

ANDREW J. MARX

Associate Professor of the Practice of Spatial Sciences and Creative Technologies
Spatial Sciences Institute, Dornsife College of Letters, Arts and Sciences
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POSITIONS

- Aug 2017 – Present Associate Professor of the Practice of Spatial Sciences, Spatial Sciences Institute, Dornsife College of Letters, Arts and Sciences, University of Southern California, Los Angeles, CA
- Apr 2015 – Aug 2017 Assistant Professor, Center for Information Systems & Technology, Claremont Graduate University, Claremont, CA
- Sep 2006 – Jan 2014 Foreign Affairs Analyst, U.S. Department of State, Office of the Geographer, Washington, DC
- Feb 2013 – May 2013 Research Fellow, Center for the Prevention of Genocide, U.S. Holocaust Memorial Museum, Washington, DC
- Jan 2010 – May 2012 Graduate Research Assistant, University of Maryland, College Park, MD
- Jan 2002 – Dec 2003 Graduate Research Assistant, University of California, Berkeley, CA
- Jun 1998 – Jun 2003 All-Source Analyst, U.S. Air Force, Various Locations.
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AFFILIATIONS

- Aug 2018 – Present Faculty Affiliate, Institute of Creative Technologies, DoD-University Affiliated Research Center with the U.S. Army Research Laboratory, USC
- Aug 2018 – Present Faculty Affiliate, USC Wrigley Institute for Environmental Studies, USC
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EDUCATION

Degrees

- 2009 – 2013 Ph.D. Geographical Sciences, University of Maryland, College Park, MD
- 2003 – 2005 Master City Planning, University of California, Berkeley, CA
- 1999 – 2002 M.A. Humanities, California State, Dominguez Hills, CA
- 1993 – 1997 B.S. Humanities, Air Force Academy, Colorado Springs, CO
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RESEARCH INTERESTS

Interdisciplinary geospatial and remote sensing analysis informing environmental and international policy
Analysis and visualization of spatiotemporal data in Python programming environments
Digital image processing and algorithm development of 2D and 3D UAS, aircraft and satellite imagery in opensource, ENVI IDL and Esri ArcPy Python computing environments
Development of cloud-based processing, rendering and delivery of 2D and 3D geospatial information

AWARDS

2020. “Connecting the Spread of COVID-19 with Satellite-based Mobility Metrics”. European Space Agency. **\$12,000**.

2020. “Improving Humanitarian Emergency Response with Cellphone Locational Data”. USC’s Undergraduate Research Associates Program. **\$3,000**.

2020. “Connecting the Spread of COVID-19 with Satellite-based Mobility Metrics”. USC’s Provost Undergraduate Research Fellowship. **\$3,000**.

2019. “Leveraging High-Cadence Data to Detect and Track Mass Migration”. USC’s Undergraduate Research Associates Program and Student Opportunities for Academic Research. **\$5,600**.

2018. “Development of Geospatial Techniques and Tools”. The Aerospace Corporation. **\$70,473**. (PI: 100%)

2018. “Smallsat Human Security Monitoring System”. USC Undergraduate Research Associates Program. **\$5,000**.

2018. Various satellite-based projects. USC’s Provost’s Undergrad Research Fellowships and Student Opportunities for Academic Research. **\$5,000**.

2018. “Evaluating Peer Effects of Turf Removal Program”. Metropolitan Water District of Southern California. **\$33,000**. (PI: 100%)

2017. “The Impact of Place in Rural Economic Mobility”. Fletcher Jones Foundation. **\$7,258**. (Co-PI: 50%)

2016. “Informing Conservation-Based Water Rate Structures in California through Remote Sensing”. Resources Legacy Fund. **\$72,426**. (PI: 100%)

2016. “Detecting Adjacency Effects of Turf Removal Rebates”. Metropolitan Water District of Southern California. **\$27,961**. (PI: 100%)

2016. “Southern California’s Response to the Drought: A Landcover Assessment”. Multon Niguel Water District. **\$32,536**. (PI: 100%)

2016. “LA’s Urban Forest Since 1985, Understanding the Drought through Historical Satellite Data”. U.S. Forest Service. **\$18,518**. (PI: 100%)

2016. “Improving Estimates of the Marian Cratering Rate”. Microsoft Azure. **\$20,000**. (PI: 100%)

2016. “Connecting Imagery-Based Data Science with Environmental Analysis”. Blais Challenge Award with the Claremont College’s Keck Sciences Department. **\$22,518**. (PI: 100%)

2016. “Developing Campus-Wide UAV (“drone”) Policy and Capacity.” Claremont University Consortium’s Consortial Fund for Cross-Campus Projects. **\$2,724** (Co-PI: 50%)

SERVICE

Faculty Merit Review Committee. University of Southern California, Spatial Sciences. (2019-Present).

Faculty Hiring Committee. University of Southern California, Spatial Sciences. (2017-2018).

Faculty Research Committee. Claremont Graduate University. (2016-2017).

Reviewer. Transactions in GIS (2019-Present).

Reviewer. ISPRS Journal of Photogrammetry and Remote Sensing (2016-Present).

Reviewer. International Journal of Remote Sensing (2015-Present)

PUBLICATIONS

Marx, A., (2020). Spectral Properties of Terrestrial Surfaces In *Geographic Information Science & Technology Body of Knowledge*. University Consortium for Geographic Information Science. *Under Review*.

Loyola, L., Knowles, J., Marx, A., McAlinden, R., Fleming, S. (2019). Research and Teaching Applications of Remote Sensing Integrated with GIS: Examples from the Field. **Journal of Geographic Information Systems**, Vol. 11 No. 6.

Marx, A., & McFarlane, D. (2019). Combining Unmanned Aerial Systems and Satellite Data to Monitor Phenological Changes in Tropical Forests: A Case Study from Costa Rica. **Case Studies in the Environment**.

Quesnel, K. J., Ajami, N., & Marx, A. (2019). Shifting landscapes: decoupled urban irrigation and greenness patterns during severe drought. **Environmental Research Letters**, 14(6), 064012.

Marx, A., Chou, Y. H., Mercy, K., & Windisch, R. (2019). A Lightweight, Robust Exploitation System for Temporal Stacks of UAS Data: Use Case for Forward-Deployed Military or Emergency Responders. **Drones**, 3(1), 29.

Marx, A., Windisch, R., & Kim, J. S. (2019). Detecting village burnings with high-cadence smallsats: A case-study in the Rakhine State of Myanmar. **Remote Sensing Applications: Society and Environment**, 14, 119-125.

Marx, A. J., (2017). Using Satellites to Detect Mass Human Rights Violations: A Call to Implement an Early-Warning Detection System In S. Totten (Ed.), *Last Lectures on the Prevention and Intervention of Genocide*, London, England: Routledge.

Marx, A. J. & Rogers, M. (2017). Analysis of Panamanian DMSP/OLS nightlights corroborates suspicions of inaccurate fiscal data. **Remote Sensing Applications: Society and Environment**, 8, 99-104.

Marx, A. J., et al. (2017). UAV data for multi-temporal Landsat analysis of historic reforestation: a case study in Costa Rica." **International Journal of Remote Sensing**: 1-18.

Lahza, H, Alhasawi, Y., & Marx, A. J. (2016). The Power of Social Media in Supporting Warehouse Location Decisions for Online Retailers Using GIS. **Proceedings of the 22nd ACIS**.

Marx, A. J. (2016). Detecting urban destruction in Syria: A Landsat-based approach. **Remote Sensing Applications: Society and Environment**, 4, 30-36.

Marx, A.J. (2013). Employing Moderate Resolution Sensors in Human Rights and International Humanitarian Law Monitoring. Retrieved from Digital Repository at UMD. (Pub No. 0117E 14359).

Marx, A. J. & Loboda, T. V. (2013). Landsat-based early warning system to detect the destruction of villages in Darfur, Sudan. **Remote Sensing of Environment**, 136, 126-134.

Marx, A.J. & Goward, S. (2013). Remote Sensing in Human Rights and International Humanitarian Law Monitoring: Concepts and Methods. **Geographical Review**, 103(1), 100-111.

Goward, S. N., Chander, G., Pagnutti, M., Marx, A., Ryan, R., Thomas, N., & Tetrault, R. (2012). Complementarity of ResourceSat-1 AWiFS and Landsat TM/ETM+ sensors. **Remote Sensing of Environment**, 123, 41-56.

SELECT COURSES

Spatial Computing

GIS Programming and Customization

Drones and UAVs for GIS

Environmental Applications of Drones and GIS

PROFESSIONAL AWARDS AND CERTIFICATIONS

Oct 2016: **FAA Remote Pilot Airman License**

Jun 2014: **Franklin Award:** Remote Sensing Research on Syrian Conflict

May 2012: **Meritorious Honor Award:** Sudan Survey Research

2008 – 2010: **Pat Roberts Intelligence Scholar's Program**

2006 – 2008: **Presidential Management Fellow**

SELECTED PRESS AND PRESENTATIONS

“Monitoring for Village Burnings with SmallSats: A Case-Study in Myanmar.” American Society for Photogrammetry and Remote Sensing Annual Conference. Baltimore, MD. 7 Oct 2019.

“Detecting Human Rights Violations with SmallSats.” URISA GIS-Pro Annual Conference. New Orleans, LA. 1 Oct 2019.

Bell, Susan. “Spatial scientists use satellite technology to detect and eventually prevent genocide.” USC Dornsife News. 1 Feb 2019.

Chin, Karly. “Keeping Green During Drought”. Water in the West. Stanford, CA. 6 June 2019.

“A light-weight, robust exploitation system for temporal 3D data.” NASA JPL Machine Learning Instrument Autonomy Group. 24 Jan 2019.

“AWS/Azure/GCP teaching and research use.” Esri Education Webinar Series. 5 Dec 2018.

“Geospatial Technology, Migration and Human Rights.” Oxford Consortium for Human Rights, Oxford, England. 27 July 2018.

Knickmeyer, Ellen. “In California, a \$350 Million Social Experiment over Lawns.” Associated Press. 31 October 2016.

“California Irrigated Landscape Algorithm.” Water Data Summit. Stanford Graduate School of Business, Stanford, CA. 9 September 2016.

Hernandez, Roberto. “Drones: Studying Reforestation in Costa Rica.” Flame Magazine. 1 July 2016.

“Pixel and Object-Based Classification: NAIP Irrigable Area Estimates.” Metropolitan Water District, Los Angeles, CA. 6 April 2016.

“Detecting Human Rights Violations in Syria; a Landsat-Based Approach.” American Association of Geographers, San Francisco, CA. 29 March 2016.

Hernandez, Roberto. “Collecting Visual Data with Drones”. Flame Magazine. 28 March 2016.

Hernandez, Roberto. “Detecting Human Rights Violations with Satellites”. Flame Magazine. 7 January 2016.

“Transdisciplinary Research Applying Big-Data, Big-Processing Approaches to NASA's Remotely-

Andrew J. Marx: Curriculum Vitae

Sensed Data.” Claremont Graduate University Board of Trustees, Claremont, CA. 3 December 2015.

“Time-Series Analysis of Earth Observatories for Activity Tipping and Queuing.” ENVI Analytics, Symposium, Boulder, CA. 26 August 2015.

Martinez, Barbara. “Spotting the Early Warning Signs of Humanitarian Crisis.” Holocaust Museum Magazine, Spring 2014. Vol. 2 No. 2.

Irons, James R. “Using Landsat to Detect Human Rights Violations.” Landsat Science. 30 October 2013.

Schutzberg, Adena. “Using Landsat Data to Detect, Rather than Confirm, Mass Human Rights Violations.” Directions Magazine: All Things Location. 10 October 2013.