

31st IAS Meeting of Sedimentology

Kraków, 22-25.06.2015

W drugiej połowie czerwca **doktorant Centrum Studiów Polarnych i członek IAS mgr Krzysztof Senderak** brał udział w międzynarodowej konferencji 31st IAS Meeting of Sedimentology w Krakowie. Organizatorami spotkania byli International Association of Sedimentologists oraz Polskie Towarzystwo Geologiczne. W konferencji wzięło udział ponad 700 osób z całego Świata, w tym m.in. Chin, Stanów Zjednoczonych, Wielkiej Brytanii, czy Australii. Udział doktoranta w konferencji został dofinansowany ze środków **Centrum Studiów Polarnych KNOW** (Krajowy Naukowy Ośrodek Wiodący).

W ramach konferencji zaplanowano trzy dni, podczas których uczestnicy mieli możliwość prezentacji swoich osiągnięć naukowych na kilkudziesięciu sesjach tematycznych – dotyczyło to prezentacji ustnych oraz posterów. Doktorant CSP czynnie uczestniczył w sesji posterowej pod nazwą „**Glacial depositional system**” odbywającej się pierwszego dnia. Zaprezentował poster ***Morphodynamics and internal structure of the talus slopes in the polar environment***.

Szczególnym zainteresowaniem doktoranta cieszyły się sesje *“At the cross-roads of sedimentology and geophysics”*, *„Sedimentary response of polar coastal and shallow marine environments to climate changes”*, *“Advances in delta sedimentology and stratigraphy in ancient and modern settings”* oraz *“Alluvial, colluvial and lacustrine depositional systems”*. Każdy dzień konferencyjny rozpoczynał się dwoma wykładami wprowadzającymi. Jednym z nich był wykład prof. Wojciecha Nemeca z University of Bergen na temat *„Colluvium – the ugly duckling of clastic sedimentology”*. Dla doktoranta CSP wykład ten był niemal dedykowany i stał się motywacją do dalszego działania w zakresie stoków usypiskowych.

Oprócz doktorantem z Uniwersytetu Śląskiego, Centrum Studiów Polarnych reprezentowały **mgr Joanna Ćwiąkała z Instytutu Geofizyki PAN** (poster *Submarine features formed in the coastal zone as a result of the Hans Glacier recession and the impact of oceanographic conditions (Isbjørnhamna, Hansbukta, Hornsund)*) oraz **mgr inż. Magdalena Lawręc z Instytutu Oceanologii PAN** (poster *Carotenoids in recent sediments of the Gulf of Gdańsk (Baltic Sea)*).

32nd IAS Meeting of Sedimentology odbędzie się w Marakeszu (Maroko) w dniach 23-25.05.2016 r.

Krzysztof Senderak

OUTLINE OF THE RESEARCH PROBLEM

The talus slopes are one of the most common sedimentary environment in the polar regions. As the slopes have developed in the conditions of the periglacial zone in Svalbard since deglaciation, they may be the record of events and climate conditions from the beginning of the Holocene age in the area.

The comprehensive studies on the subject of talus slopes developing in the polar environment are presented in this poster. The relation between sediment's maturity and activity of slope processes has been described on the basis of fieldwork and scientific observations. The most significant information about morphodynamics of talus slopes was obtained in the course of granulometric measurements of coarse fraction material from the whole surface of slopes (99 sites) as well as fine fraction material from the eastern part of slopes (17 samples). The internal structure was studied with the usage of electrical resistivity tomography (ERT). The whole was completed by morphometric and morphogenetic measurements. The matter of chemical weathering (dissolution of feldspar) in conditions of the periglacial zone was studied with hydrogeological analysis.

The aim of the studies is to describe the mechanisms of contemporary movements of material on talus slopes in the polar environment. Particularly important information included in the type of deposition. The sediment maturity and internal structure, which are prepared in the material, and the way of understanding processes and conditions that are crucial for shaping talus slopes. The preliminary model of the evolution of talus slopes in the polar environment was based on these research.

STUDY AREA

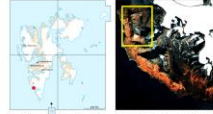


Fig. 1. The map of Svalbard. The study area is marked by red point. The Gullfjellet and Brattøyplassen talus slopes are also marked.



Fig. 2. The aerial view of the Gullfjellet formation with the location of Fig. 3. The red arrows indicate the location of talus cones. The average inclination of the cones is 35-40, the average length of (photogrammetry).



Fig. 3. The red arrows indicate the location of talus cones. The average inclination of the cones is 35-40, the average length of (photogrammetry).

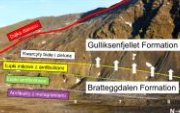


Fig. 4. The geological sketch of the eastern slope of the Gullfjellet formation.



Fig. 5. The aerial view of the study area showing the location of the Gullfjellet and Brattøyplassen formations.



Fig. 6. The aerial view of the study area showing the location of the Gullfjellet and Brattøyplassen formations.



Fig. 7. The aerial view of the study area showing the location of the Gullfjellet and Brattøyplassen formations.

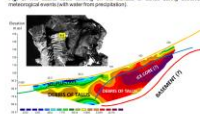


Fig. 8. The 3D visualization of electrical resistivity tomography in cone S-2. The red arrows indicate the location of talus cones.

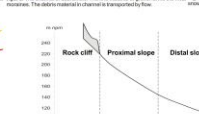


Fig. 9. The cross-section diagram of a talus slope showing different parts: Rock cliff, Proximal slope, Distal slope, and Alluvial slope.



Fig. 10. The cross-section diagram of a talus slope showing different parts: Rock cliff, Proximal slope, Distal slope, and Alluvial slope.

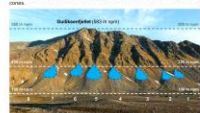


Fig. 11. The aerial view of the study area showing the location of the Gullfjellet and Brattøyplassen formations.



Fig. 12. The aerial view of the study area showing the location of the Gullfjellet and Brattøyplassen formations.



Fig. 13. The aerial view of the study area showing the location of the Gullfjellet and Brattøyplassen formations.

THE CONCLUSIONS

The main mechanisms of contemporary transport of material on talus slopes in the polar environment are particle fall and rock fall. The talus flow tracks are often observed in proximal slope segment. The distal part is shaped by snow and rock avalanches. The fine fraction sediments are transported by diffusion and suspension transport. The evolutionary model of slopes for polar regions should assume intensity of chemical weathering and dissolution of rocks.

THE REFERENCES

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Fot. 1. Poster doktoranta CSP.



Fot. 2-3. Sesja posterowa i wykład wprowadzający prof. Wojciecha Nemeza z University of Bergen.