

CURRICULUM VITAE AND LIST OF PUBLICATIONS:

Sagy Cohen, PhD

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Professional Specialization: Geomorphology, Hydrology, Soil Science, Numerical Modeling, GIS, Remote Sensing.

Research Interests: Soil-landscape evolution modeling, River Fluxes, Global Sediment Dynamics, Landform Evolution modeling, Remote Sensing, Hydrology.

Education

PhD –2010 – The University of Newcastle- Environmental Engineering and Environmental Science

Name of advisors: Prof. Garry Willgoose and A/Prof. Greg Hancock

Title of thesis: Spatial Description of Soil Properties through Landscape-Pedogenesis Modelling.

M.A. - 2006 - Ben-Gurion University – Geomorphology and GIS

Name of advisors: Dr. Tal Svoray and Prof. John B. Laronne

Title of thesis: GIS based soil erosion potential model: the Shikma catchment case study.

B.A. - 2004 - Ben-Gurion University - Geography

Academic Employments

2012-present Assistant Professor – Department of Geography, University of Alabama, Tuscaloosa, USA.

2010-2012 Research Associate – CSDMS, INSTAAR, University of Colorado, Boulder, USA.

2010 Research Follow - Department of Geography & Environmental Development, Ben-Gurion University of the Negev, Israel.

2007-2009 Instructor – School of Environmental and Life Sciences, The University of Newcastle, Australia.

2006 Online Course Developer - Department of Geography & Environmental Development, Ben-Gurion University of the Negev, Israel.

2004-2006 Instructor - Department of Geography & Environmental Development, Ben-Gurion University of the Negev, Israel.

Academic Activities

Courses taught

- 1) Geography 101: Atmospheric Processes and Patterns – *BSc, BA* - University of Alabama, Geography
- 2) Geographic Information Systems, Tutor - *BSc* - The University of Newcastle, School of Environmental and Life Sciences
- 3) GIS and Remote sensing, Tutor - *BA* - The University of Newcastle, School of Environmental and Life Sciences
- 4) Short course- Introductory Cartography and GPS – IDF Air-Force Academy
- 5) Advanced systems in GIS, Online course builder and coordinator – *BA MA* - Ben-Gurion University of the Negev, Geography
- 6) Introduction to GIS , Tutor - *BA* - Ben-Gurion University of the Negev, Geography
- 7) Introduction to GIS , Tutor - *BA* – Achva Academic College, Geography
- 8) Introduction to Aerial Photographs, Tutor - *BA* - Ben-Gurion University of the Negev, Geography

Memberships in professional societies

CSDMS – Community Surface Dynamics Modeling System

AGU – American Geophysical Union

EGU - European Geosciences Union

Awards and Scholarships

- 2011 AGU Chapman Conference on Remote Sensing travel grant.
- 2009 University of Newcastle Faculty of Science and Information Technology RHD Conference Scholarship.
- 2007 University of Newcastle International postgraduate research scholarship (UNIPRS) and University of Newcastle postgraduate research scholarship external (UNRSE).
- 2006 Provisional University of Newcastle postgraduate research scholarship (UMRS External).
- 2005 Annual Conference of the Israeli Geographic Association Society – Third Prize Winner in the poster contest.
- 2004 ESRI award for special excellence in a GIS project implementation for an undergraduate student.
- 2004 Full time Scholarship for a Master degree in Ben-Gurion University of the Negev.

Professional Community Services

- Member in the Community of Surface Dynamic Modeling (CSDMS) Delta Force group.
- AGU fall meeting Outstanding Student Paper Award Judge.
- Roche Colorado Regional High School Science Fair Judge.

Research Funding

Funded Research Projects

Willgoose, G.R., McBratney, A., Hancock, G.R., Minasny, B., **Cohen S.**, A next generation spatially distributed model for soil profile dynamics and pedogenesis incorporating soil geochemistry and organic matter, 2011-2014, Australian Research Council. Award Amount: 365,000 AUD.

Declined Research Projects

Appiah-Opoku, S., Cordero Salas., **Cohen, S.**, Welfare Change and Opportunity Cost of Protected Areas: The Impact of Kakum National Park on Rural Livelihoods in Ghana, 2013-2016, NSF (Dynamics of Coupled Natural and Human Systems). Award Amount: \$395,312.

Cohen S., Brakenridge, G. R., De Groeve, T., Hong, Y., Kettner., A., Syvitski., J.P.M., Global River Discharge Community Cyberinfrastructure (GRDCC), 2012-2014 NASA (ROSES-2011). Award Amount: \$597,924.

Invited Lectures (Seminars)

- 1) March 26 2012 - Department of Geosciences, North Dakota State University, USA
- 2) March 9 2012 – Department of Geography, University of Alabama, USA
- 3) February 14 2012 – Department of Geosciences, Idaho State University, USA
- 4) November 1 2010 - The Institute of Arctic and Alpine Research (INSTAAR), University of Colorado at Boulder, USA
- 5) June 14 2010- Soil, Water and Environmental Sciences, Agricultural Research Organization - the Volcani Center, Israel
- 6) May 30 2010 - Geological Survey of Israel
- 7) May 11 2010 - The Jacob Blaustein Institutes for Desert Research, Ben-Gurion University of the Negev, Israel
- 8) April 14 2010 - Department of Geography and Environmental Development, Ben-Gurion University of the Negev, Israel
- 9) March 10 2010 - Department of Geography, The Hebrew University of Jerusalem, Israel

Scientific Publications

Refereed Journals Published

- 1) Brakenridge, G.R., **S. Cohen**, A.J. Kettner, and J.P.M. Syvitski (2012) Calibration of remote sensing river water discharge with a global water discharge model. *Journal of Hydrology*, <http://dx.doi.org/10.1016/j.jhydrol.2012.09.035>.
- 2) Nicholson, B.G., G.R. Hancock, **S. Cohen**, and G.R. Willgoose (2012), An assessment of the fluvial geomorphology of subcatchments in Parana Valles, Mars. *Geomorphology – special issue*, <http://dx.doi.org/10.1016/j.geomorph.2012.07.018>.
- 3) **Cohen, S.**, A. J. Kettner, J.P.M. Syvitski and B.M. Fekete (2011), WBMsed, a distributed global-scale riverine sediment flux model: Model description and validation, *Computers & Geosciences*, doi: 10.1016/j.cageo.2011.08.011
- 4) **Cohen, S.**, G. Willgoose, and G. Hancock (2010), The mARM3D spatially distributed soil evolution model: three-dimensional model framework, and analysis of hillslope and landform responses, *Journal of Geophysical Research*, 115, F04013, doi:10.1029/2009JF001536.
- 5) **Cohen, S.**, G. Willgoose, and G. Hancock (2009), The mARM spatially distributed soil evolution model: A computationally efficient modeling framework and analysis of hillslope soil surface organization, *Journal of Geophysical Research*, 114, F03001, doi:10.1029/2008JF001214.
- 6) **Cohen, S.**, G. Willgoose, and G. Hancock (2008), A methodology for calculating the spatial distribution of the area-slope equation and the hypsometric integral within a catchment, *Journal of Geophysical Research*, 113, F03027, doi: 10.1029/2007JF000820.
- 7) **Cohen, S.**, T. Svoray, J.B. Laronne, and Y. Alexandrov (2008). Fuzzy-based dynamic soil erosion model (FuDSEM): Modelling approach and preliminary evaluation. *Journal of Hydrology*, 356(1-2): 185-198. doi:10.1016/j.jhydrol.2008.04.010

Manuscripts in preparation or review or in press

- **Cohen, S.**, G.R. Willgoose, and G.R. Hancock, Soil response to late-Quaternary climatic oscillations, new insights based on numerical simulations. *Quaternary Research*, (accepted).
- **Cohen, S.**, A. J. Kettner, J.P.M. Syvitski, Global Suspended Sediment and Water Discharge Dynamics Between 1960-2010 based on the WBMsed v.2.0 Model. *Global and Planetary Change*, (under review).
- **Cohen, S.**, T., Svoray, S. Sela, G.R. Willgoose and G.R. Hancock, Sediment-transport control on semi-arid soil distribution based on numerical simulations of late Pleistocene and Holocene soil-landscape evolution. (in preparation).

Refereed Conference Papers

- 1) Willgoose, G. R., G. R. Hancock, and **S. Cohen** (2012), The potential role of pedogenesis modelling in digital soil mapping, in *Digital Soil Assessments and Beyond, Proceedings of the 5th Global Workshop on Digital Soil Mapping*, 10-13 April, 2012, edited by B. Minasny and A. B. McBratney, pp. 129-134, CRC Press, Sydney. ISBN: 978-0-415-62155-7
- 2) **Cohen, S.**, Willgoose G. R., and Hancock G., (2009), A new approach for large scale simulation of complex spatial processes: the 3D soil evolution model mARM. In R. Braddock et al. (eds) 18th IMACS World Congress - *MODSIM09 International Congress on Modelling and Simulation, December 2009*, pp. 74-80. ISBN: 978-0-9758400-7-8.
- 3) **Cohen, S.**, Willgoose G. R., and Hancock G., (2008), Soil armouring and weathering: toward catchment scale computational modelling. *Proceedings of the IAHS International Symposium, Sediment Dynamics in Changing Environments, 1-5 December 2008-Christchurch, New Zealand. IAHS Publication 325, ISSN 0144-7815*
- 4) **Cohen, S.**, Willgoose G. R., and Hancock G., (2008), Spatial relations between area-slope, hypsometry derived from a DEM and soils of the Goulburn catchment. *Proceedings of the 1st Global Workshop on High Resolution Digital Soil Sensing and Mapping, February 5-8, 2008- Sydney, Australia.*

Conference Session Convener

- Kettner, A.J., **Cohen, S.**, Syvitski, J.P.M., Vorosmarty, C., EP31A. Advances in Numerical Modeling of River Fluxes Under Changing Environmental Conditions. *Proceedings of the American Geophysical Union Fall meeting, December 2012- San Francisco, USA.*
- Elisabeth, B., **Cohen, S.**, Willgoose, G., Hancock, G., EP42D. Soil: The Terrestrial Critical Zone Biogeoreactor. *Proceedings of the American Geophysical Union Fall meeting, December 2012- San Francisco, USA.*
- Kettner, A.J., **Cohen, S.**, Brakenridge, G.R., Syvitski, J.P.M., H54E. Recent Advances in Remote Sensing and Modeling in Rivers and Streams for Understanding and Predicting Riverine Dynamics. *Proceedings of the American Geophysical Union Fall meeting, December 2011- San Francisco, USA.*

Conference Abstracts

- **Cohen, S.**, Kettner, A.J., Syvitski, J.P.M., 2012. A distributed analysis of Human impact on global sediment dynamics. *Proceedings of the American Geophysical Union Fall meeting, December 2012- San Francisco, USA.*
- Willgoose, G.R., **Cohen, S.**, Hancock, G.R., Saco, P.M., 2012. The co-evolution and spatial organization of soils, landforms, vegetation, and hydrology. *Proceedings of the American Geophysical Union Fall meeting, December 2012- San Francisco, USA.*
- **Cohen, S.**, G.R. Brakenridge, A.J. Kettner, J.P.M. Syvitski, B.M. Fekete and T., De Groeve (2012), Calibration of Orbital Microwave Measurements of River Discharge Using a Global Hydrology Model. *Proceedings of AGU Chapman Conference on Remote Sensing of the Terrestrial Water Cycle, February 2012- Kona, Hawaii, USA*
- **Cohen, S.**, Kettner, A.J., Syvitski, J.P.M., 2011. Global riverine sediment flux predictions, the WBMsed v2.0 model. *Proceedings of the American Geophysical Union Fall meeting, December 2011- San Francisco, USA.*
- Kettner, A.J., Overeem, I., **Cohen, S.**, Syvitski, J.P.M, 2011. Downscaling discharge variability: how well can daily flow characteristics be predicted based on lower resolution flow data?. *Proceedings of the American Geophysical Union Fall meeting, December 2011- San Francisco, USA.*
- Willgoose, G.R., Hancock, G.R., **Cohen, S.**, 2011. Co-evolution of Soils and Landforms: Erosion Modelling over Decadal Timescales for Disturbed Lands. *Proceedings of the American Geophysical Union Fall meeting, December 2011- San Francisco, USA.*
- **Cohen, S.**, Kettner, A.J., Syvitski, J.P.M., 2010. Improved water discharge predictions in WBMsed, a Global riverine Sediment Flux model. *CSDMS conference, Impact of time and process scales, October 2011- Boulder, Colorado*
- **Cohen, S.**, Kettner, A.J., Syvitski, J.P.M., 2010. Modeling global scale sediment flux, a new component in the spatially distributed Framework for Aquatic Modeling of Earth System (FrAMES). *Proceedings of the American Geophysical Union Fall meeting, December 2010- San Francisco, USA.*
- Willgoose, G.R., **Cohen, S.**, Svoray, T., Sela, S. and Hancock, G.R., 2010. Numerical simulation of geomorphic, climatic and anthropogenic drivers of soil distribution on semi-arid hillslopes. *Proceedings of the American Geophysical Union Fall meeting, December 2010- San Francisco, USA.*
- **Cohen, S.**, Kettner, A.J., Syvitski, J.P.M., 2010. Modeling global scale sediment flux, a new component in the spatially distributed Framework for Aquatic Modeling of Earth System (FrAMES). *CSDMS conference, Modeling for Environmental change, October 2010- San Antonio, Texas.*
- **Cohen, S.**, Willgoose G. R., and Hancock G., 2010. Using the mARM3D soil-landscape model to study the affect of climate dynamics on soil processes and properties, *Proceedings of the European Geosciences Union - General Assembly, 2 - 7 May 2010 - Vienna, Austria.*
- **Cohen, S.**, Willgoose G. R., and Hancock G., 2010. A modelling framework for spatially temporally explicit simulation of soil-landscape dynamics: the mARM3D model, *Proceedings of the European Geosciences Union - General Assembly, 2 - 7 May 2010 - Vienna, Austria.*
- Hancock, G., Coulthard, T., **Cohen, S.**, and Willgoose, G., 2010. Assessing the impact of increased rainfall variability on catchment scale sediment transport and water quality, *Proceedings of the European Geosciences Union - General Assembly, 2 - 7 May 2010 - Vienna, Austria.*
- **Cohen, S.**, Willgoose G. R., and Hancock G., 2009. Spatial and temporal trends in soil properties in response to Quaternary climate forcing: an assessment using the mARM3D soil evolution model.

Proceedings of the American Geophysical Union Fall meeting, 14-18 December 2009- San Francisco, USA.

- **Cohen, S.**, Willgoose G. R., and Hancock G., 2009. Simulating soil dynamics in landform evolution modeling: the mARM soil evolution framework. *Proceedings of the 7th International Conference on Geomorphology (ANZIAG), 6 - 11 July 2009 – Melbourne, Australia.*
- **Cohen, S.**, Willgoose G. R., and Hancock G., 2009. Catchment scale simulation of weathering-erosion coupling by the soil evolution model mARM. *Proceedings of the European Geosciences Union - General Assembly, 24 - 29 April 2009 - Vienna, Austria.*
- **Cohen, S.**, Willgoose G. R., and Hancock G., 2009. Catchment scale soil evolution model mARM: integrating dynamic soil properties in landform modelling. *Proceedings of the European Geosciences Union - General Assembly, 24 - 29 April 2009 - Vienna, Austria.*
- Hancock, G., Coulthard, T., Evans, K., Martinez., C., Willgoose, G., and **Cohen, S.**, 2009. Catchment scale soil erosion prediction using digital elevation based models-an assessment of approaches at the decadal to millennial time scales. *Proceedings of the European Geosciences Union - General Assembly, 24 - 29 April 2009 - Vienna, Austria.*
- **Cohen, S.**, Willgoose G. R., and Hancock G., 2008. Catchment Scale Simulation of Soil Evolution- the mARM Model: From Bedrock to Fully Developed Soils. *Proceedings of the American Geophysical Union Fall meeting, 15-19 December 2008- San Francisco, USA.*
- **Cohen, S.**, Willgoose G. R., and Hancock G., 2008. Large scale simulation of surface armouring and weathering. *Proceedings of the Australian and New Zealand Geomorphology Group conference, 10th - 15th February, 2008- Queenstown, Tasmania, Australia.*
- **Cohen, S.**, Svoray T. and Laronne J.B., 2005. Soil erosion modeling using GIS based on the fuzzy logic approach at a catchments scale. *Proceedings of the Fifth Annual Conference on Active Research by Environmental Science Students, 29 May 2005 - Rehovot, Israel.*
- **Cohen, S.**, T. Svoray & J.B. Laronne. 2005. Catchment scale soil erosion modeling using GIS and soft computing techniques. *Proceedings of the European Geosciences Union - General Assembly, 24 - 29 April 2005 - Vienna, Austria.*
- **Cohen, S.**, T. Svoray & J.B. Laronne. 2004. GIS based model for soil erosion potential: the Shikma catchment case study. *Proceedings of the Annual Conference of the Israeli Geographic Association Society, 12-14 December - Haifa, Israel.*