

Dr. rer. nat. Guido Grosse

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General research interests:

- Climate change in the Arctic and permafrost degradation
- Remote sensing of permafrost degradation
- Spatial data analysis in permafrost regions
- Environmental feedbacks of permafrost degradation
- Permafrost and palaeo-environmental reconstruction
- Permafrost and coastal processes
- Periglacial geomorphology
- Martian permafrost

Education

11/2001 – 03/2005

Alfred Wegener Institute for Polar and Marine Research, Research Unit
Potsdam / University of Potsdam, Germany

- Title of the dissertation in geology: "Characterisation and evolution of Late Quaternary periglacial landscapes in Northern Siberia – Remote sensing and GIS studies", degree: **magna cum laude**
- Focus on optical remote sensing of Arctic periglacial landscapes, terrain modeling, stratigraphy of permafrost deposits, and Late Quaternary landscape evolution in North Siberia

09/1995 – 10/2001

Technical University and Mining Academy Freiberg, Germany

- Diploma in geology, overall grade: **1.3**
- Title of the diploma thesis in geology: "Geochronology of Late Quaternary sediments of the Laptev Sea coast, North Siberian Arctic, with Infrared Optical Stimulated Luminescence", grade: **1.2**
- Title of the diploma mapping thesis: "Geological mapping of Quaternary permafrost deposits on the Big Lyakhov Island, New Siberian Islands", grade: **1.3**
- Focus on sedimentology, stratigraphy, and economic geology

Appointments

08/2006 – present	IPY Presidential Postdoctoral Fellow at the University of Alaska Fairbanks
06/2006 – 08/2008	Postdoctoral Fellow at the Permafrost Laboratory, Geophysical Institute UAF
03/2005 – 03/2006	Research assistant, AWI for Polar and Marine Research, Research Unit Potsdam <ul style="list-style-type: none">▪ Optical remote sensing using ENVI▪ Data integration using ArcGIS▪ Map production using ArcGIS
11/2001 – 03/2005	Research assistant (Ph.D. student), AWI for Polar and Marine Research, Research Unit Potsdam <ul style="list-style-type: none">▪ Remote sensing of Arctic landscapes with multispectral and panchromatic sensors (Landsat-7, CORONA, aerial imagery) using ENVI▪ Creation of high resolution terrain models using ArcInfo▪ Integration and analysis of complex spatial information datasets using ArcGIS▪ Investigation of Late Quaternary palaeo-environmental conditions in the permafrost regions of North Siberia
01/2000 – 10/2001	Student assistant, Technical University and Mining Academy Freiberg <ul style="list-style-type: none">▪ Extensive work in the Luminescence Dating Laboratory of the Saxon Academy of Sciences
10/1999 – 12/1999	Student assistant, Technical University and Mining Academy Freiberg
04/1999 – 05/1999	<ul style="list-style-type: none">▪ Digitising of topographical maps of the Lena Delta with AtlasGIS & ArcView

International experience

2006 – present	Postdoctoral Fellow at the University of Alaska Fairbanks
1999 – 2005	Participation in 5 international Arctic expeditions to North Siberia, Russia, under a wide variety of aspects in permafrost research (remote sensing, geomorphology, permafrost degradation, sedimentology, cryology, stratigraphy, Late Quaternary palaeo-environment)
1999 – 2007	Presentation of research results at international conferences with oral or poster presentations (Russia, Svalbard, U.S.A., France, Germany)
2004	Research period at the University of Edinburgh, United Kingdom
2001	Research period at the Permafrost Institute Yakutsk, Russia
1998	Student internship in the INA Oil Industries Inc., Oil and Gas Production Division, Zagreb, Croatia

Awards and grants

2006 – 2009	IPY Presidential Postdoctoral Fellowship of the University of Alaska (~ \$165 000)
2005	ESA (European Space Agency) grant (~ \$600) <ul style="list-style-type: none">▪ Principal investigator for the acquisition of hyperspectral satellite data from the sensor CHRIS-Proba in the Siberian Lena Delta region during summer 2005▪ Project title: Characterisation of periglacial surfaces, land cover mapping and change detection in the Lena River Delta, Northeast Siberia
01/2004 – 04/2004	DAAD (German Academic Exchange Service) stipendium (~ \$6 400) <ul style="list-style-type: none">▪ Research period at the Department of Physical Geography in the School of Geosciences, with a focus on remote sensing techniques and GIS; University of Edinburgh, United Kingdom
11/2001 – 03/2005	AWI Ph.D. stipendium (~ \$48 000) <ul style="list-style-type: none">▪ Alfred Wegener Institute for Polar and Marine Research, Research Unit Potsdam
08/2001 – 09/2001	Travel grant (~ \$900) of the Förderkreis Freiburger Geowissenschaften e.V. <ul style="list-style-type: none">▪ Research period with a focus on data mining and literature investigation in the extensive archives of the Permafrost Institute of the Russian Academy of Sciences, Yakutsk, Russia
09/1998 – 10/1998	IAESTE intership stipendium (~ \$1 200)(International Association for the Exchange of Students for Technical Experience) <ul style="list-style-type: none">▪ INA Oil Industries Inc. Zagreb / Oil and Gas Production Division; Zagreb, Croatia
1999 – 2005	5 AWI travel grants for oral or poster presentations at international conferences

Memberships

American Geophysical Union

United States Permafrost Association

Permafrost Young Researchers Network

Additional skills

Languages	<ul style="list-style-type: none"> ▪ German: native language ▪ English: fluent ▪ Russian: very good basic knowledge
Software	<ul style="list-style-type: none"> ▪ Proficient: MS Word, Excel and Powerpoint, ArcGIS, ENVI, Corel Draw, Adobe Photoshop, Endnote, Adobe Acrobat ▪ Good knowledge: MS Access, MicroCal Origin, Erdas Imagine, Macromedia Dreamweaver, Flash, GeoSurfer, MatLab ▪ Participation in special training courses: ArcGIS, ENVI, MatLab
Supervising	<ul style="list-style-type: none"> ▪ Supervision of students working with ArcGIS ▪ Supervision of 2 diploma theses in the field of remote sensing and geospatial data analysis: <ul style="list-style-type: none"> - "Morphometric and statistic analysis of the lakes in the Lena Delta, North Siberia" - "Characteristics and spectral properties of periglacial land surfaces in the western Lena Delta"
Project initiation	<ul style="list-style-type: none"> ▪ Co-PI in a project on circumarctic quantification of trace gas fluxes from thermokarst submitted to NSF's IPY solicitation in Mar-2007 together with K.Walter, M.E Edwards, L. Plug, and L. Slater; decision pending ▪ Co-PI in a project on the application of high-resolution satellite data for the characterisation of the circumarctic ACCO-Net sites together with P.P. Overduin, M. Allard, H. Lantuit, and the ACD steering committee; accepted by ESA IPY programme in Apr-2007 ▪ PI in the project "Characterisation of periglacial surfaces, land cover mapping and change detection in the Lena River Delta, Northeast Siberia" using hyperspectral Chris Proba imagery; accepted by ESA in 2005 and ongoing ▪ Co-Investigator in the project "Permafrost Degradation on Mars - PeDoM" together with E. Hauber (DLR Berlin-Adlershof) & Dr. L. Schirrmeister (AWI Potsdam); accepted by AWI-DLR-FUBerlin in Jan-2006 ▪ Co-Investigator in the project "Lena Delta Environmental Information System - LENDIS" together with Prof H. Asche (Uni Potsdam) & Dr. L. Schirrmeister (AWI Potsdam); rejected by DFG in Dec-2006 ▪ Co-Investigator in a project for the acquisition of ALOS satellite remote sensing data from the Lena Delta: "Lena Delta Morphology – LEDAM" together with Mr. H. Lantuit, Dr. L. Schirrmeister & Dr. J. Boike (all AWI Potsdam); accepted by ESA in Oct-2006

Publications

Manuscripts submitted to international peer-reviewed journals

- 2007 Schneider J, **Grosse G**, Wagner D: Balance of methane emissions from tundra environments of the Lena Delta based on Landsat-7 ETM+ data. (submitted to Remote Sensing of Environment)
- 2007 Andreev AA, Grosse G, Schirrmeister L, Kuzmina SA, Kuznetsova TV, Bobrov AA, Tarasov PE, Ilyashuk BP, Novenko EYu, Meyer H, Kunitsky VV (in prep): Weichselian and Holocene terrestrial palaeoenvironmental records from Bol'shoy Lyakhovsky Island, New Siberian Archipelago, Arctic Siberia.
- 2007 Walter KM, Edwards M, Chapin III FS, Zimov SA, Grosse G (in review): Thermokast lakes as a source of atmospheric CH₄ during the last deglaciation. Science.
- 2007 Morgenstern A, Hauber E, Reiss D, van Gasselt S, Grosse G, Schirrmeister L (accepted). Deposition and degradation of a volatile-rich layer in Utopia Planitia, and implications for climate history on Mars. Journal of Geophysical Research
- 2007 Ulrich M, Grosse G, Schirrmeister L. (in prep): Arctic periglacial surface features as environmental indicators using field spectrometry and remote sensing data.
- 2006 Kienast F, Tarasov P, Schirrmeister L, Grosse G, Hubberten H-W (in review): Continental climate in the East Siberian Arctic during the last interglacial: implications from palaeobotanical records. Global and Planetary Change

Manuscripts published in international peer-reviewed journals

- 2007 **Grosse G, Schirrmeister L, Siegert Ch, Kunitsky VV, Slagoda EA, Andreev AA, Dereviagn AYU (2006): Geological and geomorphological evolution of a sedimentary periglacial landscape in Northeast Siberia during the Late Quaternary. Geomorphology 86(1-2): 25-51. doi:10.1016/j.geomorph.2006.08.005**
- 2006 **Grosse G**, Schirrmeister L, Malthus T: Identification and quantification of Holocene thermokarst features in the periglacial Lena-Anabar coastal lowland: A remote sensing and GIS approach. Polar Research 25(1): 51-67.
- 2005 **Grosse G**, Schirrmeister L, Kunitsky VV, Hubberten H-W: The use of CORONA images in remote sensing of periglacial geomorphology: An illustration from the NE-Siberian coast. Permafrost and Periglacial Processes 16: 163-172.
- 2004 Andreev AA, **Grosse G**, Schirrmeister L, Kuzmina SA, Novenko EYu, Bobrov AA, Tarasov PE, Kuznetsova TV, Krbetschek M, Meyer H, Kunitsky VV: Late Saalian and Eemian palaeoenvironmental history of the Bol'shoy Lyakhovsky Island (Laptev Sea region, Arctic Siberia). Boreas 33: 319-348.
- 2003 Schirrmeister L, Kunitsky VV, **Grosse G**, Schwamborn G, Andreev AA, Meyer H, Kuznetsova T, Bobrov A, Oezen D: Late Quaternary history of the accumulation plain north of the Chekanovsky Ridge (Lena Delta, Russia) - A multidisciplinary approach. Polar Geography 27: 277-319.

- 2002 Kunitsky VV, Schirrmeister L, **Grosse G**, Kienast F: Snow patches in nival landscapes and their role for the Ice Complex formation in the Laptev Sea Coastal lowlands. Polarforschung 70: 53-67.

Oral presentations at international conferences

- 2006 **invited** Grosse G, Schirrmeister L, Siegert Ch, Meyer H, Andreev AA, Kunitsky VV, Derevyagin AYu, Hubberten H-W: Climate-induced dynamics of periglacial landscapes in NE Siberia – The western edge of Beringia during the Late Quaternary. AGU Fall Meeting, 11-15 December, San Francisco, U.S.A.
- 2006 Grosse G, Brown J, Romanovsky VE: The response and role of permafrost on a warming planet. ICARP II Implementation Workshop, 19-21 November, Potsdam, Germany.
- 2006 Grosse G, Schirrmeister L, Siegert Ch, Kunitsky VV, Slagoda EA, Andreev AA, Dereviagyn AYu: Geological and geomorphological evolution of a sedimentary periglacial landscape in Northeast Siberia during the Late Quaternary. AAAS Arctic Science Conference, 2-4 October, Fairbanks, Alaska, U.S.A.
- 2006 Morgenstern A., Hauber E, Reiss D, van Gasselt S, Grosse G, Schirrmeister L : Deposition and degradation of a volatile-rich layer in Utopia Planitia, Mars. European Planetary Science Congress (Europlanet #1), 18 – 22 September, Berlin, Germany.
- 2006 Morgenstern A, Hauber E, Reiss D, van Gasselt S, Grosse G, Schirrmeister L: Deposition and Degradation of a Volatile-rich Layer in Utopia Planitia, Mars. 4th International Conference on Mars Polar Science and exploration, October 2–6, Davos, Switzerland.
- 2006 **invited** Grosse G, Romanovsky VE: Characteristics and dynamics of climate-induced permafrost degradation in northern hemisphere permafrost regions - Presentation of an IPY Postdoctoral Fellowship at the UAF. Helge Ingstad Memorial Symposium on Arctic Change, 8-9 September, Fairbanks, U.S.A.
- 2006 Morgenstern A, **Grosse G**, Schirrmeister L., Asche H.: Morphometry and spatial distribution of lakes in the Lena Delta, NE Siberia (Remote Sensing and GIS analyses). European Geosciences Union 2006, Geophysical Research Abstracts, Vol. 8, 00482.
- 2005 **Grosse G**, Schirrmeister L, Kunitsky VV, Rachold V, Grigoriev MN, Hubberten H-W: Volumetric balance of Ice Complex deposits at Bykovsky Peninsula in NE Siberia, using field data, remote sensing and digital elevation models. 2nd European Conference on Permafrost EUCOP II 2005, Potsdam, Germany.
- 2005 **Grosse G**, Schirrmeister L, Hubberten H-W, Kunitsky VV: Remote sensing and classification of thermokarst structures formed during Holocene climate changes in the Laptev Sea coastal region, Arctic Siberia. Shifting Lands Conference on Periglacial Geomorphology, 2nd Meeting ESF Sediflux Network, 20-22 Jan., Clermont-Ferrand, France, January 2005.
- 2002 **Grosse G**, Schirrmeister L: Periglacial structures – a comparison of satellite and field observations. 7th Symposium on Remote Sensing in the Polar Environment, Longyearbyen, Svalbard, 24-27 June 2002.

- 2002 **Grosse G**, Hauber E, van Gasselt S, Reiss D, Lanz J, Schirrmeister L: Periglacial features on Earth (Siberian Arctic) and possible Martian analogues - Quantitative morphology of patterned ground and thermokarst structures. Workshop on Water in the Upper Martian Surface, 17-19 April, Potsdam, Germany.

Poster presentations at international conferences

- 2006 Schneider J, Grosse G, Kutzbach L, Wagner D: Land cover classification of tundra environments in the Arctic Lena Delta based on Landsat 7 ETM+ data and its application for upscaling of methane emissions. First Global Wetland Symposium, 19-20 October, ESA-ESRIN, Frascati, Rome, Italy.
- 2006 Grosse G, Ulrich M, Schirrmeister L: Characterization of periglacial surfaces in the Arctic Lena Delta using satellite data and field spectrometry. 4th ESA CHRIS/Proba Workshop, 19-21 September, Frascati, Rome, Italy.
- 2006 Ulrich M, **Grosse G**, Schirrmeister L, Heinrich J: Characteristics and spectral properties of periglacial landforms in the Lena Delta, Arctic Russia. European Geosciences Union 2006, Geophysical Research Abstracts, Vol. 8, 00454.
- 2006 **Grosse G**, Schirrmeister L, Morgenstern A: Periglacial landscape dynamics and permafrost degradation in the Lena-Anabar coastal lowland - Application of Landsat-7 ETM+ data, a digital elevation model and GIS analyses. 8th workshop on Russian-German Cooperation: SYSTEM LAPTEV SEA Process studies on permafrost dynamics in the Laptev Sea. St. Petersburg, Russia, February 2006.
- 2004 **Grosse G**, Schirrmeister L: Application of Landsat-7 remote sensing data and GIS for the quantification of Holocene thermokarst effects in the Lena-Anabar coastal area of the Laptev Sea, NE Siberia. 1st Göttingen GIS and Remote Sensing Days, Göttingen, Germany, October 2004.
- 2004 **Grosse G**, Schirrmeister L: The use of Landsat-ETM Data, Digital Elevation Models and GIS Analyses for Quantification of Holocene Thermokarst: An Example From the Lena-Anabar Coastal Region (NE Siberia). American Geophysical Union Fall Meeting, San Francisco, U.S.A., December 2004.
- 2002 **Grosse G**, Schirrmeister L, Hubberten H-W, Kunitsky VV: Rekonstruktion spätquartärer Landschaftsentwicklung in Nordost-Sibirien – Vergleich periglazialer Strukturen mittels Feld- und Satellitendaten. Geo2002 Conference, Würzburg, Germany.
- 2002 **Grosse G**, Schirrmeister L: Dating of Late Quaternary Permafrost Deposits in Siberia – Aims, Challenges and Possible Solutions. 8th Colloquium on Luminescence and ESR Dating, Dietrichsmühle, Germany, 18. - 20. Oktober 2002.
- 2002 **Grosse G**, Schirrmeister L, Krbetschek MR, Schwamborn G, Oezen D, Kunitzky VV, Kuznetsova T, Kuzmina S: New data on late Quaternary terrestrial permafrost deposits of the Laptev Sea region by IR-OSL, Radiocarbon and U/Th age determination. Conference Climate Drivers of the North, St. Petersburg, Russia, Terra Nostra 2002/3: 46-47.
- 2001 **Grosse G**, Schirrmeister L, Krbetschek MR, Kunitzky VV, Kuznetsova T, Tumskey V, Meyer H: The new chronology of Quaternary permafrost sediments from Bol'shoy Lyakhovsky Island, New-Siberian Archipelago, by several different age determination methods. 20th Workshop of the German Society for Polar Research in Dresden, Germany.

2000 **Grosse G**, Schirrmeister L, Kunitzky VV, Kuznetsova T, Tumskey V: Quaternary sediments of the south coast of Bol'shoy Lyakhovsky Island. 6th Workshop on Russian-German Cooperation: Laptev Sea System, St. Petersburg, Russia, Terra Nostra 2000/8: 35.

1999-
2006 15 more poster with contribution as co-author

Monographs and reports

2005 **Grosse G**: Characterisation and evolution of Late Quaternary periglacial landscapes in Northern Siberia – Remote sensing and GIS studies. Doctoral thesis, University of Potsdam, 125 p.

2004 **Grosse G**: Multi-sensor optical remote sensing of periglacial tundra landscapes. Reports on Polar and Marine Research 489: 75-91.

2003 **Grosse G**, Schirrmeister L, Kunitzky VV, Derivyagin A: Periglacial features around Tiksi. Reports on Polar and Marine Research 466: 137-191.

2001 **Grosse G**: Geochronology of Late Quaternary sediments of the Laptevsea coast, North Siberian Arctic, with Infrared Optical Stimulated Luminescence. Diploma thesis, Technical University and Mining Academy Freiberg: 119 p.

2000 **Grosse G**: Geological mapping of Quaternary permafrost deposits on the Big Lyakhov Island, New Siberian Islands. Diploma mapping thesis, Technical University and Mining Academy Freiberg: 88 p.

2000-
2006 4 more reports with contributions as co-author