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PROFESSIONAL APPOINTMENTS

- 2016– **Assistant Professor** (Tenure Track), Department of Computer Science, University of Idaho
2014–2016 **Associate Research Scientist**, Tetherless World Constellation, Rensselaer Polytechnic Institute
2012–2014 **Postdoctoral Research Associate**, Tetherless World Constellation, Rensselaer Polytechnic Institute
2013 **Adjunct Faculty**, Dept. Earth & Environmental Sciences, Rensselaer Polytechnic Institute
2011–2012 **Researcher**, Earth Systems Science, ITC, University of Twente, the Netherlands
2008 **Visiting Scientist**, Geodata Interoperability, Geological Survey of Canada and York University

RESEARCH INTERESTS

- Design and implementation of models and knowledge graphs for complex systems in science
- Data interoperability and provenance enablement with participatory approaches and semantic technologies
- Exploratory analytics and visualization of spatio-temporal patterns in Big and Small Data

EDUCATION

- 2012–2014 **Postdoctorate**, Semantic eScience and Data Science, Rensselaer Polytechnic Institute
▪ Mentor: Peter Fox
2011 **Ph.D.**, Earth Systems Science & GIScience, ITC, University of Twente, the Netherlands
▪ Dissertation: Ontology Spectrum for Geological Data Interoperability
▪ Advisors: Freek van der Meer, Chonglong Wu, and John Carranza
2009 **Dr.Eng.** (*with distinction*), Geoinformatics Engineering, China University of Geosciences
2002 **B.Eng.** (*with distinction*), Land Resources Management, China University of Geosciences

RECENT HONORS, AWARDS & SCHOLARSHIPS (SINCE PHD)

- 2017 Guest Professor at China University of Geosciences, Wuhan
2016 Panelist, International Data Forum, Denver, CO
2016 Councilor (2016-2020), International Association for Mathematical Geosciences
2015 NSF-EarthCube Distinguished Lecturer
2015 Andrei Borisovich Vistelius Research Award, International Association for Mathematical Geosciences
▪ “*For promising contributions in applying mathematics or informatics in the earth sciences*”
2015 Best Paper Nomination, Conference on Empirical Methods in Natural Language Processing (EMNLP)
2015 Vespucci Institute 2015 - Spatial Ontologies for e-Science
2014 Inaugural WDS Data Stewardship Award, International Council for Science-World Data System
▪ “*For exceptional contributions to the improvement of scientific data stewardship*”
2013, 2012 Funding Friday Award, Federation of Earth Science Information Partners
▪ “*Rewards members who are looking to explore new collaborations and new ideas*”
2012 Councilor Nominee, International Association for Mathematical Geosciences
2011 Top 25 Hottest Articles (Jul.–Sept., 2011), Computers & Geosciences, Elsevier
2011–2015 Travel Grants awarded by: NSF-EarthCube (3), NSF-RDA (1), A.P. Sloan Fdn. (7), W.M. Keck Fdn. (3), USGS (1), Univ. of Oxford (1), Columbia Univ. (1), Smithsonian Inst. (1), UCLA (1), McGill Univ. (1), Ohio State Univ. (1), ICSU-WDS (1), Google (1), IAMG (1), ESIP (1), CODATA (2), Global Young Academy (1), CUG (2)

FUNDED PROJECTS

▪ PI or Co-PI

- 2017 **PI**, A Fresh Insight into the MILES Research Network towards Its Synthesis Stage, MILES Undergraduate Research and Internship (MURI) Program, \$4,500
2017 **PI**, Leveraging data science to explore co-relationships between elements and minerals, UI Office of Research and Economic Development (ORED) Seed Grant, \$11,795.57
2017 **PI**, CODATA Task Group on coordinating data standards amongst scientific unions, € 8,000

- 2017 **PI**, sub-grant from Idaho EPSCoR to support cyberinfrastructure construction in MILES program, \$ 26,830
- 2016 **PI**, New faculty member start-up funding from Idaho EPSCoR and UofI College of Engineering, \$ 150,000
- 2015 **Co-PI**, Sub-project of NSF ACI-1349002 Research Data Alliance: Deploying Research Data Alliance Data Type Registry and Persistent Identifier Information Types in the Deep Carbon Observatory Data Portal, PI: P. Fox, \$ 50,000
- 2015 **PI**, Foundation for Earth Science: An Entity Linking Service for Documents and Datasets in Earth and Environmental Sciences, \$ 7,000
- 2014 **Co-PI**, Alfred P. Sloan Foundation: Deep Carbon Observatory Data Science Day, PI: P. Fox, \$ 22,300
- 2014–2015 **Co-PI**, CODATA: Early Career Data Professionals Group, PI: T. Doko, € 10,000
- 2013–2014 **Co-PI**, Foundation for Earth Science: Semantic Similarity Computation and Concept Mapping in the Earth and Environmental Sciences, PI: J.G. Zheng, \$ 3,000
- 2012–2013 **PI**, Foundation for Earth Science: Exploratory Visualization of Earth Science Data in Semantic Web, \$ 5,000
- 2010–2011 **PI**, International Association for Mathematical Geosciences: IAMG Student Chapter at ITC, University of Twente, \$ 1,000
- 2008–2011 **PI**, ITC Research Fund: Ontology Spectrum for Geological Data Interoperability, € 60,000
- 2006–2007 **PI**, International Association for Mathematical Geosciences: 3D Visualization of Geologic Bodies and Kriging Method, \$ 2,000

▪ Project Leader

- 2015– W.M. Keck Foundation: Deep-Time Data Infrastructure – Data Science, PI: P. Fox, \$ 198,000
 ▪ *DTDI is a 10-year (2015-2025), \$10M project studying co-evolution of geo- and biospheres*
- 2012–2016 Alfred P. Sloan Foundation: Deep Carbon Observatory – Data Science, PI: P. Fox, \$ 1,500,000
 ▪ *DCO is a 10-year (2009-2019), \$500M global environmental reconnaissance project*
- 2012–2014 NSF UCAR S13-94358: Global Change Information System – Information Modeling and Semantic Application Prototype, PI: P. Fox, \$ 214,042
- 2012–2014 NSF ACI-0955649: INTEROP ECO-OP: Employing Cyber Infrastructure Data Technologies to Facilitate Integrated Ecosystem Approach for Climate Impacts in NE & CA Large Marine Ecosystems (#3 & #7), PI: P. Fox, \$ 1,089,337
- 2012–2014 NSF EAR-1240144: EarthCube Assessment of the 2012 State of Geoinformatics, PI: P. Fox, \$ 99,000

▪ Project Participant

- 2015–2016 NSF and UCAR: Extension to Global Change Information System (GCIS) Ontology, Co-PI: P. Fox
- 2012–2013 USGS: Coastal and Marine Spatial Planning Vocabularies, PI: P. Fox
- 2012–2013 DoE: Resource Discovery for Extreme Scale Collaboration (RDESC), Co-PI: P. Fox

PUBLICATIONS (*ADVISEE)

▪ Peer-Reviewed Journal Papers

1. **Ma, X.**, 2017. Linked Geoscience Data in practice: where W3C standards meet domain knowledge, data visualization and OGC standards. *Earth Science Informatics*, In press. <https://doi.org/10.1007/s12145-017-0304-8>
2. Chen, Q., Liu, G., **Ma, X.**, Li, X., He, Z., 2017. Fractal generator for efficient production of random planar patterns and symbols in digital mapping. *Computers & Geosciences*, 105, 91-102.
3. **Ma, X.**, West, P., Zednik, S., Erickson, J., Eleish, A., Chen, Y., Wang, H., Zhong, H., Fox, P., 2017. Weaving a knowledge network for Deep Carbon Science. *Frontiers in Earth Science*, 5, 36. <https://doi.org/10.3389/FEART.2017.00036> [open access]
4. **Ma, X.**, Erickson, J., Zednik, S., West, P., Fox, P., 2016. Semantic specification of data types for a world of Open Data. *ISPRS International Journal of Geo-Information*, 5(3), 38. <http://dx.doi.org/10.3390/ijgi5030038> [open access]
5. *Zheng, J.G., Fu, L.Y., **Ma, X.**, Fox, P., 2015. SEM+: Tool for discovering concept mapping in Earth science related domain. *Earth Science Informatics* 8 (1), 95–102.
6. **Ma, X.**, Fox, P., Narock, T., Wilson, B., 2015. Editorial: Semantic eScience. *Earth Science Informatics* 8 (1), 1–3.
7. **Ma, X.**, Fox, P., Tilmes, C., Jacobs, K., Waple, A., 2014. Capturing provenance of global change information. *Nature Climate Change* 4 (6), 409–413. <http://www.nature.com/nclimate/journal/v4/n6/full/nclimate2141.html>
8. **Ma, X.**, Zheng, J.G., Goldstein, J., Zednik, S., Fu, L., Duggan, B., Aulenbach, S., West, P., Tilmes, C., Fox, P., 2014. Ontology engineering in provenance enablement for the National Climate Assessment. *Environmental Modelling & Software* 61, 191-205.

9. **Ma, X.**, Fox, P., Rozell, E., West, P., Zednik, S., 2014. Ontology dynamics in a data life cycle: challenges and recommendations from a geoscience perspective. *Journal of Earth Science* 25 (2), 407–412.
10. **Ma, X.**, Fox, P., Mayernik, M.S., 2014. Strengthening an Interagency Network for Geoscience Data Sets: Report of Geodata 2014 Workshop. *Eos, Transactions American Geophysical Union* 95 (45), 411–411.
11. Tilmes, C., Fox, P., **Ma, X.**, McGuinness, D., Privette, A.P., Smith, A., Waple, A., Zednik, S., Zheng, J., 2013. Provenance representation for the National Climate Assessment in the Global Change Information System. *IEEE Transactions on Geoscience and Remote Sensing* 51 (11), 5160–5168.
12. **Ma, X.**, Fox, P., 2014. A jigsaw puzzle layer cake of spatial data. *Eos, Transactions American Geophysical Union* 95 (19), 161–161.
13. **Ma, X.**, Fox, P., 2013. Recent progress on geologic time ontologies and considerations for future works. *Earth Science Informatics* 6 (1), 31–46.
14. *He, Z., Kraak, M.-J., Huisman, O., **Ma, X.**, Xiao, J., 2013. Parallel indexing technique for spatio-temporal data. *ISPRS Journal of Photogrammetry and Remote Sensing* 78, 116–128.
15. **Ma, X.**, Carranza, E.J.M., Wu, C., van der Meer, F.D., 2012. Ontology-aided annotation, visualization and generalization of geological time scale information from online geological map services. *Computers & Geosciences* 40 (3), 107–119.
16. **Ma, X.**, Asch, K., Laxton, J.L., Richard, S.M., Asato, C.G., Carranza, E.J.M., van der Meer, F.D., Wu, C., Duclaux, G., Wakita, K., 2011. Data exchange facilitated. *Nature Geoscience* 4 (12), 814–814. <http://www.nature.com/ngeo/journal/v4/n12/full/ngeo1335.html>
17. **Ma, X.**, Carranza, E.J.M., Wu, C., van der Meer, F.D., Liu, G., 2011. A SKOS-based multilingual thesaurus of geological time scale for interoperability of online geological maps. *Computers & Geosciences* 37 (10), 1602–1615.
18. **Ma, X.**, Wu, C., Carranza, E.J.M., Schetselaar, E.M., van der Meer, F.D., Liu, G., Wang, X., Zhang, X., 2010. Development of a controlled vocabulary for semantic interoperability of mineral exploration geodata for mining projects. *Computers & Geosciences* 36 (12), 1512–1522.
19. **Ma, X.**, Carranza, E.J.M., van der Meer, F.D., Wu, C., Zhang, X., 2010. Algorithms for multi-parameter constrained compositing of borehole assay intervals from economic aspects. *Computers & Geosciences* 36 (7), 945–952.
20. **Ma, X.**, Wang, X., Wu, C., Ju, F., 2007. Metadata hierarchy in integrated geoscientific database for regional mineral prospecting. *Geo-spatial Information Science* 10 (3), 223–227.

• Edited Books and Journal Special Issues

1. **Ma, X.**, Fox, P., Narock, T., Wilson, B., (Eds.) 2015. Semantic e-Science. Special Issue of Earth Science Informatics, Volume 8, Issue 1, 146 pp.

• Books, Book Chapters and Encyclopedia Entries

1. **Ma, X.**, 2018. Spatial Data. In: Schintler, L.A., McNeely, C.L. (eds.) Encyclopedia of Big Data. Springer, Cham, Switzerland. In Press. http://dx.doi.org/10.1007/978-3-319-32001-4_192-1
2. **Ma, X.**, 2018. Metadata. In: Schintler, L.A., McNeely, C.L. (eds.) Encyclopedia of Big Data. Springer, Cham, Switzerland. In Press. http://dx.doi.org/10.1007/978-3-319-32001-4_135-1
3. **Ma, X.**, 2018. Visualization. In: Schintler, L.A., McNeely, C.L. (eds.) Encyclopedia of Big Data. Springer, Cham, Switzerland. In Press. http://dx.doi.org/10.1007/978-3-319-32001-4_202-1
4. **Ma, X.**, 2018. Data Repository. In: Schintler, L.A., McNeely, C.L. (eds.) Encyclopedia of Big Data. Springer, Cham, Switzerland. Under Review.
5. **Ma, X.**, 2018. Data-Information-Knowledge-Action Model. In: Schintler, L.A., McNeely, C.L. (eds.) Encyclopedia of Big Data Springer, Cham, Switzerland. Under Review.
6. **Ma, X.**, Beaulieu, S.E., Fu, L., Fox, P., Di Stefano, M., West, P., 2017. Documenting Provenance for Reproducible Marine Ecosystem Assessment in Open Science. In: Diviacco, P., Glaves, H.M., Leadbetter, A. (eds.) Oceanographic and Marine Cross-Domain Data Management for Sustainable Development. IGI Global, Hershey, PA, USA, pp. 100-126.
7. **Ma, X.**, Chen, Y., Wang, H., Zheng J.G., Fu, L., West, P., Erickson, J.S., Fox, P., 2015. Data visualization in the Semantic Web. In: Narock, T., Fox, P., (eds.) The Semantic Web in Earth and Space Science: Current Status and Future Directions. IOS Press, Berlin. pp. 149–167. [INVITED]
8. Wu, C., Liu G., Tian, Y., Mao, X., He, Z., Zhang, X., Liu, J., Weng, Z., Zhang, Z., Li, X., Li, Z., Xu, K., Kong, C., Li, X., Qi, G., **Ma, X.**, 2014. An Outline of Geological Information Science and Technology. Science Press, Beijing, China. 521 pp. (In Chinese)
9. **Ma, X.**, 2011. Ontology Spectrum for Geological Data Interoperability. PhD thesis, University of Twente, Enschede, The Netherlands, 184 pp. ISBN: 978-90-6164-323-4.

▪ **Recent Peer-Reviewed Conference Papers (last 5 years)**

1. Mou, X., Jamil, H., **Ma, X.**, 2017. VisFlow: A visual database integration and workflow querying system. Proceedings of the 33rd IEEE International Conference on Data Engineering (ICDE 2017). San Diego, CA, USA. 2pp. [Winner of Demo Paper Track]
2. **Ma, X.**, 2015. Geoinformatics in the Semantic Web. In: Schaeben, H., Delgado, R.T., van den Boogaart, K.G., van den Boogaart, R. (eds.) Proceedings of IAMG 2015, Freiberg, Germany, pp 18-26. [Andrei B. Vistelius Award Invited Article]
3. Tilmes, C., Wolfe, R.E., Duggan, B., Aulenbach, S., Goldstein, J.C., **Ma, X.**, Zednik, S., 2015. Supporting Trust with Provenance of the Findings of the National Climate Assessment. In: Proceedings of the Method Workshop at ISWC 2015, Bethlehem, PA. 4 pp.
4. **Ma, X.**, West, P., Erickson, J., Zednik, S., Chen, Y., Wang H., Zhong H., Fox, P., 2015. From data portal to knowledge portal: Leveraging semantic technologies to support interdisciplinary studies. In: Proceedings of the Diversity++ Workshop at ISWC 2015, Bethlehem, PA. 6 pp.
5. *Wang, H., Zheng, J.G., **Ma, X.**, Fox P., Ji, H., 2015. Language and Domain Independent Entity Linking with Quantified Collective Validation. Proceedings of the Conference on Empirical Methods in Natural Language Processing (EMNLP2015). 10 pp. [Best Paper Nomination]
6. **Ma, X.**, Fu, L., Fox, P., Liu, G., 2014. An integrated golden spike information portal enabled by data visualization and semantic web technologies. In: Proceedings of IAMG 2014, New Delhi, India, 5 pp.
7. **Ma, X.**, Chen, Y., Wang, H., Erickson, J.S., West, P., Fox, P., 2014. Deep Carbon Virtual Observatory: A cyber-enabled platform for linked science. In: Proceedings of SciDataCon2014, New Delhi, India, 3 pp.
8. **Ma, X.**, Carranza, E.J.M., Wu, C., van der Meer, F.D., 2011. Practicing an ontology spectrum for geological data interoperability. In: Proceedings of IAMG 2011, Salzburg, Austria, 14 pp.
9. **Ma, X.**, Carranza, E.J.M., van der Meer, F.D., Wu, C., 2010. Integrating data-flow analysis and object-oriented analysis for compositing of borehole metal-grade intervals. In: Proceedings of IAMG 2010, Budapest, Hungary, 9 pp.
10. Liu, G., Wu, C., **Ma, X.**, Wang, Y., Tian, F., 2009. Approach for interoperability of multi-source geological hazard data based on ontology and GeoSciML. In: Proceedings of Geoinformatics'09, Fairfax, USA, 7 pp.

▪ **Recent Conference Abstracts and Presentations (last 5 years)**

1. **Ma, X.**, Fox, P., Kolankowski, S., Hummer, D., Hazen, R.M., Golden, J.J., Meyer, M., 2017. Leveraging Data Science for Geoscience: Experience from the Deep Time Data Infrastructure. AbSciCon2017, Mesa, AZ, USA. [Invited]
2. Morrison, S.M., Downs, R.T., Golden, J.J., Pires, A.J., Fox, P.A., **Ma, X.**, Zednik, S., Eleish, A., Prabhu, A., Hummer, D., Liu, C., Meyer, M., Ralph, J., Hystad, G., Hazen, R.M., 2016. Exploiting mineral data: applications to the diversity, distribution, and social networks of copper mineral. AGU Fall Meeting, San Francisco, CA, USA.
3. Kolankowski, S., Fox, P., **Ma, X.**, Prabhu, A., 2016. Deep Time Data Infrastructure: Integrating our current geologic and biologic databases. AGU Fall Meeting, San Francisco, CA, USA.
4. **Ma, X.**, 2016. Semantic eScience: Leveraging Informatics and Semantic Web for Science. Idaho EPSCoR Annual Meeting, Coeur d'Alene, ID.
5. Hummer, D.R., Hazen, R.M., **Ma, X.**, Golden, J.J., Downs, R.T., Liu, C., Morrison, S.M., Meyer, M., 2016. Quantifying and visualizing earth's mineral chemistry through geologic time. GSA Annual Meeting, Denver, Colorado, USA.
6. Morrison, S.M., Downs, R.T., Golden, J.J., Pires, A.J., Fox, P., **Ma, X.**, Zednik, S., Eleish, A., Kolankowski, S., Hummer, D., Liu, C., Meyer, M., Ralph, J., Hystad, G., Hazen, R.M., 2016. Social network of copper minerals: a mineral ecology study. GSA Annual Meeting, Denver, Colorado, USA.
7. Kolankowski, S., Fox, P., **Ma, X.**, Zednik, S., 2016. Deep Time Data Infrastructure: integrating our current geologic and biologic databases. GSA Annual Meeting, Denver, Colorado, USA.
8. **Ma, X.**, Hummer, D., Hazen, R.M., Golden, J.J., Fox, P., Meyer, M., 2016. Showing co-relationships between elements and minerals in a three-dimensional matrix. GSA Annual Meeting, Denver, Colorado, USA.
9. Meyer, M., Downs, R.T., Falkowski, P.G., Fox, P., Hazen, R.M., Knoll, A.H., Sverjensky, D.A., Golden, J.J., Hao, J., Hystad, G., Hummer, D., Jelen, B., Kolankowski, S., Liu, C., **Ma, X.**, Moore, E.K., Morrison, S.M., Muscente, A.D., Pires, A.J., Zednik, S., Zhong, H., 2016. The co-evolution of the geo- and biospheres: an integrated program for data-driven, abductive discovery in the earth sciences. GSA Annual Meeting, Denver, Colorado, USA.
10. Morrison, S.M., Downs, R.T., Golden, J.J., Pires, A.J., Fox, P., **Ma, X.**, Zednik, S., Eleish, A., Kolankowski, S., Liu, C., Hummer, D., Meyer, M., Ralph, J., Hystad, G., Hazen, R.M., 2016. Mineral Ecology: social network analysis and sociograms of mineral connections, distributions, and segmentation. GSA Annual Meeting, Denver, Colorado, USA.
11. Hummer, D., Hazen, R., **Ma, X.**, Golden, J., Downs, R., 2016. Constraints on the Mineral Evolution of Planetary Crusts Using Statistical Correlations and Anti-Correlations Among the Mineral-Forming Elements. Goldschmidt 2016, Yokohama, Japan. Abstract No. 1207.

12. **Ma, X.**, Zheng, J.G., Wang, H., Fox, P., 2015. Illuminate Knowledge Elements in Geoscience Literature. AGU Fall Meeting 2015, San Francisco, CA. Oral presentation. [Invited]
13. *Kolankowski, S.M., Fox, P., **Ma, X.**, 2015. Database Integration: An Initial Step Towards the Deep-Time Data Infrastructure. AGU Fall Meeting 2015, San Francisco, CA. Poster.
14. West, P., Zednik, S., Fu, L., **Ma, X.**, Fox, P., 2015. Determining Fitness-For-Use of Ontologies Through Change Management, Versioning and Publication Best Practices. AGU Fall Meeting 2015, San Francisco, CA. Poster.
15. **Ma, X.**, Erickson, J.S., West, P., Zednik, S., Fox, P., 2015. Semantic Specification of Data Type Information in the Deep Carbon Observatory Data Portal. AGU Fall Meeting 2015, San Francisco, CA. Poster.
16. *Kolankowski, S.M., **Ma, X.**, Fox, P., 2015. Deep-Time Data Infrastructure: Integrating Our Current Geologic Databases. GSA 2015: Annual Meeting of the Geological Society of America 2015, Baltimore, MD. Poster.
17. **Ma, X.**, Erickson, J.S., West, P., Zednik, S., Fox, P., DCO-DS team, 2015. Adoption of RDA DTR and PID in the Deep Carbon Observatory Data Portal. RDA Sixth Plenary Meeting, Paris, France. Oral Presentation by P. Fox.
18. **Ma, X.**, Zheng, J.G., 2015. Linking Geoscience Entity Mentions to the Web of Data. ESIP Summer Meeting 2015, Pacific Grove, CA. Poster.
19. **Ma, X.**, 2015. Space and Time in Geology: Modeling and Encoding. Vespucci Institute 2015: Spatial ontologies for eScience. Bar Harbor, ME.
20. **Ma, X.**, Erickson, J.S., West, P., Zednik, S., Fox, P., Wang, H., Chen, Y. 2015. Formal Specification of Data Types in the Deep Carbon Observatory Data Portal. DCO International Science Meeting 2015, Munich, Germany. Poster.
21. Wang, H., Chen, Y., West, P., Erickson, J.S., **Ma, X.**, Fox, P. 2015. Beyond a Data Portal: A Collaborative Environment for the Deep Carbon Science Communities. DCO International Science Meeting 2015, Munich, Germany. Poster.
22. Fox, P., Erickson, J.S., West, P., **Ma, X.** 2015 Enabling the Science Network of DCO - Status and directions. DCO International Science Meeting 2015, Munich, Germany. Poster.
23. **Ma, X.**, Erickson, J., West, P., Zednik, S., Fox, P., 2015. Data types and persistent identifiers in the Deep Carbon Observatory Data Portal. RDA Fifth Plenary Meeting, San Diego, CA. Poster.
24. Zednik, S., **Ma, X.**, Erickson, J., West, P., Fox, P., 2015. Adoption of RDA DTR and PID in Deep Carbon Observatory Data Portal. RDA Fifth Plenary Meeting, San Diego, CA. Oral Presentation.
25. **Ma, X.**, 2014. Knowledge evolution in distributed geoscience datasets and the role of semantic technologies. AGU Fall Meeting 2014, San Francisco, CA. Oral Presentation. [INVITED]
26. *Fu, L., **Ma, X.**, West, P., Beaulieu, S., Di Stefano, M., Fox, P., 2014. Towards a common provenance model for research publications. AGU Fall Meeting 2014, San Francisco, CA. Poster.
27. Zednik, S., Fox, P., *Fu, L., West, P., **Ma, X.**, 2014. Linked Vocabulary API for the Earth Sciences Community. AGU Fall Meeting 2014, San Francisco, CA, USA, Abstract No. IN32A-07. Oral Presentation.
28. *Wang, H., *Chen, Y., West, P., Erickson, J.S., **Ma, X.**, Fox, P., 2014. DCO-VIVO: A collaborative data platform for the Deep Carbon Science Communities. AGU Fall Meeting 2014, San Francisco, CA. Poster.
29. **Ma, X.**, Chen, Y., Zheng J.G., Fu, L., Wang, H., Fox, P., 2014. Encoding meanings into maps and visualization: an example of semantically enhanced geologic map service. 2014 AAG Annual Meeting, Tampa, FL. Oral Presentation.
30. *Fu, L., **Ma, X.**, Zheng, J., Goldstein, J., Duggan, B., West, P., Aulenbach, S., Tilmes, C., Fox, P., 2014. Ontology development for provenance tracing in National Climate Assessment of the US Global Change Research Program. EGU General Assembly 2014, Vienna, Austria. Poster.
31. *Wang, H., Chen, Y., **Ma, X.**, West, P., Erickson, J.S., Hazen, R., Schiffries, C., Fox, P., 2014. User-aware multi-dimensional data exploration for Deep Carbon Observatory. EGU General Assembly 2014, Vienna, Austria. Poster.
32. **Ma, X.**, Fox, P., Tilmes, C., Beaulieu, S., West, P., Fu, L., Zheng, J. 2014. Deliberations of reusing the PROV Ontology for provenance capture in Earth and environmental sciences. ESIP 2014 Winter Meeting, Washington, DC. Poster presentation.
33. *Zheng, J., **Ma, X.**, Zednik, S., Fox, P. 2014. Semantic similarity computation and concept mapping in Earth and environmental science. ESIP 2014 Winter Meeting, Washington, DC. Poster. [INVITED]
34. **Ma, X.**, Zheng, J.G., Goldstein, J., Duggan, B., Xu, J., Du, C., Akkiraju, A., Aulenbach, S., Tilmes, C., Fox, P., 2013. Ontology development for provenance tracing in National Climate Assessment of the US Global Change Research Program. AGU Fall Meeting 2013, San Francisco, CA. Oral Presentation.
35. **Ma, X.**, Branch, D.B., Wegner, K., 2013. A justification for semantic training in data curation frameworks development. AGU Fall Meeting 2013, San Francisco, CA. Poster.
36. *Zheng, J.G., **Ma, X.**, Fox, P.A., 2013. Semantic similarity computation and concept mapping in earth and environmental science. AGU Fall Meeting 2013, San Francisco, CA. Poster.
37. *Wang, H., *Chen, Y., **Ma, X.**, Erickson, J.S., West, P., Fox, P., 2013. Semantically-enabled knowledge discovery in the Deep Carbon Observatory. AGU Fall Meeting 2013, San Francisco, CA. Poster.
38. *Chen, Y., *Wang, H., **Ma, X.**, Erickson, J.S., West, P., Fox, P., 2013. Indexable computation as a service in Deep Carbon Observatory. AGU Fall Meeting 2013, San Francisco, CA. Poster.

39. **Ma, X.**, Zheng, J.G., Goldstein, J., Aulenbach, S., Tilmes, C., Fox, P., 2013. Ontology engineering for provenance enablement in the third National Climate Assessment. ESIP 2013 Summer Meeting, Chapel Hill, NC. Poster.
40. **Ma, X.**, Fox, P., 2013. Form interoperability to interactivity: a test of exploratory visualization with semantic web technologies. ESIP 2013 Winter Meeting, Washington, DC. [INVITED]
41. **Ma, X.**, Fox, P., 2012. Exploratory visualization of earth science data in a Semantic Web context. AGU Fall Meeting 2012, San Francisco, CA. Oral Presentation.
42. **Ma, X.**, Fox, P., 2012. Beyond an image: using ontology and visualization to enrich Web Map Service for geosciences. ESIP 2012 Summer Meeting, Madison, WI. Poster.
43. **Ma, X.**, Carranza, E.J.M., Wu, C., van der Meer, F.D., 2011. Combining ontology and data visualization techniques to generate interactive map legends for online geological maps. EGU General Assembly 2011, Vienna, Austria, Poster.
44. **Ma, X.**, 2010. Modelling and approaching pragmatic interoperability of distributed geoscience data. EGU General Assembly 2010, Vienna, Austria, Oral Presentation.

• **Invited Lectures and Seminars (last 5 years)**

1. **Ma, X.**, Hodson, S., 2017. Open Science, FAIR Data and Data Standards. Workshop for Research Data Management at the 67th Annual Meeting of the American Crystallographic Association, New Orleans, LA.
2. **Ma, X.**, Zednik, S., Zhong, H., Kolankowski, S., West, P., Fox, P., 2016. Expressivity and Reasoning: Examples in Geologic Time and Mineral Observations. 2016 ESIP Summer Meeting, Durham, NC.
3. **Ma, X.**, Zheng, J.G., 2016. SEM+: a tool for concept mapping in geoscience. Ontology Summit: GeoScience and Semantic Interoperability Session, 2016-03-31.
4. **Ma, X.**, 2015. Geoinformatics in the Semantic Web. IAMG'15 Conference, Freiberg, Germany. [Andrei B. Vistelius Research Award Lecture]
5. **Ma, X.**, 2015. Science 3.0: Open Science in an Open World. Global Young Academy Annual Meeting, Montebello, QC, Canada.
6. **Ma, X.**, Zheng, J., 2015. An entity linking service for documents and datasets in Earth and environmental sciences, ESIP Testbed Showcase Webcast.
7. **Ma, X.**, 2015. Exploring the Web of Data for Earth and Environmental Sciences, McGill University, Montreal, Canada.
8. **Ma, X.**, 2015. Geodata sharing and application in the Semantic Web. China University of Geosciences, Wuhan, China.
9. **Ma, X.**, 2014. Why Data Science Matters. SciDataCon2014, New Delhi, India. [ICSU-WDS Data Stewardship Award Lecture]
10. **Ma, X.**, 2014. A formal geologic time model and its application for harmonizing heterogeneous geoscience information. The Deep-Time Data Workshop, San Francisco, CA.
11. Fox, P. **Ma, X.**, 2014. Deep-Time Data Infrastructure. The Deep-Time Data Workshop, San Francisco, CA.
12. Fox, P. **Ma, X.**, 2014. Deep-Time Data Infrastructure: A Socio-technical System. The Deep-Time Data Workshop, San Francisco, CA.
13. **Ma, X.**, 2014. Capturing and Presenting Provenance of Global Change Research. Tetherless World Constellation TWEd Talk Series 2014 Fall, Troy, NY.
14. **Ma, X.**, Chen, Y., Wang, H., West, P. Erickson, J., Fox, P., 2014. Deep Carbon Virtual Observatory: Leveraging data science to facilitate earth science research. DCO EPC Workshop. Los Angeles, CA.
15. **Ma, X.**, 2014. A Golden Spike Information Portal Enabled by Semantic Technologies and Data Visualization. Webinar - NSF EarthCube Collaboration and Cyberinfrastructure for Paleogeosciences.
16. **Ma, X.**, Chen, Y., Wang, H., West, P. Erickson, J., Fox, P., 2014. Why Data Science Matters and What We Can Do With It. DCO Summer School 2014. Big Sky, MT.
17. **Ma, X.**, 2014. Experience in Ontology Engineering with the Global Change Information System. April 2014 Webinar of ESIP Semantic Web Cluster.
18. **Ma, X.**, Chen, Y., Wang, H., West, P. Erickson, J., Fox, P., 2014. Deep Earth Computer: A Platform for Linked Science of the Deep Carbon Observatory Community. 2014 Deep Carbon Observatory Early Career Scientist Workshop, San José, Costa Rica.
19. **Ma, X.**, Chen, Y., Wang, H., West, P. Erickson, J., Fox, P., 2014. Technologies and Functionalities of the Platform for Linked Science of the Deep Carbon Observatory Community. 2014 Deep Carbon Observatory Early Career Scientist Workshop, San José, Costa Rica.
20. **Ma, X.**, DCO-Data Science Group, 2014. Data Sharing and Interoperability in the Deep Carbon Observatory. EarthCube Data Facilities Workshop, Arlington, VA.
21. **Ma, X.**, Zheng, J.G., Goldstein, J., Aulenbach, S., Tilmes, C., Fox, P., 2013. A Use Case-Driven Iterative Method for Building a Provenance-Aware GCIS Ontology. ESIP 2013 Summer Meeting, Chapel Hill, NC.
22. **Ma, X.**, Chen, Y., Wang, H., West, P. Erickson, J., Fox, P., 2013. Data Management Plans for the Deep Carbon Observatory: What, Why and How? Deep Carbon Observatory International Science Meeting, Washington, DC.

23. Fox, P. **Ma, X.**, DCO-DS Team, 2013. Deep Energy Science Discovery using DCO's Data Infrastructure, Management, and Science Network. DCO – Deep Energy Workshop, Manchester, UK.
24. **Ma, X.**, 2012. Geo-Informatics and the Semantic Web. Webinar for Purdue University.
25. **Ma, X.**, 2011. Ontology Spectrum for Geological Data Interoperability. China University of Geosciences, Wuhan, China.
26. **Ma, X.**, Carranza, E.J.M., van der Meer, F.D., Wu, C., 2010. Development of a SKOS-based Multilingual Thesaurus for Automatic Translation of Geological Time Scale Terms in Online Geological Maps. In: IUGS-CGI and OneGeology-Europe International Geoscience Language Workshop, Berlin, Germany.
27. **Ma, X.**, 2010. Building and Using Geoscience Thesauri. Geological Survey of the Netherlands, TNO, Utrecht, Netherlands.

TEACHING EXPERIENCE

- **Instructor**, CS 404/504 Semantic Web and Open Data, 3 credits (Fall 2017)
- **Instructor**, CS 404/504 Data Science, 3 credits (Spring 2017)
- **Instructor**, ISEM 301 The Beauty of Data Science, 1 credits (Spring 2017)
- **Instructor**, CS 600 Doctoral Research and Dissertation (Fall 2016, Spring 2017)
- **Instructor**, CS 502 DS: Semantic eScience, 3 credits (Spring 2017)
- **Instructor**, CS 500 Master's Research and Dissertation (Spring 2017)
- **Guest Lecturer**, Data Collection & Curation, ITEC 4350 Data Science, Rensselaer Polytechnic Institute (Spring 2013, Fall 2014)
- **Instructor**, Data Science, Deep Carbon Observatory Summer School (Summer 2014)
- **Guest Lecturer**, Geological Remote Sensing, EARTH 1100 Geology I: Earth's Interior, Rensselaer Polytechnic Institute (Fall 2013)
- **Full Instructor**, EARTH 4750 GIS in the Sciences, 4 credits, Rensselaer Polytechnic Institute (Spring 2013)
- **Teaching Assistant**, GIS for Geological Survey and Mapping, 3 credits, China University of Geosciences, Wuhan (Spring 2003, Spring 2004)

SUPERVISING AND ADVISING EXPERIENCE

- 2016– Major Professor
 PhD students: Abdullah Al-Owairdhi
 MSc Students: Bhuwan Madhikarmi
 Committee Member
 MSc Students: Afnan Alsharif
 Mentor
 Visiting Scholar: Chengbin Wang (Sept. 2016 to Sept. 2017)
 Research Assistant: Olivier Bizimana (Spring 2017)
 Undergraduate Research Intern: Timothy Sonnen (Summer 2017)
- 2015 Mentor for RPI Summer High School Research Program students: Kaleo Sato; Stephen Moon
 Advisor for RPI interns and RAs: Apurva Sinha (data type registry); Congrui Li (materials processing ontology); Sophie Kolankowski (deep time data modeling)
- 2014 Advisor for RPI interns and RAs: Sumithra Gnanasekar (data visualization), Lakshmi Chenicheri (data visualization), Ahmed Eleish (geosemantics)
- 2013 Advisor for RPI interns and RAs: Ali Nendick (data cleaning), Chengcong Du (linked data), Anusha Akkiraju (faceted data browsing), Jun Xu (knowledge network), Boliang Zhang (deep carbon science network), Harsha Venkata (knowledge graph), Mengyu Yin (faceted data browsing), Krishna Aradhi (geodata services)
- 2013–2016 Committee member of PhD research qualifier: Linyun Fu, Yu Chen, Han Wang, Benno Lee
 2012–2016 Mentor for RPI PhD students: Jin Guang Zheng, Linyun Fu, Yu Chen, Han Wang, Benno Lee, Congrui Li, Anirudh Prabhu, Hao Zhong, Ahmed Eleish; Master students: Sophie Kolankowski

EDITORIAL AND REVIEWING SERVICES

- Guest Editor:
- *Earth Science Informatics* (2015, special issue 'Semantic e-Science')
- Editorial Board Member:
- *Earth Science Informatics*, ▪ *Data Science Journal*, ▪ *International Journal of Information Retrieval Research*
- Reviewer for Journals and Books:
- *Data Science Journal*, ▪ *IEEE Transactions on Knowledge and Data Engineering*, ▪ *Informatics*, ▪ *Expert Systems with Applications*, ▪ *Cluster Computing*, ▪ *Semantic Web*, ▪ *International Journal on Semantic Web and*

Information Systems, ▪ *Journal of the Association for Information Science and Technology*, ▪ *Plos One*, ▪ *International Journal of Information Retrieval Research*, ▪ *International Journal of Applied Earth Observation and Geoinformation*, ▪ *Environmental Modelling & Software*, ▪ *International Journal of Geographical Information Science*, ▪ *International Journal of Digital Earth*, ▪ *ISPRS International Journal of Geo-Information*, ▪ *Computers & Geosciences*, ▪ *Computers, Environment and Urban Systems*, ▪ *Stochastic Environmental Research and Risk Assessment*, ▪ *Earth Science Informatics*, ▪ *Environmental Management*, ▪ *Transactions in GIS*, ▪ *GeoResJ*, ▪ *International Journal of Oil, Gas and Coal Technology*, ▪ *Indonesian Journal of Electrical Engineering*, ▪ *Spatial Cloud Computing: A Practical Approach (4 book chapters, 2013)*, ▪ *The Semantic Web in Earth and Space Science: Current Paths and Future Directions (1 book chapter, 2015)*, ▪ *Oceanographic and Marine Cross-Domain Data Management for Sustainable Development (2 book chapters)*

Reviewer for Conferences:

▪ *SciDataCon 2016 (10 abstracts)*, ▪ *AGU 2015 (Abstracts of 9 sessions)*, *AGU 2014 (38 abstracts)*, ▪ *AAG 2014 (5 abstracts)*, ▪ *AAAI 2014 (1 abstract)*, ▪ *AGU 2013 (25 abstracts)*, ▪ *Big Data in the Geosciences Workshop 2015 (1 abstract)*

Reviewer for Research Grant Programs

▪ *NASA Advancing Collaborative Connections for Earth System Science (ACCESS) Program*

Judge for Awards and Scholarships:

▪ *AGU 2015 ESSI Cluster OSPA Award Coordinator*, ▪ *2015 Sigma Xi Student Research Showcase*, ▪ *2014 Elsevier Computers & Geosciences Research Scholarship (36 proposals)*, ▪ *AGU 2014 Outstanding Student Presentation Award (OSPA) (6 presentations)*, ▪ *AGU 2013 OSPA Award (2 presentations)*, ▪ *AGU 2012 OSPA Award (1 presentation)*

PROFESSIONAL AND OUTREACH SERVICES

2017 Programme committee, CCKS 2017: Chinese Conference on Knowledge Graph and Semantic Computing, Chendu, China

2017– Technical Advisory Committee, Interdisciplinary Earth Data Alliance, Columbia University

2017 Hackathon Chair, The 9th ACM Web Science Conference, Troy, NY

2017– Representative of IUGS (International Union of Geological Sciences) to CODATA

2016 Co-chair of a Union Session, AGU Fall Meeting, San Francisco, CA

2016– Advisory Committee, Northwest Knowledge Network, University of Idaho

2016– Chair, CODATA – Task Group on Coordinating Data Standards amongst Scientific Unions

2016 Co-organizer, GeoVoCampDC2016, Washington, DC

2016 Programme committee, CCKS 2016: Chinese Conference on Knowledge Graph and Semantic Computing, Beijing, China

2016 Co-chair of a session, SciDataCon2016: Advance the Frontiers of Data in Research, Denver, CO

2016 Programme committee, SciDataCon2016: Advance the Frontiers of Data in Research, Denver, CO

2016 Co-organizer and Travel Stipends Committee Chair, First U.S. Semantics Symposium

2016 Organizer of the Keck Data Science Day Symposium, Troy, NY

2016 Co-organizer of 1 session, 2016 International Geological Congress

2015 Organizer of 4 sessions, Chair of 8 sessions, American Geophysical Union Fall Meeting 2015

2015 Program committee, Diversity++ Workshop, 2015 International Semantic Web Conference

2015 Organizer, Workshop of Smart Sharing with Microdata (rejected), 2015 Int'l Semantic Web Conference

2015 Program chair, Big Data in the Geosciences Workshop, 2015 IEEE International Conference on Big Data

2015 Organizer of 1 session, Association of American Geographers Annual Meeting 2015

2015 Organizer of 2 sessions, Federation of Earth Science Information Partners Winter Meeting 2015

2014 Organizer of 2 sessions, SciDataCon 2014

2014 Organizer and convener of 2 sessions; OSPA Award liaison of two sessions; Organizer of 4 other initial sessions, American Geophysical Union Fall Meeting 2014

2014 Chair of organizing committee; Moderator of 2 sessions, GeoData 2014 Workshop

2014 Chair of organizing committee; Co-Chair of workshop, DCO Data Science Day

2014 Organizer and chair of 1 session, Association of American Geographers Annual Meeting 2014

2014– Invited guest blogger for geoinformatics, data science and semantic web, ITC Alumni Blog

2013– Member, PROV-ES working group

2013 Organizer and co-convener of 1 session, American Geophysical Union Fall Meeting 2013

2013– Member, Geoscience Terminology Workgroup, Commission for Geoinformation, IUGS

2012 Coordinator, Semantic eScience meeting series, TWC/RPI

2011 Secretary, International Workshop on 3D City Models in E-Government

- 2010–2011 Coordinator, ISCI guest lecture series at ITC, University of Twente
- 2010–2011 Chair, IAMG student chapter at ITC, University of Twente
- 2010– Reporter for International Association for Mathematical Geosciences Newsletter
- 2010 Vice-chair, Faculty Council, ITC, University of Twente
- 2010 Board Member, ITC PhD student Committee, ITC, University of Twente
- 2007 Technical editor of proceedings, National Symposium of Geo-engineering Informatics, China
- 2007 Technical editor of program and abstracts, International Association for Mathematical Geosciences Annual Meeting 2007
- 2002–2004 Secretary General, Science and Technology Society of Graduate Students, China University of Geosciences, Wuhan

PROFESSIONAL SOCIETIES

- Spatial Statistics Society (2015–)
- Geological Society of London-Geoscience Information Group (2014–)
- Sigma Xi (Full Member, 2014–)
- Research Data Alliance (2014–)
- Implementing Organization of the International Geo Sample Number (2014–)
- CODATA-Early Career Data Professionals (2013–)
- American Geophysical Union (2012–)
- Federation of Earth Science Information Partners (2012–)
- International Cartographic Association (2010–)
- International Society for Photogrammetry and Remote Sensing (2010–)
- European Geosciences Union (2010–2011)
- IUGS-Commission for the Management and Application of Geoscience Information (Lifetime Member)
- International Association for Mathematical Geosciences (Lifetime Member)

OTHER PROFESSIONAL TRAINING

- EarthCube-EC3: Earth-Centered Communication for Cyberinfrastructure, one week field trip at Yosemite and Owens Valley, Summer 2015
- Preparing Future Faculty Seminar Series, Rensselaer Polytechnic Institute, Summer 2013 – Spring 2014
- Geo-ecosystem at Yellowstone: volcanic, geochemical, biological and tectonic aspects, two-day field work of DCO Summer School, Summer 2014
- Gas emission at Turrialba and Poás volcanoes: CO₂, SO₂, moisture and temperature data collection and analysis, Costa Rica, two-day field work, Spring 2014
- Penninic Tauern window in the Großglockner Area, Northern Alps, Austria: nappe stacks, metamorphic rocks and glaciers, one-day field trip, Summer 2011
- Tectonic and stratigraphic aspects of the Ordos basin, China, two-week field work, Summer 2009
- Spatial prediction models and their validation for natural hazard and resource potential mapping, half-day short course at IAMG2007 conference, China, Summer 2007