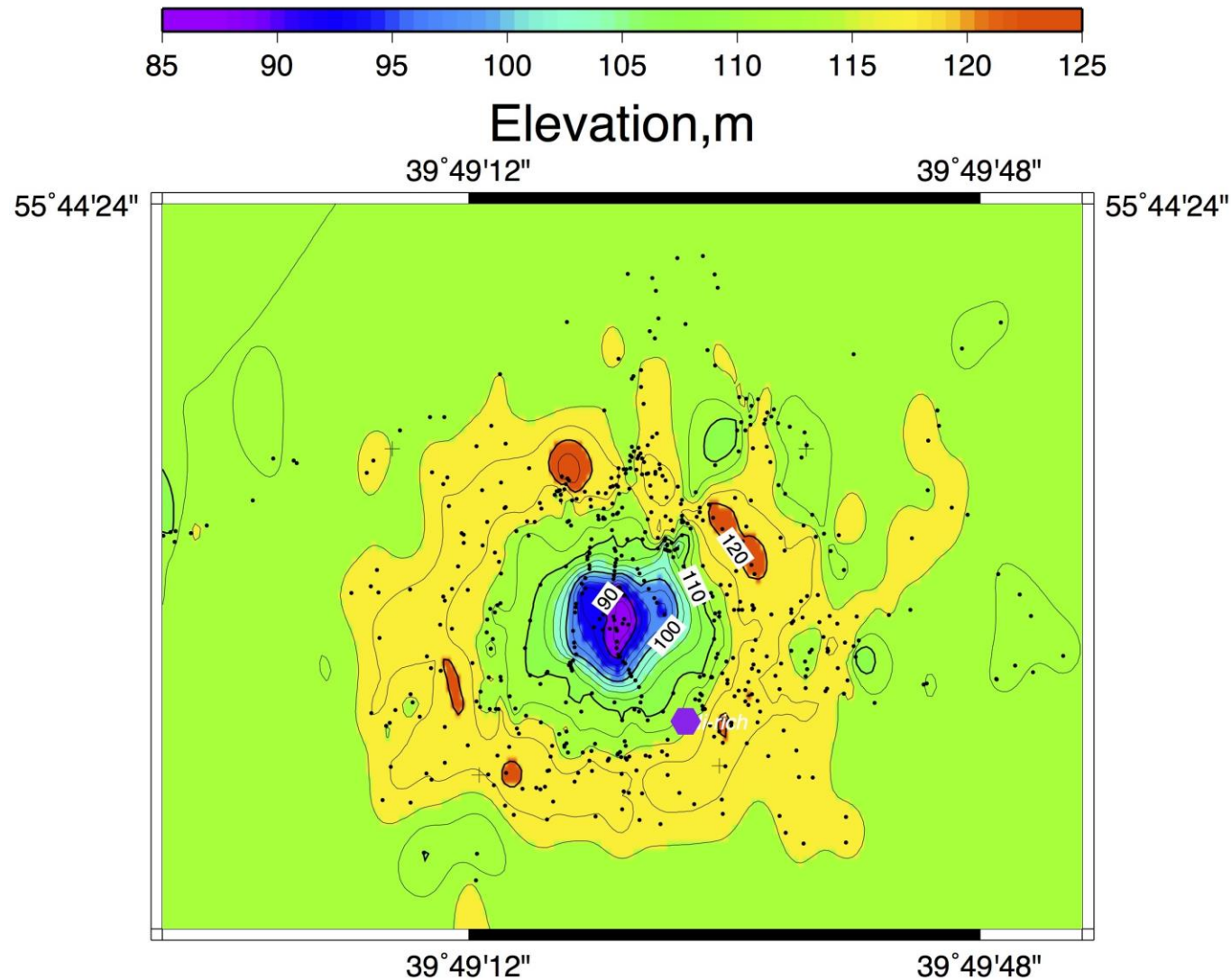
2013 season-first Ni rich material Smerdyachee



Ni rich material 2013- Smerdyachee



Topography 2014 (water at 114 m)



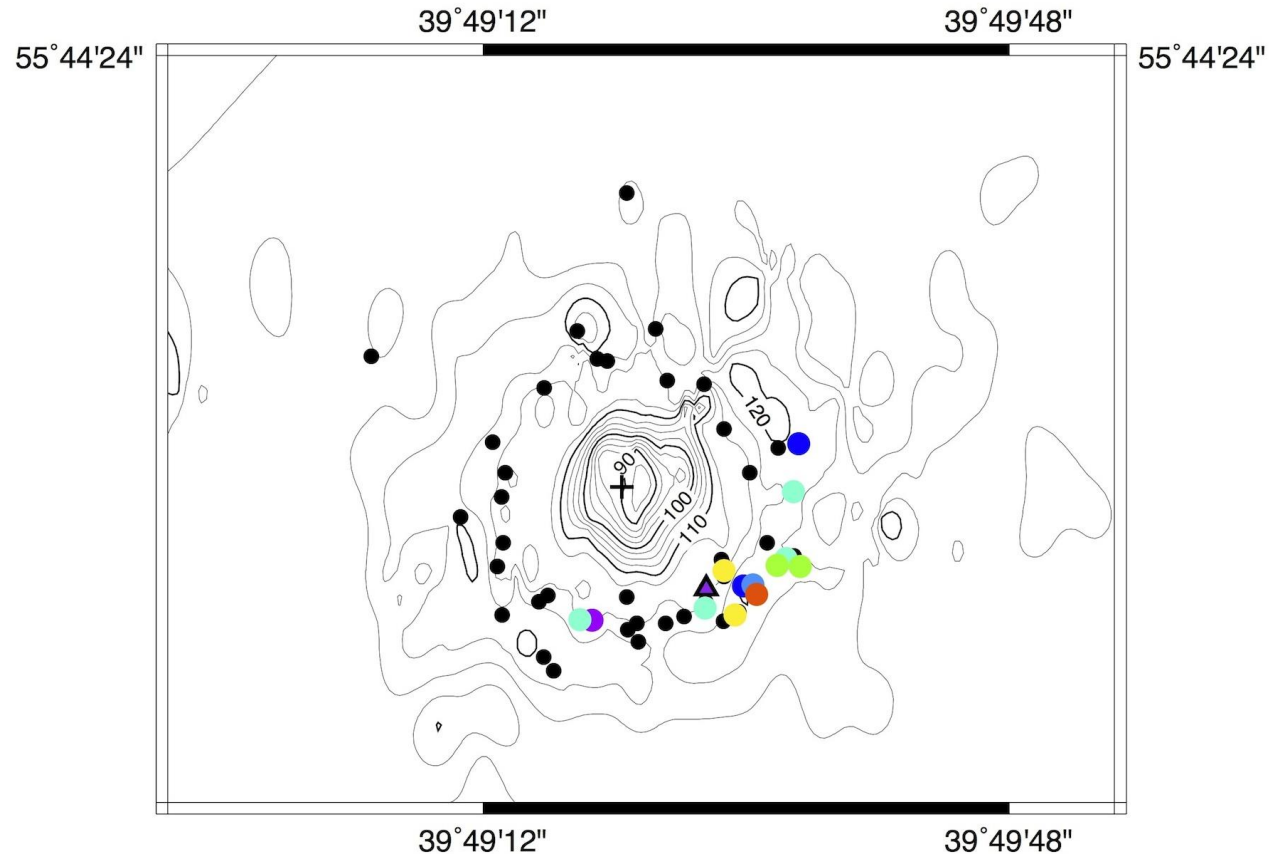
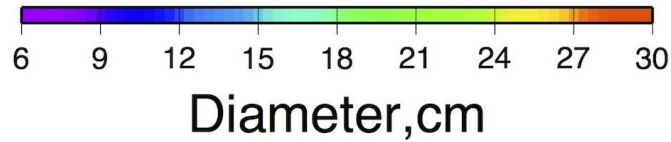
2013-2014 season-many carbonate rocks in soil-only on one part of rim



Example larger carbonate rock



Large rock fragments containing Paleozoic fossils



Mississippian fossils- from rocks at > 40 m depth-unlithified alluvium above



Crinoid stem

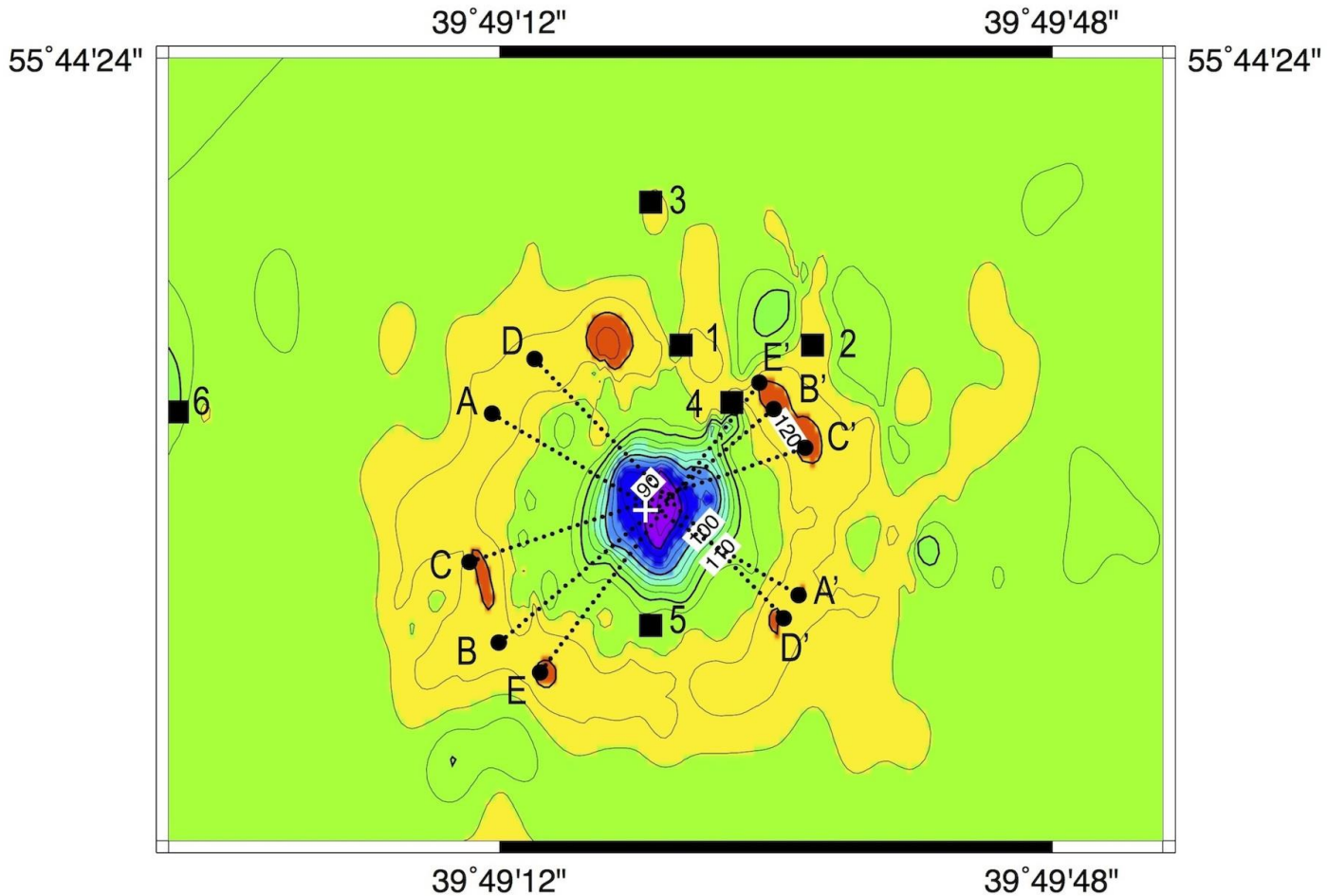
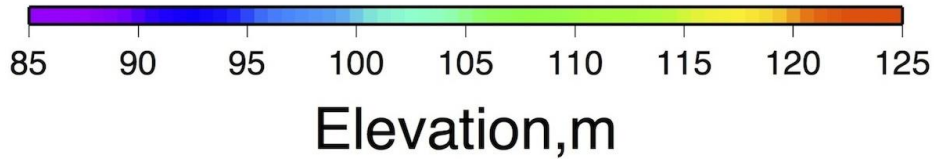


Brachiopod

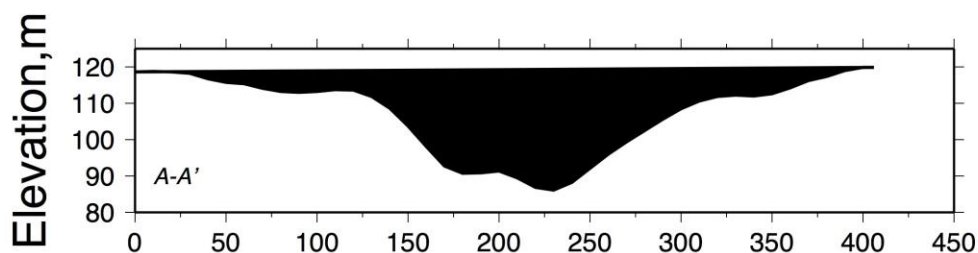
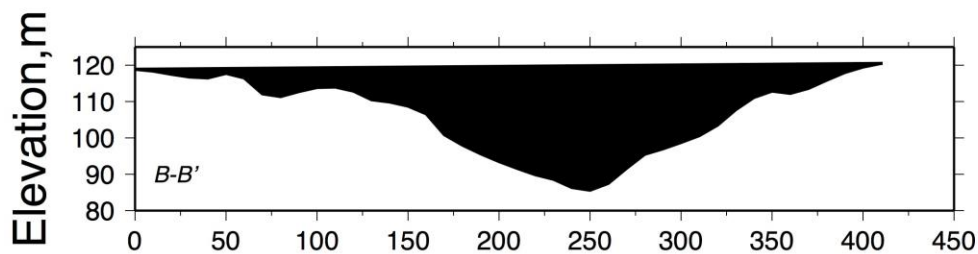
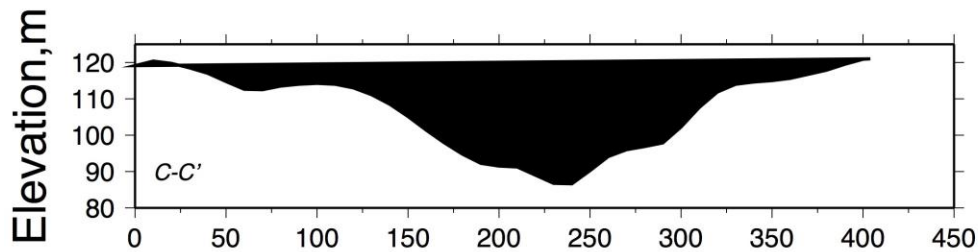
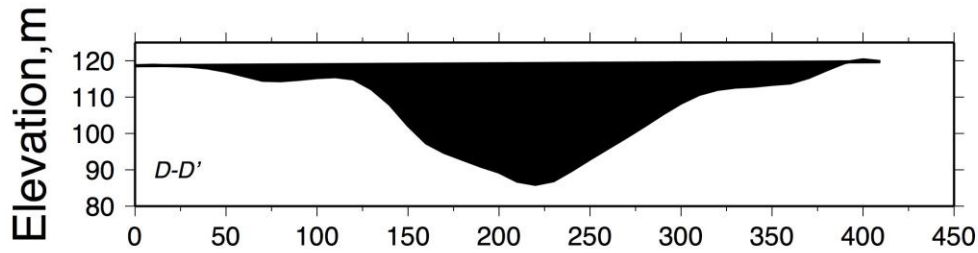
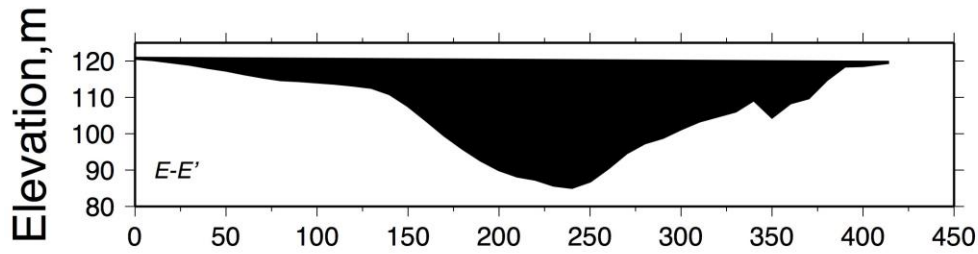
Breccia-black not glass-carbonate



Cross Section Map

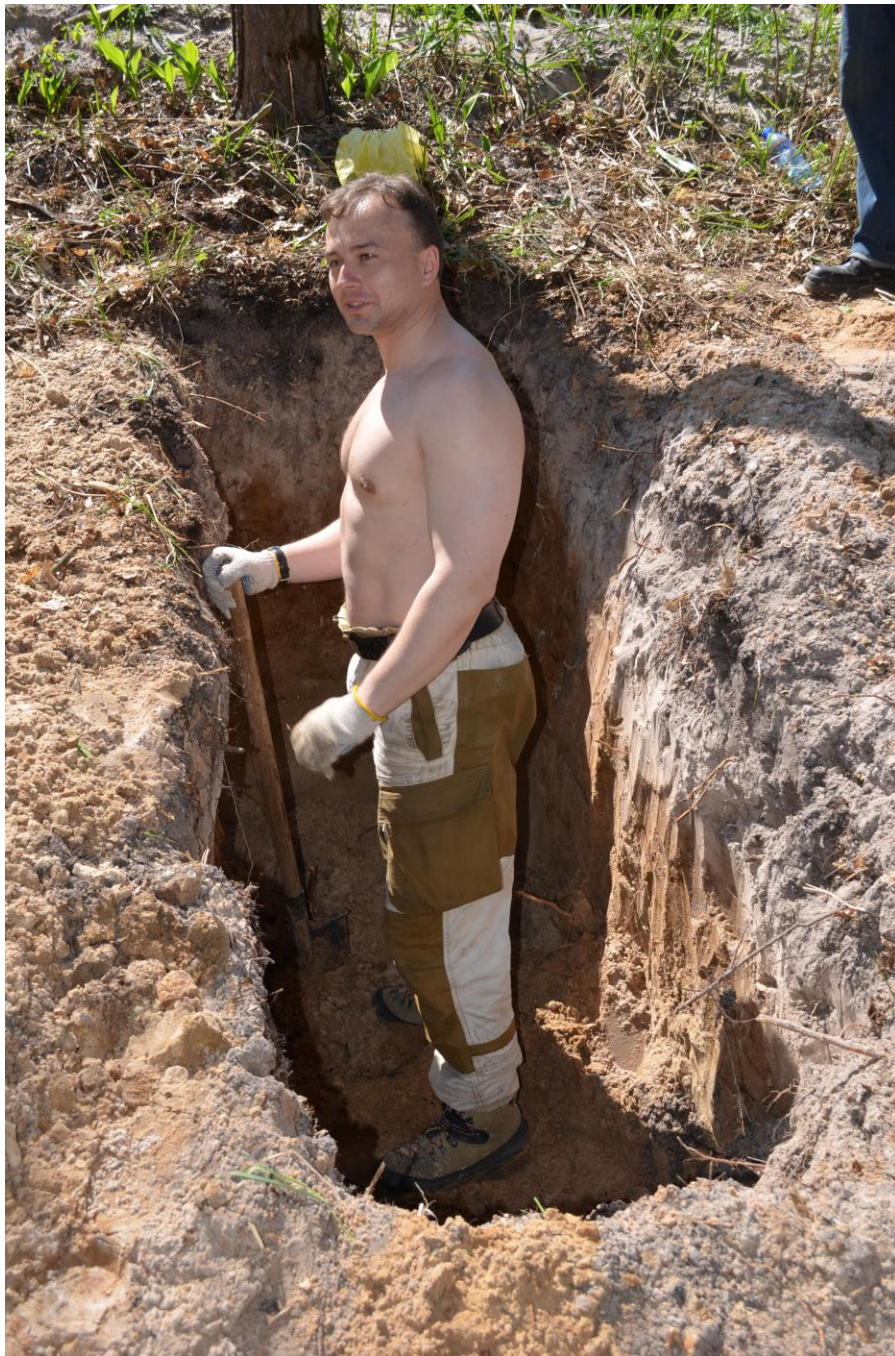


Cross Sections Lake Smerdyachee



Distance,m

Vadim
measuring
hole-
abnormal soil
profile near
lake



Distal ejecta layer on river bank? 2014 discovery



Dmitri from Kola peninsula-may drill lake



Lake Smerdyachee, Svetloyar locations



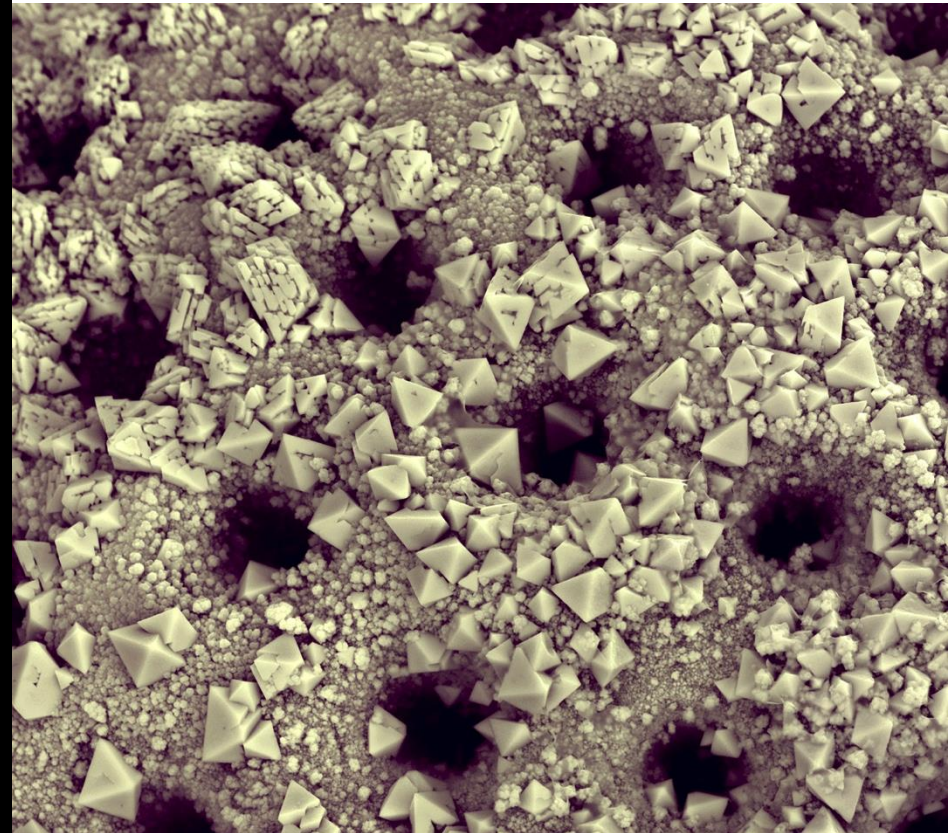
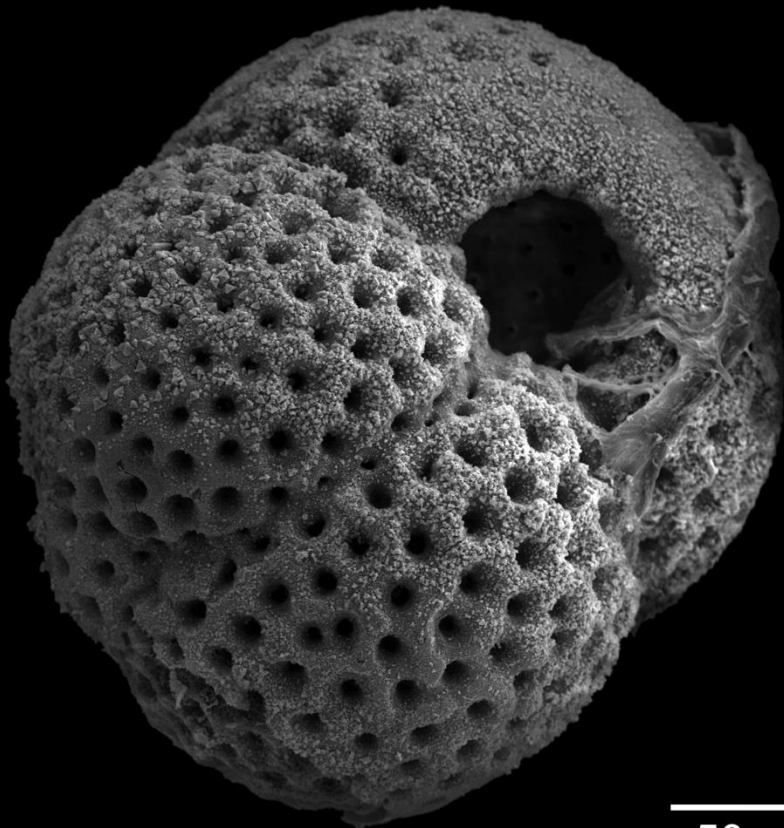
Lake Svetloyar



Invisible Town of Kitezh “Russian Atlantis” by Konstatin Gorbатов



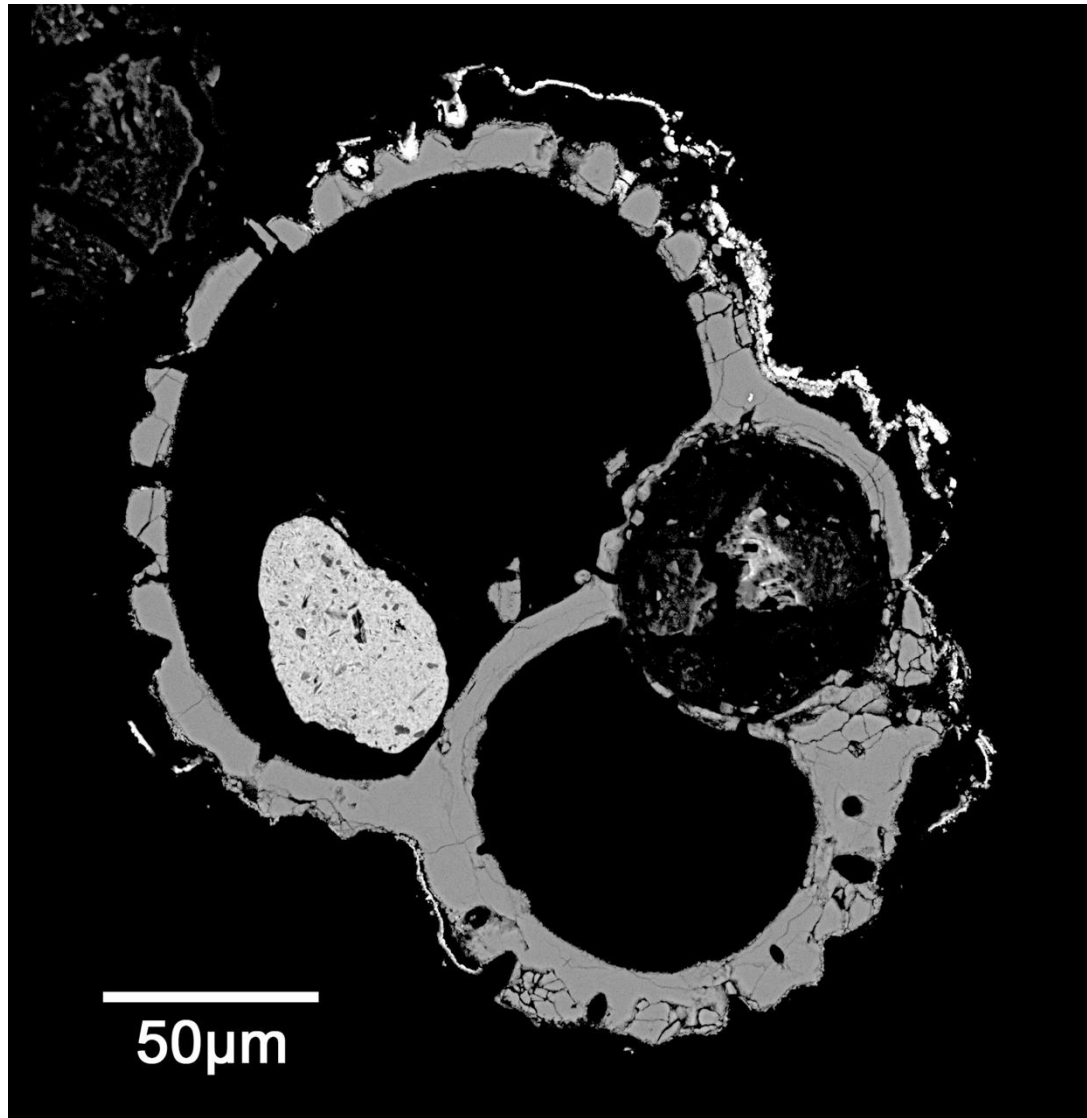
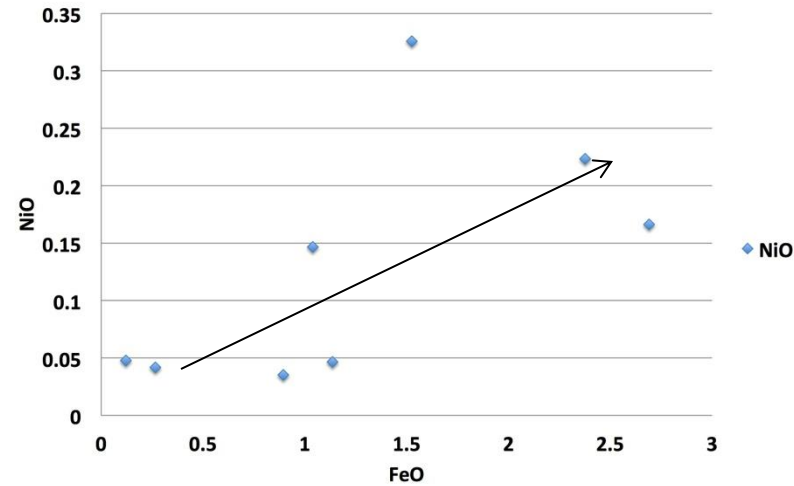
**Tin Oxide Crystals on Marine
Foraminifer (32 km N. of NY Harbor)-
Tin contains nickel
~1159 B.C. time of climate downturn**



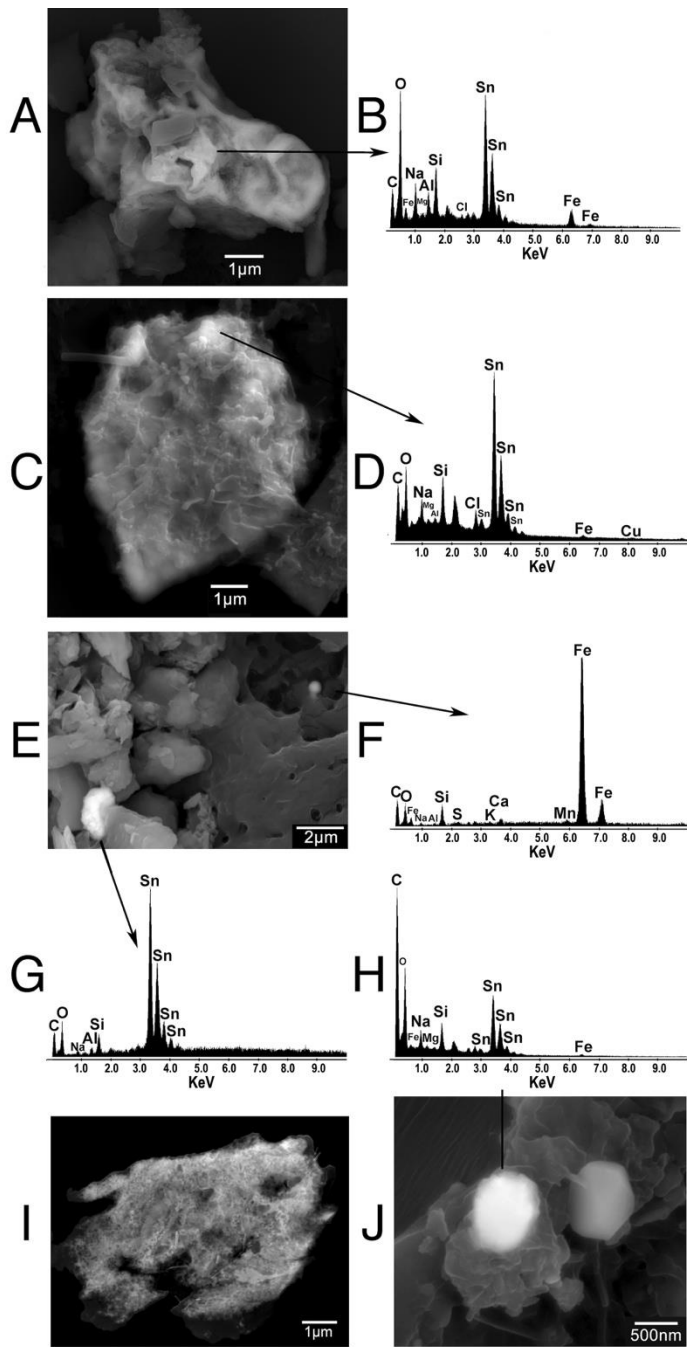
Same Sn covered foraminifer-thin section- circa B.C. 1159 (CD02-13: 307-309 cm depth)

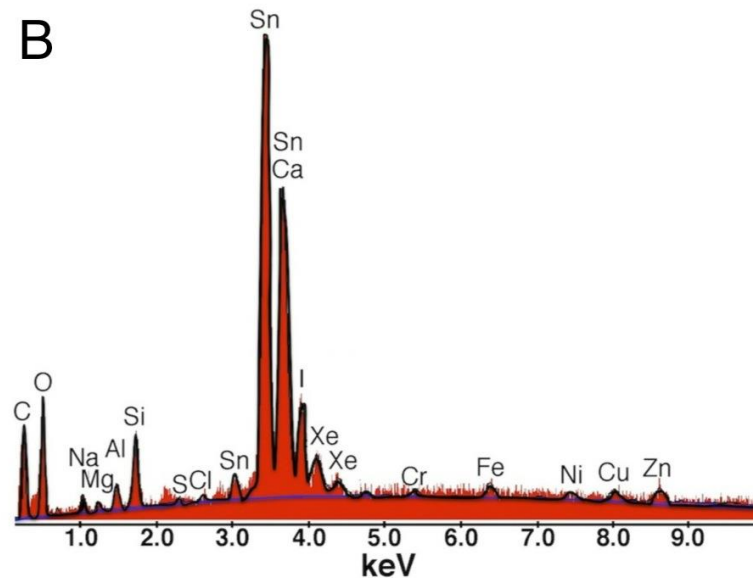
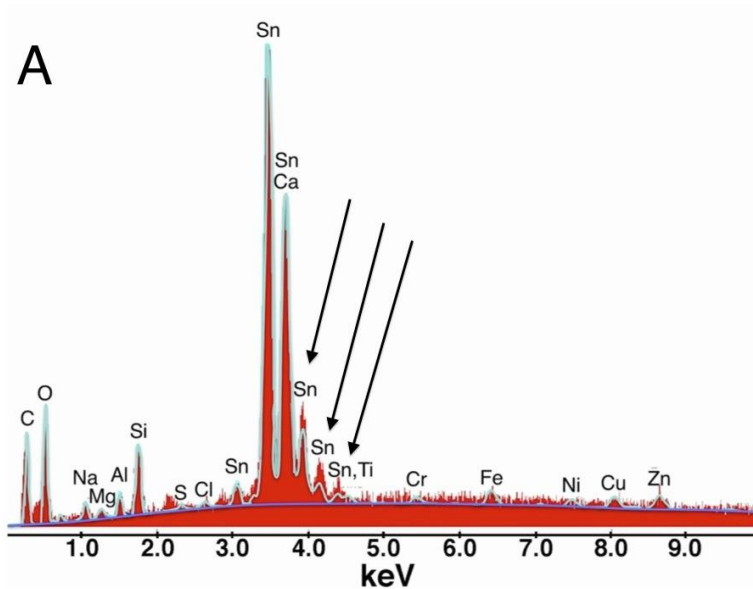
Microprobe Result
Higher Ni = Higher Fe

Ni and Fe in Sn coating of Foram- CD02-13 308 cm



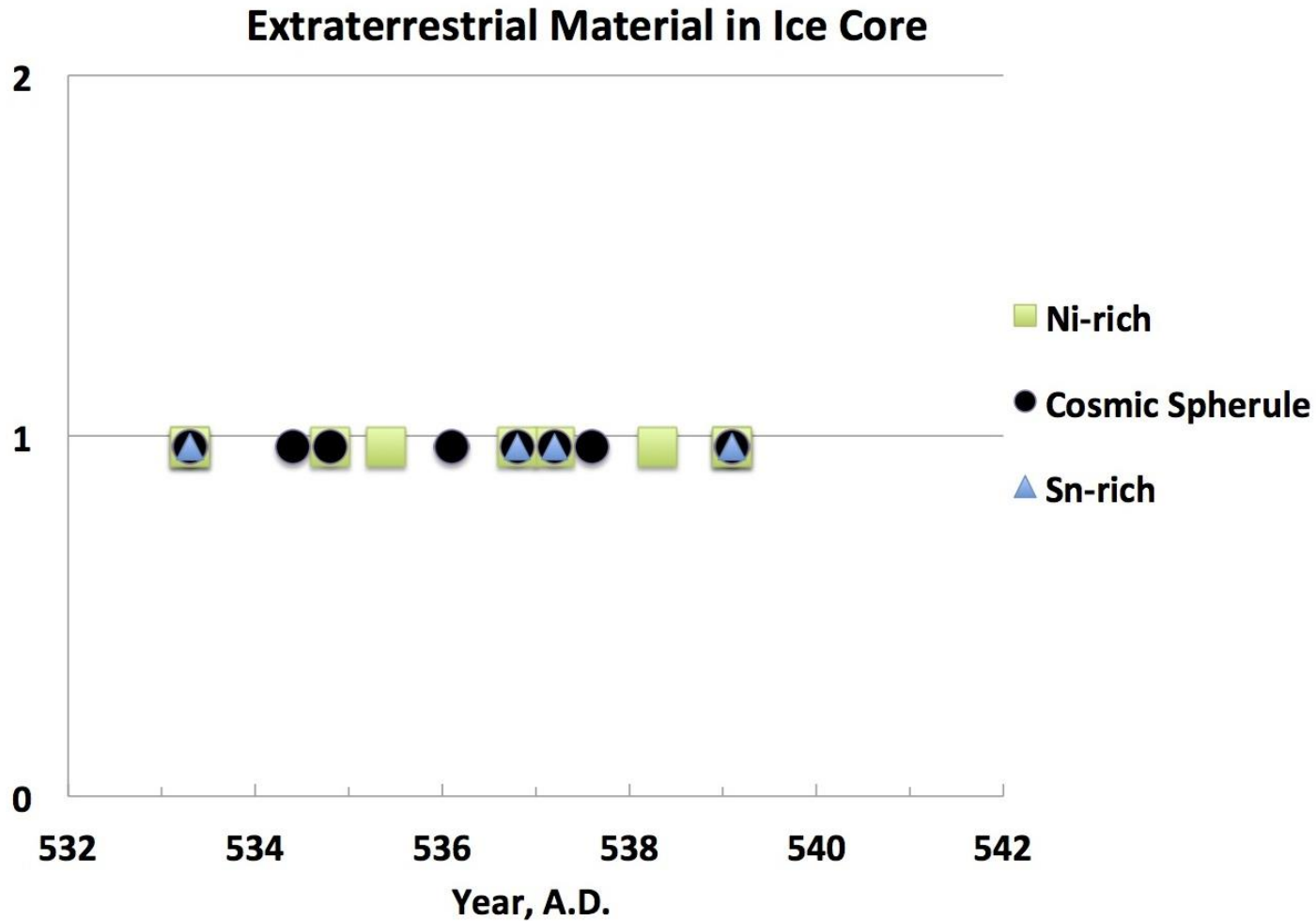
Tiny bits of Sn in ice core



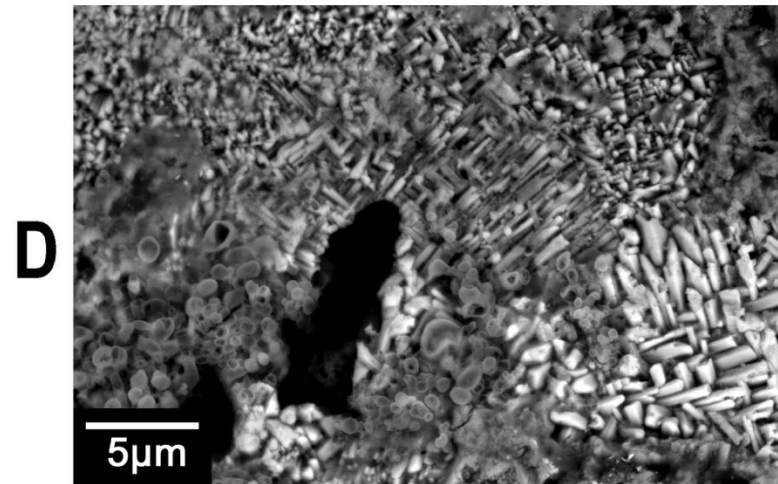
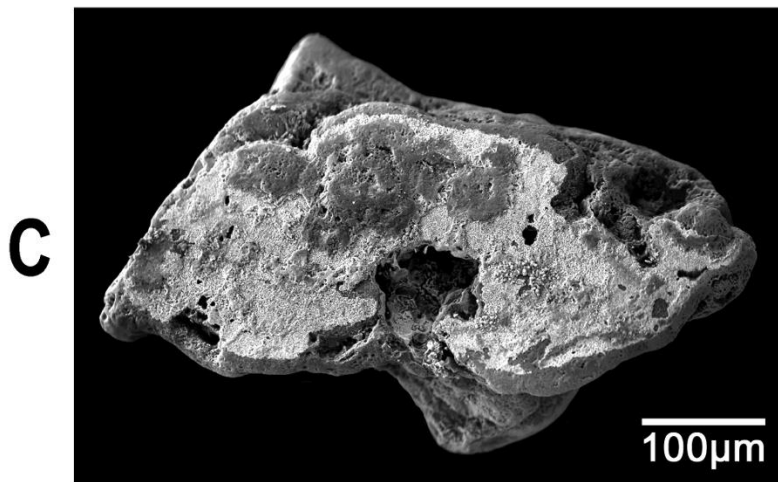
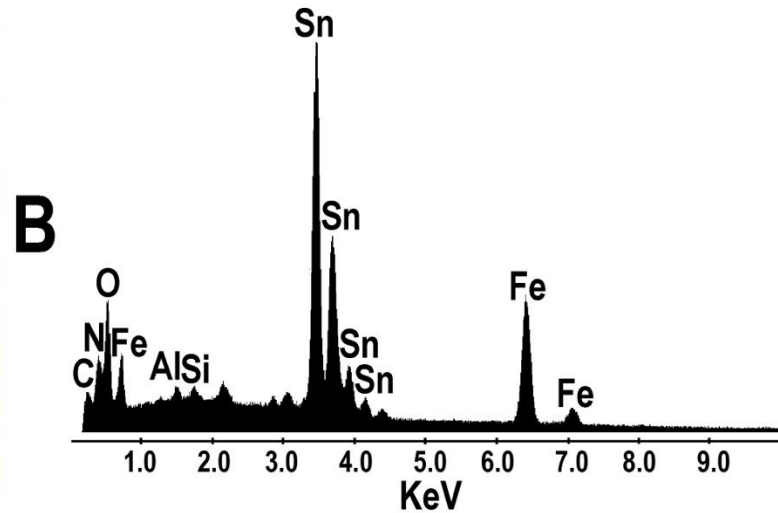
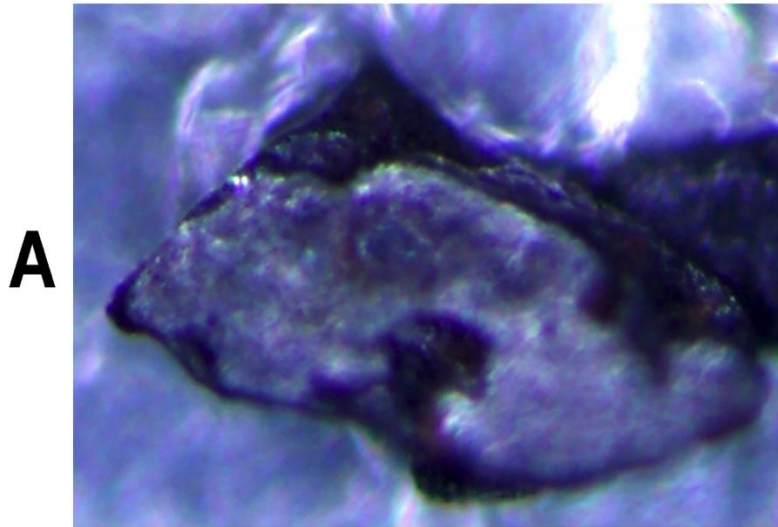


Sn
bearing
particles-
contain
Xe, I, Ni,
Cu, Zn, C

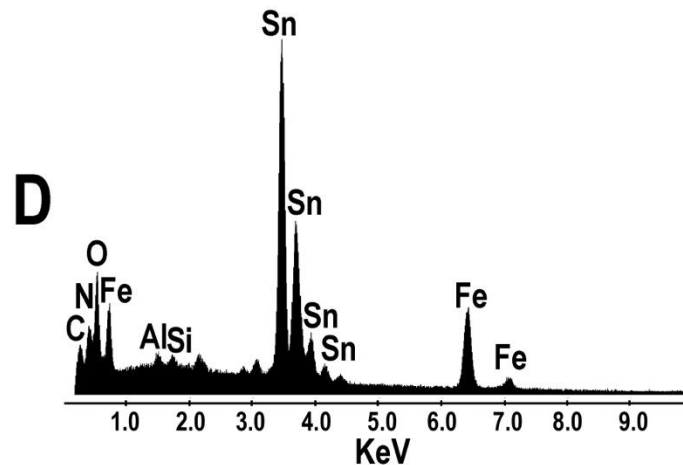
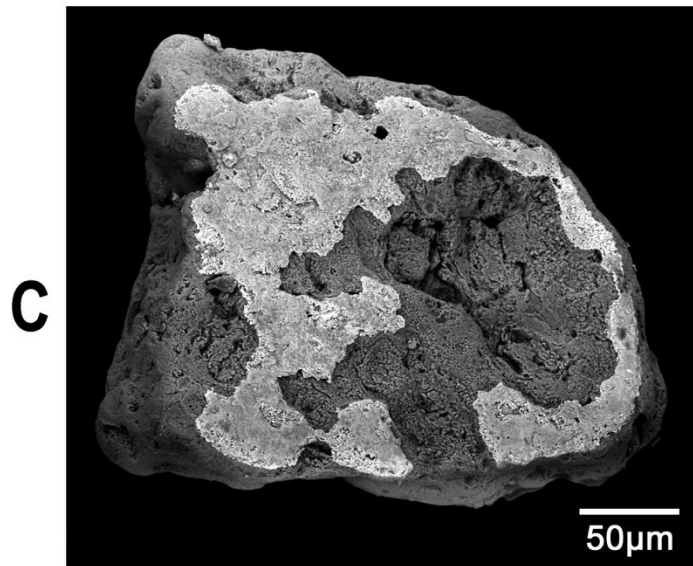
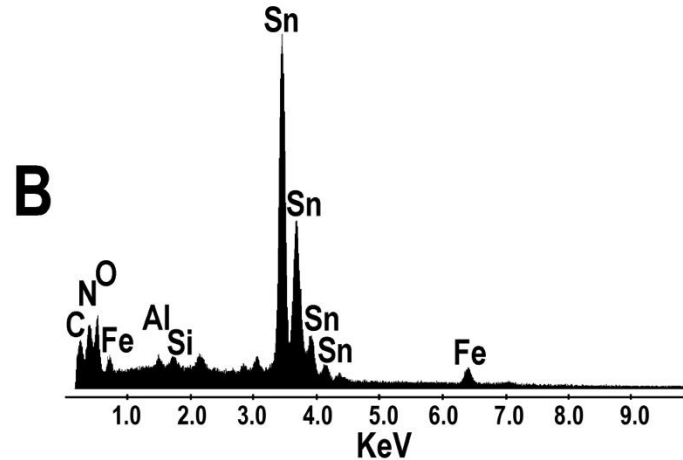
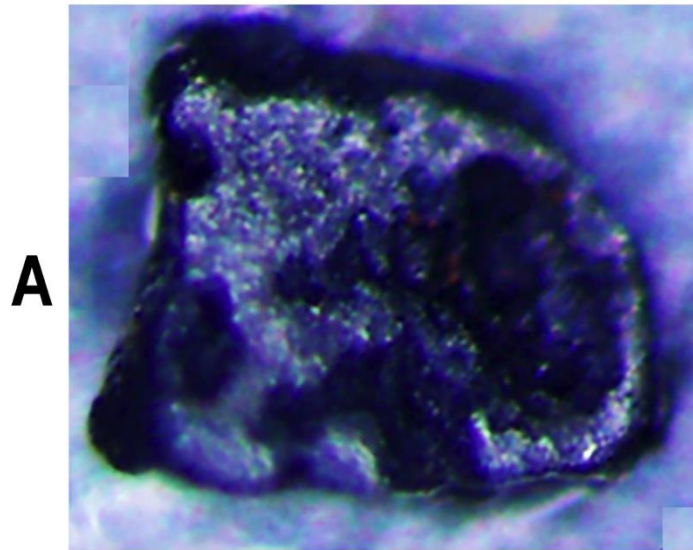
Ni and Sn rich material in GISP2 ice core-all Sn with Ni



Sn coated grain: Svetloyar



Sn coated Grain 2-Svetloyar



Conclusions-Russian impact lakes

- 1) Ni rich material present at Smerdyachee
- 2) Fossils from rock at least 40 m depth
- 3) Found possible distal ejecta layer
- 4) Sn and Fe rich material present at Svetloyar
- 5) All lakes unproven

Yearly ceremony at Lake Svetloyar



Opera of the Legend of Kitzeh is on U-Tube

<https://steampunkopera.wordpress.com/2012/08/05/the-legendary-sunken-city-of-kitezeh/#>