CURRICULUM VITAE SERGEI MARCHENKO

EDUCATION:

2000 Ph.D. in Physical Geography. Specialty: Geocryology and Glaciology. Moscow State University.
1991 M.S. in Physical Geography. Emphasis in Mathematical Methods in Geology. Moscow State University, Geological Department.
1985 B.S. in Mechanical Engineering. Emphasis in theoretical mechanics. Department of Mechanics, Agricultural Institute.

PROFESSIONAL EXPERIENCE:

2008 - present Research Associate Professor, Geophysical Institute, University of Alaska Fairbanks.
2006 –2008 Research Associate, Geophysical Institute, University of Alaska Fairbanks.
2003 –2006 Visiting Research Scholar, Geophysical Institute, University of Alaska Fairbanks.
1993 – 2003 Senior Scientist, Yakutsk Permafrost Institute, Siberian Branch of Russian Academy of Sciences, Kazakhstani Alpine Permafrost Laboratory.
1989 – 1993 Engineer, Yakutsk Permafrost Institute, Siberian Branch of Russian Academy of Sciences.
1985 – 1989 Engineer, Research Institute of Mechanics, Almaty, Kazakhstan.

RESEARCH INTERESTS:

Interaction between climate and permafrost in Arctic and Sub-Arctic; Altitudinal permafrost formation, distribution and evolution in the mid latitudinal mountain regions; Modeling of the temporal and spatial permafrost dynamics.
Web: http://www.gi.alaska.edu/snowice/Permafrost-lab/people/Marchenko.html

LIST OF PUBLICATIONS:

Books:

1. **Marchenko**, S. (2003). *Permafrost of the Northern Tien Shan: past, present and future*. Siberian Branch of Russian Academy of Sciences: Yakutsk. 106 p. (In Russian)
2. Romanovsky, V.E., Gruber, S., Instanes, A., Jin, H., **Marchenko**, S.S., Smith, S.L., Trombotto, D., & Walter, K.M., (2007). Frozen Ground, Chapter 7, In: *Global Outlook for Ice and Snow*, Earthprint, UNEP/GRID, Arendal, Norway, pp. 181-200. UNEP, 2007. Global Outlook for Ice and Snow. In: J. Eamer (ed). Norway: UNEP/GRID-Arendal, 235 pp. Also available at: http://www.unep.org/geo/geo_ice/PDF/full_report_LowRes.pdf http://www.unep.org/publications/search/pub_details_s.asp?ID=3945
3. Bourgeois, J., Gheyle, W., Goossens, **Marchenko**, S. and A. De Wulf. (2006). Disappearing permafrost and UNESCO, Chapter 3, In: *The Frozen Tombs of the Altai Mountains*. (Bourgeois, J. and W. Gheyle ed.). Ghent, UNESCO WHC & UGent. 69-83.
4. **Marchenko**, S. (2008). Climate Change and its Impact on the Frozen Tombs of the Altai Mountains, pp. 61-63. UNESCO Project Preservation of Frozen Tombs of the Altai Mountains, Chapter 2, In: *Preservation of the Frozen Tombs of the Altai Mountains*. UNESCO. 80 pp.

Peer Reviewed Papers:

5. **Marchenko**, S., Romanovsky, V. & Tipenko, G. (2008). Numerical Modeling of Spatial Permafrost Dynamics in Alaska. *Proceedings of the Ninth International Conference on Permafrost*, University of Alaska Fairbanks, Jun 29 - July 3, 2008, 2: 1125-1130.
6. Romanovsky, V.E., Kholodov, A.L., **Marchenko**, S.S., Oberman, N.G., Drozdov, D.S., Malkova, G.V., Moskalenko, N.G., Vasiliev, A.A., Sergeev, D.O., and Zheleznyak, M.N. (2008). Thermal State and Fate of Permafrost in Russia: First Results of IPY (Plenary Paper). *Proceedings of the Ninth International Conference on Permafrost*, University of Alaska Fairbanks, June 29 - July 3, 2008, 2: 1511-1518.
7. Romanovsky, V.E., **Marchenko**, S.S., Daanen, R., Sergeev, D.O., and Walker, D.A. (2008). Soil Climate and Frost Heave Along the Permafrost/Ecological North American Arctic Transect.

Proceedings of the Ninth International Conference on Permafrost, University of Alaska Fairbanks, June 29 - July 3, 2008, 2: 1519-1524.

8. Stendel, M., Christensen, J.H., Aðalgeirsdóttir, G., Daanen, R., **Marchenko**, S., and Romanovsky, V. (2008). The Fate of Greenland's Permafrost: Results from High-Resolution Transient Climate Simulations. *Proceedings of the Ninth International Conference on Permafrost*, University of Alaska Fairbanks, June 29 - July 3, 2008, 2: 1705-1709.
9. Zhao, L., **Marchenko**, S.S., Sharkhuu, N., and Wu, T. (2008). Regional Changes of Permafrost in Central Asia (Plenary Paper). *Proceedings of the Ninth International Conference on Permafrost*, University of Alaska Fairbanks, June 29 - July 3, 2008, 2: 2061-2069.
10. Riseborough, D., Shiklomanov, N.I., Etzelmuller, B., Gruber, S., & **Marchenko**, S. (2008). Space, time, and permafrost: Recent advances in permafrost modeling. *Permafrost and Periglacial Processes*. (19): 2, 137-156.
11. Jorgenson, T., Yoshikawa, K., Kanevskiy, M., Shur, Y., Romanovsky, V., **Marchenko,** S., Grosse, G., Brown, J., and Jones, B. (2008). Permafrost Characteristics of Alaska. *Ninth International Conference on Permafrost*, University of Alaska Fairbanks, June 29 - July 3, 2008. Extended Abstracts, 121-122.
12. Liljedahl, A., Hinzman, L., **Marchenko,** S., and Berezovskaya, S. (2008). The Effect of Spatially Distributed Snow Cover on Soil Temperatures: A Field and Modeling Study. *Ninth International Conference on Permafrost*, University of Alaska Fairbanks, June 29 - July 3, 2008. Extended Abstracts, 183-184.
13. **Marchenko,** S., Sharkhuu, N., Li, X., Ishikawa, M., Brown, J., Romanovsky, V., and Drodzov, D. (2008). Toward a Permafrost Map of Central Asia. *Ninth International Conference on Permafrost*, University of Alaska Fairbanks, June 29 - July 3, 2008. Extended Abstracts, 203-204.
14. Daanen, R.P., Romanovsky, V.E., **Marchenko,** S.S., Christensen, J.H., Stendel, M. and Ingeman-Nielsen, T. (2008). Greenland Permafrost Temperature Simulations. *Ninth International Conference on Permafrost*, University of Alaska Fairbanks, June 29 - July 3, 2008. Extended Abstracts, 55-56.
15. **Marchenko**, S., Gorbunov, A. and V. Romanovsky. (2007). Permafrost Warming in the Tien Shan Mountains, Central Asia. *Global and Planetary Change*, 56, 311 – 327.
16. Shiklomanov, N. I., O. A. Anisimov, T. Zhang, S. **Marchenko**, F. E. Nelson, and C. Oelke (2007), Comparison of model-produced active layer fields: Results for northern Alaska, *J. Geophys. Res.*, 112, F02S10, doi:10.1029/2006JF000571.
17. Sergei **Marchenko**, Mamoru Ishikawa, N. Sharkhuu, Huijun Jin, Xin Li, Zhao Lin, Hironori Yabuki, Jerry Brown. 2007. Distribution and Monitoring of Permafrost in Central and Eastern Asia. *Proceedings of the International Symposium Asian Collaboration in IPY 2007-2008*. March 1, 2007, Tokyo, Japan.
18. Bolch, T. & **Marchenko**, S. (2006). Significance of glaciers, rockglaciers, and ice-rich permafrost in the Northern Tien Shan as water towers under climate change conditions. *Proceedings of the UNESCO Workshop "Assessment of Snow-Glacier and Water Resources in Asia"*, 28-30 Nov. 2006, Almaty, Kazakhstan, 199-211. Also available at http://web.unbc.ca/~bolch/publications/BolcMarc06_UNESCOAlma.pdf
19. **Marchenko**, S., Gorbunov, A. and V. Romanovsky. (2006). Changes in Climate and Permafrost and Impact on Frozen Tombs in the Mountains of Central Asia. *UNESCO Workshop "The Frozen Tombs of the Altai Mountains: Strategies and Perspectives"*. Gorno-Altaisk, Russia, 28-31 March 2006. 283-299.
20. Romanovsky, V. E., **Marchenko**, S. S. and G. S. Tipenko. (2005). Permafrost in Alaska: Multi-Millennium History and Possible Future Changes, *2nd European Conference on Permafrost*, June 12-16, Potsdam, Germany.
21. **Marchenko**, S., Medeu, A. and Gorbunov, A. (2005). Permafrost Warming and Ground Ice as a Potential Freshwater Source in the Arid Regions of Central Asia. GCOS. *GCOS Action Plan for Central Asia*. Geneva, November 2005, 53-59. Also available at http://www.wmo.ch/pages/prog/gcos/documents/GCOS_CA_RAPeng.pdf

22. Gorbunov, A., **Marchenko**, S. and Seversky, E. (2004). The Thermal Environment of Blocky Materials in the Mountains of Central Asia. *Permafrost and Periglacial Processes* 15: 95–98.
23. **Marchenko**, S. S. and Udartsev, S. V. (2004). The Geoinformatic Model of High-mountain Permafrost in the Northern Tien Shan. *ArcReview. Modern Geoinformatic Technologies*. Moscow, Data Plus, No 1, p. 15-16.
24. **Marchenko**, S. (2003). Borehole and active-layer monitoring in the northern Tien Shan (Kazakhstan). *Proceedings of the Eighth International Conference on Permafrost, Permafrost.* Extended abstracts. (Haeberli, W. and Brandova, D. eds), Zurich, Switzerland, July 21-25, 2003, 101-102.
25. Gravis, G. F., Melnikov, E. S., Guo, D., Li, Sh., Li Shude, Tong, B., Zhao, L., Nan, Z., Sharkhuu, N., Gorbunov, A. P., **Marchenko**, S. S. and Seversky, E. V. (2003). Principles of classification and mapping of permafrost in Central Asia. *Proceedings of the 8th International Conference on Permafrost*, Zurich, Switzerland, July 21-25, 2003, 1: 297-302.
26. **Marchenko**, S. (2002). Results of monitoring of active layer in the Northern Tien Shan Mountains. *J. Earth Cryosphere.* 4(3): 25-34. (In Russian with English abstract).
27. Gorbunov, A. P., **Marchenko**, S. S. and Seversky, E. V. (2002). Cryoecology of Tien Shan. *Proceedings of annual Cession of scientific council of Russian Academy of Sciences*. V. 4. Moscow, GEOS, p. 433-438. (In Russian).
28. Gorbunov, A. P., **Marchenko**, S. S. and Seversky, E. V. (2002). Permafrost-related Engineering Problems in the Central Asian Mountains. *Permafrost Engineering. Fifth International Symposium Proceedings.* Yakutsk, Russia, 2-4 September 2002. 1: 214-218.
29. **Marchenko**, S. (2001). A model of permafrost formation and occurrences in the intracontinental mountains. *Norsk Geografisk Tidsskrift – Norwegian Journal of Geography.* 55: 230-234. Oslo. ISSN 0029-1951.
30. **Marchenko**, S., Sharkhuu, N. and Udartsev, S. V. (2001). Distribution modeling of alpine permafrost in the arid mountains (a GIS approach). *Proceedings of International Symposium on Mountain and Arid Land Permafrost*, Ulaanbaatar, Mongolia, September 2-7, 2001, p. 43-47.
31. **Marchenko**, S. and Udartsev, S. V. (2001). Geo-informational modeling of the mountain permafrost thermal state. *Proceedings of the 2nd Conference of the geocryologists of Russia.* Moscow, Moscow State University, June 6-8, 2001, 3: 178-184
32. **Marchenko**, S. S. and Udartsev, S. V. (2001). Geocryological Information System of the Central Northern Tien Shan. *Proceedings of International Conference "Geoecology and Geoecological Problems of Mountains and Intramountans Systems*", Tashkent, Uzbekistan, March 26-28, 2001, p. 79-82.
33. **Marchenko**, S. (1999). Permafrost-Climatic Conditions in the Northern Tien Shan: Recent and Expected for 21st Century Changes. *J. Earth Cryosphere*, Novosibirsk, 3(2): 13-21. (In Russian with English abstract).
34. **Marchenko**, S. S. and Gorbunov, A. P. (1997). Permafrost Changes in the Northern Tien Shan During the Holocene. *J. Permafrost and Periglacial Processes*, Vol. 8, p. 427- 435.
35. **Marchenko**, S. S. (1996). The heat state of permafrost in the Tien Shan Mountains during the Holocene and contemporary tendencies of its change. *Proceedings of International Conf. "Mountain Research - Challenges and Directions for the 21st Century"*, Bishkek, Kyrgyzstan,October 14-18, 1996, p. 115-116.

Abstracts:

36. Sergei **Marchenko**, Jerry Brown, Huijun Jin, Vladimir Romanovsky. (2007). Spatial and Temporal Changes of Permafrost Distribution in Asia. *XVII INQUA Congress. The tropic Heat Engine of the Quaternary. Quaternary International*. Vol. 167-168. Suppl., 2007, 267
37. Nicolsky, D. J., Romanovsky, V. E., Rawlins, M. A. and **Marchenko**, S. S. (2007), Study of permafrost dynamics within the Northern Eurasia Region by a coupling between permafrost and water balance models, *Eos Trans. AGU*, 88(52), Fall Meet. Suppl., Abstract GC23A-0987

38. **Marchenko**, S. and Romanovsky, V. (2007), Modeling the Effect of Organic Layer and Water Content on Permafrost Dynamics in the Northern Hemisphere, *Eos Trans. AGU*, 88(52), Fall Meet. Suppl., Abstract GC23A-0985
39. Yi, S., McGuire, A. D., Harden, J. A., Kasischke, E., Manies, K., Hinzman, L., Liljedahl, A., Romanovsky, V., **Marchenko**, S. (2007), Dynamic Soil Layer Model for Assessing the Effects of Wildfire on High Latitude Terrestrial Ecosystem Dynamics, *Eos Trans. AGU*, 88(52), Fall Meet. Suppl., Abstract B11D-0763.
40. Romanovsky, V., Smith, S., Brown, J., Humlum, O. and **Marchenko**, S. (2006). The Thermal State of Permafrost: A Contribution to the International Polar Year. *Geophysical Research Abstracts*, Vol. 8, 05319, 2006. SRef-ID: 1607-7962/gra/EGU06-A-05319.
41. Romanovsky, V.E., S.S. **Marchenko**, G. Grosse, C R Duguay, M N Zheleznyak, D O Sergeev, (2006), Monitoring and Modeling of the Northern Eurasia Permafrost Dynamics, *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., GC21B-04 INVITED.
42. V E Romanovsky, S S **Marchenko**, R Daanen, D Nikolsky, D O Sergeev, D A Walker, (2006). Soil climate and frost heave along the Permafrost/Ecological North American Arctic Transect, *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstract C44A-06.
43. Romanovsky, V., S. Smith, J. Brown, O. Humlum, S. **Marchenko**. (2006). The Thermal State of Permafrost: A Contribution to the International Polar Year. *87*(52), *EGU Fall Meet. Suppl.*, C44A-06**.** Geophysical Research Abstracts, Vol. 8, 05319
44. **Marchenko,** S, and V, Romanovsky, (2006). Temporal and Spatial Changes of Permafrost in the Tien Shan Mountains Since the Little Ice Age, *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., C51B-0426.
45. **Marchenko**, S and V, Romanovsky (2006). Climate Change and Spatially-temporal Dynamics of Altitudinal Permafrost in Central Asia During the Last Millennia (Modelling Approach). Abstracts. *International Conference on Scythian Archeology and the Archeology of the Altai Mountains*. UNESCO. December 4-6, Gent, Belgium. p.8.
46. **Marchenko**, S and V, Romanovsky. (2006). Thermal Analysis and Methods for Frozen Ground Preservation. Abstracts. *International Conference on Scythian Archeology and the Archeology of the Altai Mountains*. UNESCO. December 4-6, Gent, Belgium. 8-9.
47. **Marchenko**, S., and V. Romanovsky. (2006). Temporal and Spatial Changes of Permafrost Distribution in the Tien Shan Mountains During the Last Millennia. *Asian Conference on Permafrost*. Lanzhou, China, August 7-9, 2006, 140.
48. Romanovsky, V., **Marchenko**, S., Duguay, C., Zheleznyak, M. & Sergeev, D. (2006). Monitoring and modeling of the Northern Eurasia permafrost dynamics. Arctic Science Conference Abstracts 58.
49. **Marchenko**, S., Gorbunov, A., Gravis, G. and Sharkhuu, N. (2005). Permafrost Mapping in Central Asia. *First CliC International Science Conference*. Cryosphere the "frozen" frontier of climate science: Theory, Observations, and Practical Applications Beijing, China, April 11-15, 2005. 190.
50. **Marchenko**, S., Gorbunov, A. and Romanovsky, V. (2005). Permafrost Warming and Ground Ice in the Tien Shan, Central Asia. *First CliC International Science Conference*. Cryosphere the "frozen" frontier of climate science: Theory, Observations, and Practical Applications Beijing, China, April 11-15, 2005, 180.
51. **Marchenko**, S., Tipenko, G., Romanovsky, V., Groshev, V. and T. Sazonova. (2005). Spatially Distributed Model of Permafrost Dynamics in Alaska. *International Conference "Priorities in the Earth Cryosphere Research"*. Pushchino, Russia, 217-218.
52. Tipenko, G., **Marchenko**, S., Romanovsky, V., Groshev, V., and T. Sazonova, (2004). Spatially Distributed Model of Permafrost Dynamics in Alaska, *Eos Trans. AGU*, 85(47), Fall Meet. Suppl., Abstract C12A-02.
53. **Marchenko**, S., Gorbunov, A., and V. Romanovsky, (2004), Permafrost Degradation in the Tien Shan Mountains, Central Asia, *Eos Trans. AGU*, 85(47), Fall Meet. Suppl., Abstract A13B-0109.

Reports:

54. **Marchenko**, S., Drozdov, D. and Ødegård, R. (2006). Standing Committee and Working Group Reports. Mapping and Modeling of Mountain Permafrost. *Frozen Ground*. November, 30: 13-14.

55. **Marchenko**, S., Romanovsky V. and Gorbunov, A. (2005). The permafrost monitoring network in Central Asia as a part of the Global Climate Observing System. *Report of the GCOS Regional Workshop for Central Asia on Improving Observing System for Climate*. Almaty, Kazakhstan, May 24-26, 2004, p.83-88. GCOS-94 (WMO/TD-No.1248). February 2005. Also available at http://www.wmo.int/pages/prog/gcos/Publications/gcos-94eng.pdf
56. **Marchenko**, S., Drozdov, D. and Ødegård, R. (2005). Working Group and Standing Committee Reports. Mapping and Modeling of Mountain Permafrost. *Frozen Ground*. 29: 14.
57. Aldar Gorbunov and **Sergei Marchenko**. News from IPA Members. Kazakhstan. *Frozen Ground.* No29, 2005, p. 26-27.
58. **Marchenko**, S., Drozdov, D. and Ødegård, R. (2004). Mapping and Modeling of Mountain Permafrost. *Frozen Ground.* 28: 17-18.
59. Aldar Gorbunov and **Sergei Marchenko**. News from IPA Members. Kazakhstan. *Frozen Ground.* No27, 2003, p. 28-29.
60. Aldar Gorbunov and **Sergei Marchenko**. News from IPA Members. Kazakhstan. *Frozen Ground.* No26, 2002, p. 28-29.
61. A.P. Gorbunov and S.S. **Marchenko.** News from IPA Members. Kazakhstan. *Frozen Ground.* No22, 1998, p. 27.

SYNERGISTIC ACTIVITIES:

- Co-chair for the Working Group on Mapping and Modeling of Mountain Permafrost, International Permafrost Association (IPA, 2003 - present);
- Expert on mountain permafrost in Central Asia for the Global Climate Observing System (GCOS/WMO);
- High mountain periglacial environment consultant, Institute of Geography, Ministry of Education and Science of the Kazakhstan Republic;
- Collaborator of Circumpolar Active Layer Monitoring a CALM-project;
- Collaborator of Global Terrestrial Network for Permafrost GTNet-P project (GCOS/WMO).

PROFESSIONAL MEMBERSHIP:

American Geophysical Union (AGU)
United States Permafrost Association (USPA)
European Geophysical Union (EGU)

THE FIELDWORK AND EXPEDITIONS:

- 1989-1993 Inner Tien Shan (Kirgizstan)
- 1989-2004 Northern Tien Shan (Kazakstan)
- 1997-1999 Altai, Saur, Djungar Alatau and Northern Tien Shan - as an expert on permafrost, join French, Italian, Belgium, Russian and Kazak archeologic expeditions
- 2001 Mongolian Altai
- 2002 North-east part of Qinghai-Tibet Plateau
- 2002 Join Germany-Russian-Kazakh expedition in the Northern Tien Shan
- 2003 North slope Alaska, Seward Peninsula.
- 2004 North slope Alaska, Seward Peninsula. Northern Tien Shan, Central Asia.
- 2005 North slope Alaska, Seward Peninsula. Northern Tien Shan, Central Asia.
- 2006 Altai Mountains, join Belgium, Russian, USA expedition. Northern Tien Shan Central Asia, Expedition of Geography Institute of Kazakhstan.
- 2006 Qinghai-Tibet Plateau. Survey of the GTNet-P and CALM monitoring sites and permafrost, ground ice, and active layer conditions within Plateau, China.
- 2007 The Alaskan North Slope; Altai Mountains, South Siberia; Tien Shan Mountains, Central Asia, Kazakhstan.

PARTICIPATION IN THE PROJECTS:

Current

- International Arctic Research Center Cooperative Agreement Renewal Proposal, NSF, 2004-2007.
- Permafrost Models Comparison, NSF OPP-0352957 and OPP-0352958, 2004-2007.
- Northern Eurasia Region and Related Impacts on Surface and Sub-Surface Hydrology, NASA, 2006-2009 (Co-PI).
- Permafrost Observatories (INPO), NSF, 2006-2009.
- Development of a Network of Permafrost Observatories in North America and Russia: The US Contribution to the International Polar Year, (collaborator).

Past

- NATO Science Programme 1999, Long-term environmental changes in Central Asia (Tien Shan).
- Climate, permafrost and ground ice change in the Tien Shan 2000-2002, National Geographic Society grant #6686-00.
- 2000-2002 INTAS project “Almaty City/Tuyuksu Glacier: An Interdisciplinary Study of Environmental System That Goes Catastrophically Wrong”, (KAZAKHSTAN INTAS-1835) 2003-2005.
- Effect of Changes in Climate, Snow Pack, Glaciers, and Permafrost on River Runoff in Tien Shan, Central Asia, NSF, ES# 0233583

COMPUTER SKILLS:

Programming: Fortran, C#, C++, Delphi, ArcObjects.