Yi Qiang

Assistant Professor

School of Geosciences, University of South Florida

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Education

2012 **Ph.D. in Geography**, Department of Geography, Ghent University, Belgium

2007 **M.Sc. in Geographic Information Science**, University of Edinburgh, United Kingdom

2006 **B.Sc. in Geographic Information Systems** and **B.A. in Law** (Minor), Beijing Normal University, China

Appointments

2020 - now **Assistant Professor,** School of Geosciences**,** University of South Florida

2020 - now **Affiliate Faculty,** Dept of Geography and Environment**,** University of Hawai'i – Mānoa

2017 - 2020 **Assistant Professor,** Dept. of Geography and Environment**,** University of Hawai'i – Mānoa

2016 **Research Associate,** the Earth Lab, University of Colorado-Boulder

2013 - 2016 **Post-doctoral Researcher**, Dept. of Environmental Sciences, Louisiana State University

2007 **Research Assistant**, UK National e-Science Institute, University of Edinburgh

Publications

Peer-Reviewed Journals (*advised graduate student)

1. **Qiang, Y.**, Buttenfield, B., Xu, J.*, (2022) "Analyzing Multi-Scale Spatial Pattern in a Pyramid Modeling Framework". *Cartography and Geographic Information Science*. http://10.1080/15230406. 2022. 2048419
2. Yang, M., Zou, L., Cai, H., **Qiang, Y.**, Lin, B., Zhou, B., Abedin, J., Mandal, D. (2022). Spatial–Temporal Land Loss Modeling and Simulation in a Vulnerable Coast: A Case Study in Coastal Louisiana. *Remote Sensing*. vol.14 (4). DOI: https://doi.org/10.3390/rs14040896
3. Xu. J.*, **Qiang, Y.** (2021). "Spatial Assessment of Community Resilience from 2012 Hurricane Sandy using Nighttime Light". *Remote Sensing*. https://doi.org/10.3390/rs13204128
4. Xu. J.*, **Qiang, Y.** (2021). "Analysing Information Diffusion in Natural Hazards using Retweets -a Case Study of 2018 Winter Storm Diego" *Annals of GIS.* DOI: 10.1080/19475683.2021.1954086
5. Peng, B., Huang, Q., Vongkusolkit, J., Gao, S., Wright, D. B., Fang, Z. N., **Qiang, Y.** (2020). "Urban Flood Mapping with Bi-temporal Multispectral Imagery via a Self-supervised Learning Framework" *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing.* DOI: 10.1109/JSTARS. 2020.3047677
6. **Qiang, Y.**, Buttenfield, B. P., Joseph, M. B., (2020) "How to Measure Distance on a Digital Terrain Surface and Why it Matters in Geographical Analysis", *Geographical Analysis*. vol.53(3), pp. 588-622. DOI: 10.1111/gean.12255
7. **Qiang, Y.**, Huang, Q., Xu, J.*, (2020) "Observing Disaster Resilience from Space: Using Nighttime Light to Model Economic Disturbance and Recovery Pattern in Natural Disaster", *Sustainable Cities and Society*, vol.57. https://doi.org/10.1016/j.scs.2020.102115
8. **Qiang, Y.**, Xu. J.*, (2020) "Empirical assessment of road network resilience in natural hazards using crowdsourced traffic data", *International Journal of Geographical Information Science*, vol: 12(34) pp.2434-2450. DOI: 10.1080/13658816.2019.1694681

9. **Qiang, Y.**, Xu. J.*, Zhang, G., (2019) "The Shapes of US Cities: Revisiting the Classic Population Density Functions Using Crowdsourced Geospatial Data", *Urban Studies*. vol.57(10). DOI:10.1177/00420980 19871191
10. **Qiang, Y.** (2019) "Flood Exposure of Critical Infrastructure in the United States", *International Journal of Disaster Risk Reduction*. vol: 39, DOI:10.1016/j.ijdrr.2019.101240
11. **Qiang, Y.** and Van de Weghe, N. (2019) "Re-Arranging Space, Time and Scales in GIS: Alternative Models for Multi-Scale Spatio-Temporal Modeling and Analyses", *ISPRS International Journal of Geo-Information*. vol: 8(2). DOI:10.3390/ijgi8020072
12. **Qiang, Y.** (2019) "Disparities of Population Exposed to Flood Hazards in the United States", *Journal of Environmental Management*. vol: 232 (15). DOI:10.1016/j.jenvman.2018.11.039
13. **Qiang, Y.**, Shen, S., and Chen, Q. (2019) "Visibility Analysis of Oceanic Blue Space Using Digital Elevation Models", *Landscape and Urban Planning*. vol:181. DOI:10.1016/j.landurbplan.2018.09.019
14. Cai H., Lam NSN., **Qiang Y**., Zou L., Correll RM., Mihunov V. (2018). "A Synthesis of Disaster Resilience Measurement Methods and Indices" *International Journal of Disaster Risk Reduction*. vol: 31. DOI:10.1016/j.ijdrr.2018.07.015.
15. Cai H., Lam NSN., Zou L., **Qiang Y**. (2018). "Modeling the Dynamics of Community Resilience to Coastal Hazards Using a Bayesian Network." *Annals of the American Association of Geographers.* vol:108(5). DOI:10.1080/24694452.2017.1421896.
16. Lam, NSN., Xu, Y.J., Liu, K., Dismukes, D.E., Reams, M., Pace, R.K., **Qiang, Y.**, Narra, S., Li, K., Bianchette, T.A., Cai, H., Zou, L., Mihunov, V. (2018). "Understanding the Mississippi River Delta as a Coupled Natural-Human System: Research Methods, Challenges, and Prospects." *Water*. vol: 10(8). DOI:10.3390/w10081054.
17. Zou L., Lam NSN., Cai H., **Qiang Y.** (2018). "Mining Twitter Data for Improved Understanding of Disaster Resilience." *Annals of the American Association of Geographers.* vol: 108(5). DOI:10.1080/24694452.2017.1421897.
18. Lam, NSN., **Qiang Y.**, Li, K., Cai H., Zou, L and Mihunov, V. (2018) "Extending Resilience Assessment to Dynamic System Modeling: Perspectives on Human Dynamics and Climate Change Research". *Journal of Coastal Research*. vol: 85, pp:1401–1405. doi.org/10.2112/SI85-281.1.
19. **Qiang, Y.**, Lam, N., Zou, L. and Cai, H., (2017) "Changes in Exposure to Flood Hazards in the United States", *Annals of the American Association of Geographers*. vol: 107(6). DOI:10.1080/24694452. 2017.1320214
20. Li, X., Lam, N., **Qiang, Y.**, Li, K., Yin, L., Liu, S., and Zheng, W., (2016) "Measuring County Resilience after the 2008 Wenchuan Earthquake", *International Journal of Disaster Risk Science*. vol:7(4), DOI:10.1007/s13753-016-0109-2
21. **Qiang, Y**. and Lam, N., (2016) "The Impact of Hurricane Katrina on Urban Growth in Louisiana: An Analysis Using Data Mining and Simulation Approaches", *International Journal of Geographical Information Science.* vol:30(9). DOI:10.1080/13658816.2016.1144886
22. Bianchette, T., Liu, K., **Qiang, Y.**, and Lam, N., (2015) "Wetland accretion rates along coastal Louisiana: Spatial and temporal variability in light of Hurricane Isaac's impacts", *Water*. vol: 8(1). DOI:10.3390/w8010001
23. Cai, H., Lam, N., Zou, L., **Qiang, Y.**, Li, K., (2015) "Assessing Community Resilience to Coastal Hazards in the Lower Mississippi River Basin", *Water*. vol: 8(1). DOI:10.3390/w8020046
24. Zou, L., Kent, J., Lam, N., Cai, H., **Qiang Y.**, Li, K., (2015) "Evaluating Land Subsidence Rates and their Implications for Land Loss in the Lower Mississippi River Basin", *Water*. vol:8(1). DOI:10.3390/w8010010

25. Lam, N., **Qiang, Y.**, Arenas, H., Brito, P. and Liu, K., (2015) "Mapping and Assessing Coastal Resilience in the Caribbean Countries", *Cartography and Geographic Information Science*. vol:42(4). DOI: 10.1080/15230406.2015.1040999
26. **Qiang, Y.** and Lam, N., (2015) "Modeling Land Use and Land Cover Changes in a Vulnerable Coastal Region Using Artificial Neural Networks and Cellular Automata", *Environmental Monitoring and Assessment*. vol:187(3). DOI:10.1007/s10661-015-4298-8
27. Li, K., Lam, N., **Qiang, Y.**, Zou, L. and Cai H., (2015) "A Cyberinfrastructure for Community Resilience Assessment and Visualization", *Cartography and Geographic Information Science*. vol:42(s1). DOI:10.1080/15230406.2015.1060113
28. Chavoshi, S. H., De Beats, B., **Qiang, Y.,** De Tré, G., Neutens, T. and Van de Weghe, N., (2015) "A Qualitative Approach to the Identification, Visualisation and Interpretation of Repetitive Motion Patterns in Groups of Moving Point Objects", *International Arab Journal of Information Technology.* vol:12, no. 5, pp 415-423
29. Van de Weghe, N., De Roo, B., **Qiang, Y.**, Neutens, T. and De Maeyer, P., (2014) "The Continuous Spatio-Temporal Model (CSTM) as an Exhaustive Framework for Multi-Scale Spatio-Temporal Analysis", *International Journal of Geographical Information Science*. vol:28(5). DOI:10. 1080/13658816.2014.886329
30. **Qiang, Y**., Valcke, M., and Van de Weghe, N., (2014) "Representing Time Intervals in a Two-Dimensional Space: An Empirical Exploratory Study". *Journal of Visual Languages and Computing*. vol:25(4), pp 466-480. doi.org/10.1016/j.jvlc.2014.01.001
31. **Qiang, Y**., Chavoshi, S.H., Logghe, S., De Maeyer, P., and Van de Weghe, N. (2014) "Multi-scale Analysis of Linear Data in a Two-Dimensional Space", *Information Visualization*. vol:13(3), pp 248-265. DOI:10.1177/1473871612436775
32. **Qiang, Y.**, Delafontaine, M., Versichele, M., De Maeyer, P., and Van de Weghe, N., (2012) "Interactive Analysis of Time Intervals in a Two-Dimensional Space"*, Information Visualization*. vol:11(4). DOI:10.1177/1473871612436775
33. **Qiang, Y.**, Delafontaine, M., Neutens, T., Stichelbaut, B., De Maeyer, P., and Van de Weghe, N., (2012) "Analysing imperfect temporal information in GIS using the Triangular Model", *The Cartographic Journal*. vol:11(4). DOI:10.1179/1743277412Y.0000000008
34. **Qiang, Y.**, Delafontaine, M., Asmussen, K., Stichelbaut, B., De Tré, G., De Maeyer, P. and Van de Weghe, N. (2010) "Modelling Imperfect Time Intervals in a Two-Dimensional Space", *Control and Cybernetics*, vol:39(4).

Book Chapters

1. **Qiang, Y**. (2021) "Geospatial Analysis and Model Building". *The Geographic Information Science & Technology Body of Knowledge (1st Quarter 2020 Edition)*, John P. Wilson (ed.). DOI:10.22224 /gistbok/2021.1.12.
2. Yuan, Y., **Qiang, Y.**, Bin Asad, K., and Chow, T. E. (2020). "Point Pattern Analysis". *The Geographic Information Science & Technology Body of Knowledge (1st Quarter 2020 Edition)*, John P. Wilson (ed.). DOI: 10.22224/gistbok/2020.1.13.
3. Lam NS-N, Xu Y.J., Pace R.K., Liu, K.B., **Qiang, Y.**, Narra, S., Bianchette, T.A., Cai, H. (2019) "Collaboration Across Boundaries: Reflections on Studying the Sustainability of the Mississippi River Delta as a Coupled Natural-Human System". In: Perz SG (ed.) *Collaboration Across Boundaries for Social-Ecological Systems Science: Experiences Around the World*. Cham: Springer International Publishing, pp. 361–393. DOI: 10.1007/978-3-030-13827-1_11.

4. Brodaric, B., Reitsma, F. and **Qiang, Y.** 2007, "SKIing with DOLCE: toward an e-Science Knowledge Infrastructure", in *Formal ontology in information systems*, C Eschenbach, M Gruninger (ed.), Amsterdam, The Netherlands. pp. 208-219. ISBN: 978-1-58603-923-3

Conference proceedings

1. **Qiang, Y**, Barbara P. Buttenfield, Nina Lam, and Nico Van de Weghe. 2018. "Novel Models for Multi-Scale Spatial and Temporal Analyses." In *Proceedings of 10th International Conference on Geographic Information Science (GIScience 2018)*, edited by Stephan Winter, Amy Griffin, and Monika Sester, 114:55:1–55:7. DOI:10.4230/LIPIcs.GISCIENCE.2018.55.
2. Buttenfield, B., Ghandehari, M., Leyk, S., Stanislawski, L., Brantley, M. and **Qiang, Y.**, (2016) Measuring Distance "As the Horse Runs": Cross-Scale Comparison of Terrain-Based Metrics, In *proceedings of GIScience 2016*, Montreal, Canada, pp.41-44
3. De Tré, G., Bronselaer, A., Billiet, C., **Qiang, Y.,** Van de Weghe, N., De Maeyer, P., Enrique Pons, J., and Pons, O. (2012) Visualising and handling uncertain time intervals in a two-dimensional triangular space, In *proceedings of the 2nd world conference on soft computing*, Baku, Azerbaijan, pp.585-592
4. Asmussen,K., **Qiang, Y.**, De Maeyer, P., Van de Weghe, N. (2009). Triangular Model for Studying and Memorising Temporal Knowledge, In *proceedings of International Conference of Education, Research and Innovation*, Madrid, Spain. pp. 1849-1859.
5. **Qiang, Y.**, Reitsma, F. & Van de Weghe, N. (2009) Towards a General Temporal Ontology for Knowledge Integration, In *proceedings of the International Conference on Knowledge Engineering and Ontology Development*, Funchal. Portugal. pp. 275-280.
6. **Qiang, Y.**, Asmussen, K., Delafontaine, M., De Tré, G., Stichelbaut, B., De Maeyer, P. & Van de Weghe, N. (2009) Visualising rough time intervals in a two-dimensional space, In *proceedings of 2009 IFSA World Congress / EUSFLAT Conference*, Lisbon, Portugal. pp. 1480-1485

Presentations

1. "CroScalar: An Integrated Framework for Cross-Scale Spatio-Temporal Modeling" in the 2022 Annual Meeting of American Association of Geographers (virtual)
2. "Tracing the Curves of Rebound: Data-Driven Methods for Disaster Resilience Modeling" in the 2021 Annual Meeting of American Association of Geographers (virtual)
3. "Data-Driven Approaches to Analyze Geographic Disparities in Flood Exposure and Community Resilience" in the 2021 Annual Workshop of Initiative on Coastal Adaptation and Resilience (iCAR) (virtual)
4. "Big Data Approaches for Disaster Resilience Assessment" in the Fall Colloquium of School of Geosciences, University of South Florida, virtual, November, 2020
5. "Scales as Additional Dimensions in Space and Time" in the Scale and Spatial Analytics Workshop, Spatial Analysis Research Center (SPARC), Arizona State University, February, 2020.
6. "Tracing the Curves of Bouncing Back: Data Driven Methods for Assessing Disaster Resilience" in the Natural Resources & Environmental Management Research Seminar Series, University of Hawaii, Honolulu, HI, September 2019
7. "Spatio-Temporal Data Mining and Analyses in a Multi-Scale Framework" in the 2019 Annual Meeting of American Association of Geographers, Washington, DC, 2019
8. "Novel Models for Multi-Scale Spatial and Temporal Analyses" in the 10th International Conference of Geographical Information Science, Melbourne, Australia, August, 2018

9. “Physical Exposure and Social Sensitivity: Sea Level Rise Impacts to Transportation through Vulnerability Assessment and Social Media Analysis” in *2018 PRiMO Conference Technology and Disaster Risk Reduction*, Honolulu, Hawaii, August, 2018.
10. "Artificial Intelligence and Deep Learning in the Modeling of Coupled Natural and Human Dynamics” in 2018 *Annual Meeting of AAG*, New Orleans, LA, April, 2018
11. “A Systematic Evaluation of Surface-Adjusted Distance Measurements using a HPC-enabled Monte Carlo Simulation”, in *2017 Annual Meeting of AAG*, Boston, Massachusetts, April 2017.
12. “Modeling Long-Term Human Dynamics in Response to Natural Hazard Using Remote Sensing Data”, in *2016 Annual Meeting of AAG*, San Francisco, California, March 2016.
13. “High Performance Computing with Python for Geocomputation”, in *2015 AAG CyberGIS Workshop*, Chicago, Illinois, April 2015.
14. “Modeling the Coupled-Natural and Human Dynamics in a Vulnerable Coastal System Using CyberInfrastructure”, in *2015 annual meeting of the Association of American geographers*, Chicago, Illinois, April 2015.
15. “Modeling Land Use and Land Cover Changes in A Vulnerable Coastal Region Using Artificial Neural Network”, in *2014 annual meeting of the Association of American geographers*, Tampa, Florida, April 2014.
16. “Comparing the Land Use Land Cover Change between the South and North Louisiana Using Data Mining”, in *the 29th RSGIS workshop in Louisiana*, Lafayette, Louisiana, April 2013
17. “Multi-Scale Analysis of Linear Data in a Two-Dimensional Space”, in *workshop on space-time cube*, Enschede, the Netherlands, June 2012
18. “Visualising and analysing time series data in GIS”, in *Workshop of Geospatial Visual Analytics: Focus on Time (GeoVa(t))*, Guimarães, Portugal, May 2010
19. “Triangular Model for Studying and Memorising Temporal Knowledge”, in *the International Conference of Education, Research and Innovation*, Madrid, Spain, Nov. 2009
20. “Towards a General Temporal Ontology for Knowledge Integration”, in *the International Conference on Knowledge Engineering and Ontology Development*, Funchal. Portugal, Oct. 2009

Grants and Awards

1. (Pending) PI/PD: “ Collaborative Research: HNDS-I: A Cyberinfrastructure for Multiscale Human Dynamics and Resilience (HDR) Research”, submitted to NSF Human Networks & Data Science Infrastructure. $199,960. duration: 2022-2025. Collaborating with Louisiana State University, Texas A&M University and University of South California
2. PI/PD: “CoPe EAGER: Collaborative Research: A GeoAI Data-Fusion Framework for Real-Time Assessment of Flood Damage and Transportation Resilience by Integrating Complex Sensor Datasets”, funded by *NSF CoPe-Coastlines and People Program,* $40,000, duration 2020-2021, collaborating with University of Wisconsin-Madison and University of Texas at Arlington.
3. PI/PD: “Cross-Scale Spatiotemporal Modeling Using an Integrated Data Framework”, funded by *NSF Methodology, Measurement, and Statistic and Geography and Geospatial Science Program*, $350,000, duration: 2019 – 2022, with University of Hawaii - Manoa and University of Colorado – Boulder.
4. Co-PI: “Putting the farmer in the driver's seat: Integrative web tool for improved soil health and carbon assessment, monitoring, and planning”, funded by *US Department of Agriculture, National Institute of Food and Agriculture*, $449,035, duration 2018 – 2022, with PI Susan Crow and co-PI Johnathan Deenik (UH-Manoa)
5. Co-investigator: “Understanding the Socio-Ecological Drivers and Consequences of Seasonal Air Pollution”, funded by *NSF Cultural Anthropology Senior Research Program* (98-1390), $276,897,

duration 2018-2021, with PI Mary Mostafanezhad and co-PI Olivier Evrard (Institute of Research for Development, France).

6. Co-PI: "Physical Exposure and Social Sensitivity: Estimating Sea Level Rise Impacts to Transportation through Vulnerability Assessment and Social Media Analysis", funded by *University of Hawaii Pacific Southwest Region 9 University Transportation Center*, $40,207, duration 2017-2018, with PI Suwan Shen (UH-Manoa)

7. PI: "Who Own the Paradise: Using Supercomputer to Analyze Oceanview Inequality in Oahu", *Support of Undergraduate Research, College of Social Sciences at UH-Manoa*. $3,600, duration: 2017-2018.

8. PI: " Using Social Media Data to Analyze Spatial Zoning, Connectivity and Social Disparities in Honolulu", *Research Support Award, College of Social Sciences at UH-Manoa*. $20,318 duration: 2017-2018.

9. PI: "Using CyberGIS to Model the Coupled Natural and Human Dynamics in a Vulnerable Coastal System" funded by *CyberGIS Fellow Program*, duration: 2014-2015, $6,400, duration: 2014-2015.

10. Co-PI: "A Synthesis of Resilience Measurement Methods and Indices", funded by *Louisiana Sea Grant Program*, duration 2014 -2016, $49,940, duration: 2014-2016, with PI Nina Lam (Louisiana State University)

Courses Taught

- GIS-6100: Geographic Information Systems (USF)
- GIS-6307: Spatial Data Science (USF)
- GEO-4930: Geospatial Data Analytics (USF)
- GEOG-104: Digital Earth (UHM)
- GEOG-489: Applied GIS (UHM)
- GEOG-476: Web Mapping (UHM)
- GEOG-389: Geospatial Data Analytics (UHM)
- GEOG-388: Introduction to GIS (UHM)

Graduate Student Advising

Advising

1. Jinwen Xu, Ph.D. in Geography and Environmental Policy, USF (2018 - now)
2. Megan Grove, MA in Geography, USF (2021 - now)
3. Silvia Sulis, MA in Geography, UH-Manoa (graduated in 2019)

Serving in the committee

1. Yuzhou Chen, Ph.D. in Geography and Environmental Policy, USF
2. Shakhawat H. Tanim, Ph.D. in Geography and Environmental Policy, USF
3. Lauren Carter, Ph.D. in Geography and Environmental Policy, USF
4. Leilani Paxton, PhD in Geography and Environmental Science and Policy, USF
5. Nathan Shull, MA in Geography, USF
6. Keolohilani Lopes, MA in Geography, UH – Manoa
7. Ross Wians, MA in Geography, UH - Manoa
8. Derek Ford, MA in Geography, UH – Manoa
9. Qian Zhang, Ph.D. in Geography, UH - Manoa
10. Renee Setter, MA in Geography (graduated in 2020), UH – Manoa
11. Mehran Ghandehari, Ph.D. in Geography (graduated in 2019), University of Colorado - Boulder
12. Pengdong Zhang, Ph.D. in Geography (graduated in 2018), Ghent University, Belgium

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Invited Review

Research Proposals

U.S. National Science Foundation; The Research Grant Council (RGC) of Hong Kong;

Panel Review

NSF Mid-scale Research Infrastructure-1, NSF CSSI Program.

Journals

International Journal of Geographical Information Science; Annals of American Association of Geographers; Proceedings of the National Academy of Sciences (PNAS); Landscape and Urban Planning; Applied Geography; Scientific Report; Journal of Spatial Science; International Journal of Disaster Risk Reduction; Journal of Location Based Services; Geocarto International; Human and Ecological Risk Assessment: An International Journal; Environment Modeling & Assessment; IEEE Transactions on Fuzzy Systems; Agricultural Systems; Sustainability; Health Informatics Journal; Journal of Visual Languages and Computation; International Journal of Urban Sustainable Development; International Journal of Disaster Risk Reduction;