

# Maciej J. Soja

Ph.D. in Radio and Space Science

Date of birth: 1985-07-09  
Place of birth: Warsaw, Poland  
Citizenship: Polish, Swedish, Australian  
Current address: Roghorst 10, 6708KM Wageningen, Netherlands  
Telephone: +31 (0) 6 2886 4338  
E-mail: [maciej@mjsoja.com](mailto:maciej@mjsoja.com)  
Homepage: [www.mjsoja.com](http://www.mjsoja.com)



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## Employment

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### **Researcher (2022-)**

Wageningen Environmental Research, Wageningen University and Research, Wageningen, the Netherlands

### **Director and Head Researcher (2018-2021)**

M J Soja Consulting, West Hobart, Tasmania, Australia

### **Adjunct Researcher (2017-2021)**

School of Geography, Planning, and Spatial Sciences, University of Tasmania, Hobart, Tasmania, Australia

### **Research Assistant (2017-2019)**

School of Natural Sciences, University of Tasmania, Hobart, Tasmania, Australia

### **Senior Research Officer (2017-2018)**

Horizon Geoscience Consulting, Belrose, New South Wales, Australia

### **Research Assistant (2016-2017)**

Radar Remote Sensing Group, Department of Earth and Space Sciences, Chalmers University of Technology, Gothenburg, Sweden

### **Postdoctoral Researcher (2014-2016)**

Radar Remote Sensing Group, Department of Earth and Space Sciences, Chalmers University of Technology, Gothenburg, Sweden

### **Doctoral Student (2009-2014)**

Radar Remote Sensing Group, Department of Earth and Space Sciences, Chalmers University of Technology, Gothenburg, Sweden

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## Education

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***Ph.D. in Radio and Space Science, Chalmers University of Technology, Gothenburg, Sweden (2009-2014)***

Thesis title: "Modelling and Retrieval of Forest Parameters from Synthetic Aperture Radar Data"

***M.Sc. in Electrical Engineering, Chalmers University of Technology, Gothenburg, Sweden (2008-2009)***

Thesis title: "Electromagnetic Models for Bistatic Radar Scattering from Rough Surfaces with Gaussian Correlation Function"

***B.Sc. in Engineering Physics, Chalmers University of Technology, Gothenburg, Sweden (2005-2008)***

Thesis title: "Estimation of Biomass for Individual Trees using Airborne Laser Scanning" (with Viktor Kärnstrand and Erik Landström, in Swedish)

***High School Diploma in Natural Science, Västerhöjdsgymnasiet, Skövde, Sweden (2002-2005)***

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## International Project Participation

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- BIOMASS Level 2 Processor Suite, ESA ESTEC
- BIOMASS Level 2 Implementation Study, ESA ESTEC
- Technical Assistance in the Implementation of a C-band Convoy Mission Demonstration Campaign, ESA ESTEC Contract No. 4000117201/16/NL/FF/mc
- Information Content of Multi-Spectral SAR Data, ESA ESTEC Contract No. 4000115192/15/NL/AF/eg
- DUE GlobBiomass, ESA ESRIN Contract No. 4000113100/14/I-NB
- Advanced techniques for forest biomass and biomass change mapping using novel combination of active remote sensing sensors (Advanced SAR), European Union FP7, Grant Agreement 606971
- BIOMASS Processor Requirements Study, ESA ESTEC Contract No. 400011340/15/NL/FF/gp/10/NL/AF
- Study of L- and P-band SAR Tomography Synergies, ESA ESTEC Contract No. 4000112571/14/NL/FF/gp
- BioSAR 2010: Technical Assistance for the Development of Airborne SAR and Geophysical Measurements during the BioSAR 2010 Experiment, ESA ESTEC contract no. 4000102285/10/NL/JA/ef, 2011
- Development of Algorithms for Forest Biomass Retrieval, ESA ESTEC Contract No. 4200023081/10/NL/AF

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## Teaching Experience

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- Guest lecturer on radar for forest biomass monitoring in Advanced Earth Observation at Wageningen University
- Radar Systems and Applications, Remote Sensing, and Telecommunication (lab supervision, example classes, some lectures) at Chalmers University of Technology
- Guest lecturer on radar at University of Tasmania
- Sensing Planet Earth: From Core to Outer Space (MOOC at edx.org)
- BSc & MSc student supervision: Shrinivas Agashe (MSc, 2013), Rasmus Edvardsson & Filip Strand (BSc, 2016), Colm Keyes (MSc, 2022-23)
- Assistant PhD student supervisor: Ivan Huuva

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## Scientific Reviewer

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Remote Sensing of Environment, IEEE Transactions on Geoscience and Remote Sensing, IEEE Geoscience and Remote Sensing Symposium, Forests, Remote Sensing, IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing

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## Computer Skills

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Python, MATLAB, R, Mathematica, Linux, ENVI, QGIS, SNAP

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## Language Skills

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Fluent: Polish, Swedish, and English (IELTS: band 8).  
Basic: French and Dutch.

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## Other

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IEEE Member

Driver licence for car and motorcycle

PADI Advanced Open Water Diver

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## Publication Statistics

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*source: Google Scholar, 26 June 2023*

Publications: 16 in peer-reviewed journals  
Citations: 1078  
h-index: 17  
i10-index: 22

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## Selected Publications

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*Submitted, accepted, or published in peer-review journal papers (as of 26 Jan 2023):*

- [1] **Soja, M. J.**, Karlson, M., Bayala, J., Bazie, H. R., Sanou, J., Tankaoano, B., Eriksson, L. E. B., Reese, H., Ostwald, M., and Ulander, L. M. H., "Mapping tree height in Burkina Faso parklands with TanDEM-X", *Remote Sensing*, vol. 14, no. 13, July 2021
- [2] **Soja, M. J.**, Banda, F., d'Alessandro, M. M., Quegan, S., Scipal, K., Tebaldini, S., and Ulander, L. M. H., "Mapping Above Ground Biomass in Tropical Forests with Ground-Cancelled P-band SAR and Limited Reference Data", *Remote Sensing of Environment*, vol. 253, February 2021
- [3] Persson, H. J., **Soja, M. J.**, Fransson, J. E. S., and Ulander, L. M. H., "National Biomass Mapping using the Two-Level Model", *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, vol. 13, October 2020
- [4] Huuva, I., Persson, H. J., **Soja, M. J.**, Wallerman, J., Ulander, L. M. H., and Fransson, J. E. S., "Measurements of biomass change in a hemi-boreal forest based on multi-polarization L- and P-band SAR backscatter", *Canadian Journal of Remote Sensing*, vol. 46, no. 6, November 2020
- [5] d'Alessandro, M. M., Tebaldini, S., **Soja, M. J.**, Ulander, L. M. H., Quegan, S., and Scipal, K., "Interferometric Ground Cancellation for Above Ground Biomass Estimation", *IEEE Transactions on Geoscience and Remote Sensing*
- [6] Banda, F., d'Alessandro, M. M., Giudici, D., Le Toan, T., Papathanassiou, K., Quegan, S., Riembauer, G., Scipal, K., **Soja, M. J.**, Tebaldini, S., Ulander, L. M. H., and Villard, L., "The BIOMASS Level-2 Prototype Processor", *Remote Sensing*, vol. 12, no. 6, March 2020
- [7] Quegan, S., Le Toan, T., Chave, J., Dall, J., Exbrayat, J.-F., d'Alessandro, M. M., Paillou, P., Papathanassiou, P., Rocca, F., Saatchi, S. S., Scipal, K., Shugart, H., Smallman, T. L., **Soja, M. J.**, Tebaldini, S., Ulander, L. M. H., Villard, L., and Williams, M., "The European Space Agency BIOMASS mission: measuring forest above-ground biomass from space", *Remote Sensing of Environment*, vol. 207, 2019
- [8] **Soja, M. J.**, Persson, H. J., and Ulander, L. M. H., "Modeling and Detection of Deforestation and Forest Growth in Multi-Temporal TanDEM-X Data", *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, vol. 11, no. 10, October 2018, pp. 3548-3563.
- [9] Ulander, L. M. H., Monteith, A. R., **Soja, M. J.**, and Eriksson, L. E. B., "Multi-port Vector Network Analyzer Radar for Tomographic Forest Scattering Measurements", *IEEE Geoscience and Remote Sensing Letters*, vol. 15, no. 12, Dec. 2018, pp. 1897-1901
- [10] Blomberg, E., Ferro-Famil, L., **Soja, M. J.**, Ulander, L. M. H., & Tebaldini, S., "Forest Biomass Retrieval from L-band SAR using Tomographic Ground Backscatter Removal", *IEEE Geoscience and Remote Sensing Letters*, vol. 15, no. 7, July 2018

- [11] Persson, H. J., Olsson, H., **Soja, M. J.**, Ulander, L. M. H., & Fransson, J. E. S., "Experiences from Large-Scale Forest Mapping of Sweden using TanDEM-X Data", *Remote Sensing*, vol. 9, no. 1253, September 2017
- [12] **Soja, M. J.**, Askne, J. I. H., & Ulander, L. M. H., "Estimation of Boreal Forest Properties from TanDEM-X Data using Inversion of the Interferometric Water Cloud Model", *IEEE Geoscience and Remote Sensing Letters*, vol. 14, no. 7, pp. 997-1001, July 2017
- [13] Askne, J. I. H., **Soja, M. J.**, & Ulander, L. M. H., "Biomass Estimation in a Boreal Forest from TanDEM-X Data, Lidar DTM, and the Interferometric Water Cloud Model", *Remote Sensing of Environment*, vol. 196, pp. 265-278, July 2017
- [14] **Soja, M. J.**, Persson, H. J., & Ulander, L. M. H., "Estimation of Forest Biomass from Two-Level Model Inversion of Single-Pass InSAR Data", *IEEE Transactions on Geoscience and Remote Sensing*, vol. 53, no. 9, pp. 5083-5099, September 2015
- [15] **Soja, M. J.**, Persson, H. J., & Ulander, L. M. H., "Estimation of Forest Height and Canopy Density from a Single InSAR Correlation Coefficient", *IEEE Geoscience and Remote Sensing Letters*, vol. 12, no. 3, pp. 646-650, March 2015
- [16] Askne, J. I. H., Fransson, J. E. S., Santoro, M., **Soja, M. J.**, & Ulander, L. M. H., "Model-Based Biomass Estimation of a Hemi-Boreal Forest from Multitemporal TanDEM-X Acquisitions", *Remote Sensing*, vol. 5, no. 11, pp. 5574-5597, May 2013
- [17] **Soja, M. J.**, Sandberg, G., & Ulander, L. M. H., "Regression-Based Retrieval of Boreal Forest Biomass in Sloping Terrain using P-band SAR Backscatter Intensity Data", *IEEE Transactions on Geoscience and Remote Sensing*, vol. 51, no. 5, pp. 2646-2665, May 2013