

Thomas J. Cova

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Education

- 1999 Ph.D., Geography, University of California Santa Barbara.
Dissertation: *A general framework for optimal site search.*
- 1995 M.A., Geography, University of California Santa Barbara.
Thesis: *A spatial search for neighborhoods that may be
difficult to evacuate.*
- 1986 B.S., Computer and Information Science, University of
Oregon. Minor in math; emphasis in software engineering.

Research and Teaching Interests

Environmental Hazards, Emergency Management, Geographic Information Science, Transportation, Sustainability, Coupled Natural-Human Systems.

Professional Experience

- 2012 – Professor, Department of Geography, University of Utah.
- 2005 – 2012 Associate Professor, Department of Geography, U. of Utah.
- 1999 – 2005 Assistant Professor, Department of Geography, U. of Utah.
- 1993 – 1996 Research Assistant, National Center for Geographic
Information and Analysis (NCGIA), UC Santa Barbara.
- 1992 – 1997 Teaching Assistant, Department of Geography, UCSB.
- 1987 – 1992 Systems Analyst, Matthew Bender & Co., Oakland, California.

Other Professional Activities

- 2014 – 2018 Director, *Certificate in Environmental Hazards & Emergency
Management*, Department of Geography, University of Utah.
- 2003 – 2018 Director, *Center for Natural & Technological Hazards*,
Department of Geography, University of Utah.

- 2001 – 2016 Director, Certificate in Geographic Information Science, Department of Geography, University of Utah.
- 2011 – 2013 Chair, Hazards, Disasters & Risk Specialty Group, Association of American Geographers, Washington, D.C.
- 2007 – 2008 Program Chair, 5th International Conference in Geographic Information Science (GIScience 2008), Park City, Utah.
- 2005 – 2008 Chair (Vice Chair, Past Chair), GIS Specialty Group, Association of American Geographers, Washington, D.C.
- 2005 – 2008 Chair, Research Projects Committee, University Consortium for Geographic Information Science (UCGIS).
- 2004 – 2006 Secretary/Treasurer, GIS Specialty Group, Association of American Geographers, Washington, D.C.
- 2001 – 2003 Academic Councilor, GIS Specialty Group, Association of American Geographers, Washington, D.C.
- 1999 – 2003 Associate Director for Research, Center for Natural & Technological Hazards, Department of Geography, U of Utah.

Editorial Board Memberships

- 2018 – *Journal of Applied Geography*
- 2011 – *Journal of Geography & Natural Disasters.*
- 2011 – 2014 *Journal of Spatial Science*
- 2009 – 2011 *Professional Geographer*, Sharmistha Bagchi-Sen (ed).
- 2001 – 2004 *Computers, Environment & Urban Systems*, P. Longley (ed).

Professional Honors and Awards

- 2016 Excellence in Mentoring Award, College of Social & Behavioral Science (CSBS), University of Utah.
- 2014 – 2016 Advisor, *Enabling the Next Generation of Hazards Researchers*, D. Thomas, S. Brody, & B. Gerber (PIs), National Science Foundation, CMMI-IMEE.
- 2008 – 2010 Mentor, *Enabling the Next Generation of Hazards Researchers*, Tom Birkland (PI), National Science Foundation, CMMI-IMEE.

- 2005 John I. Davidson Award for Practical Papers, American Society for Photogrammetry & Remote Sensing – with P. Sutton and D. Theobald.
- 2005 Leica Geosystems Award for Best Scientific Paper in Remote Sensing, American Society for Photogrammetry & Remote Sensing (ASPRS) – with P. Sutton and D. Theobald.
- 2003 – 2005 Fellow, *Enabling the Next Generation of Hazards Researchers*, Raymond Burby (PI), National Science Foundation, CMMI-IMEE.
- 2003 University Consortium for Geographic Information Science (UCGIS) Young Scholar's Award.
- 1996 – 1999 Dwight D. Eisenhower Doctoral Fellowship, National Highway Institute, Federal Highway Admin., Dept. of Transportation.
- 1995 International Geographic Information Foundation (IGIF) Award for Best Student Paper, GIS/LIS '95, Nashville, TN.
- 1995 Outstanding Student in Transportation, UC Santa Barbara, Western Coal Transportation Association.

RESEARCH AND SCHOLARSHIP

Edited volumes and special issues

- 2017 Cova, T.J. and Tsou, M., *GIS Methods and Techniques*. Vol 1. in *Comprehensive Geographic Information Systems, B*. Huang (EIC). Oxford: Elsevier.
- 2011 Cova, T.J. and Miles, S.B. (Eds). *Disaster Risk Reduction and Sustainable Development*, Sustainability (ISSN 2071-1050).
- 2008 Cova, T.J., Miller, H., Beard, K., Frank, A., Goodchild, M. (Eds.), *Geographic Information Science: 5th International Conference (GIScience 2008)*, Park City, Utah. Lecture Notes in Computer Science 5266, Springer-Verlag, Berlin.

Journal articles

(Student advisees underlined)

- 2018 Li, D., Cova, T.J., Dennison, P.E. Setting wildfire evacuation triggers by coupling fire and traffic simulation models: a spatio-temporal GIS approach. *Fire Technology*, 55: 617-642.

- 2017 Li, D., Cova, T.J., Dennison, P.E. Setting wildfire evacuation triggers using reverse geocoding. *Applied Geography*, 84: 14-27.
- 2017 Cova, T.J., Dennison, P.E., Li, D., Drews, F.A., Siebeneck, L.K., Lindell, M.K., Warning triggers in environmental hazards: who should be warned to do what and when? *Risk Analysis*, 37(4): 601-611.
- 2016 Nicoll, K.A., Cova, T.J., Siebeneck, L.K., Martineau, E. Assessing "preparedness elevated": seismic risk perception and household adjustment in Salt Lake City, Utah. *Journal of Geography & Natural Disasters*, 6: 168.
- 2015 Li, D., Cova, T.J., Dennison, P.E., A household-level approach to staging wildfire evacuation warnings using trigger modeling. *Computers, Environment, & Urban Systems*, 54:56-67.
- 2015 Drews, F.A., Siebeneck, L.K., Cova, T.J., Information search and decision making in computer based wildfire simulations. *Journal of Cognitive Engineering and Decision Making*. 9(3): 229-240.
- 2015 Hile, R. and Cova, T.J. (2015) Exploratory testing of an artificial neural network classification for enhancement of the social vulnerability index. *ISPRS International Journal of Geo-Information*, 4(4): 1774-1790.
- 2014 Drews, F.A., Musters, A., Siebeneck, L.K., and Cova, T.J. Environmental factors that affect wildfire protective-action recommendations. *International Journal of Emergency Management*, 10(2): 153-168.
- 2014 Siebeneck, L.K., and Cova, T.J. Risk communication after disaster: re-entry following the 2008 Cedar River Flood. *Natural Hazards Review*, 15: 158-166.
- 2014 Dennison, P.E., Fryer, G.K., and Cova, T.J., Identification of fire fighter safety zones using lidar, *Environmental Modelling and Software*, 59: 91-97.
- 2013 Fryer, G., Dennison, P.E. and Cova, T.J. Wildland firefighter entrapment avoidance: modeling evacuation triggers. *International Journal of Wildland Fire*, 22(7): 883-893.

- 2013 Cova, T.J., Theobald, D.M, Norman, J., and Siebeneck, L.K., Mapping wildfire evacuation vulnerability in the western US: the limits of infrastructure. *Geojournal*, 78(2): 273-285.
- 2012 Siebeneck, L.K. and Cova, T.J., Spatial and temporal variation in evacuee risk perception throughout the evacuation and return-entry process. *Risk Analysis*, 32(9), 1468-1480.
- 2011 Cova, T.J., Dennison, P.E., Drews, F.A., Modeling evacuate versus shelter-in-place decisions in wildfires. *Sustainability*, 3(10): 1662-1687.
- 2011 Cao, L., Cova, T.J., Dennison, P.E., and Dearing, M.D., Using MODIS imagery to predict hantavirus risk. *Global Ecology and Biogeography*, 20: 620-629.
- 2011 Kobayashi, T., Medina, R., and Cova, T.J., Visualizing diurnal population change in urban areas for emergency management. *Professional Geographer*, 63: 113-130.
- 2011 Larsen, J.C., Dennison, P.E., Cova, T.J., Jones, C. Evaluating dynamic wildfire evacuation trigger buffers using the 2003 Cedar Fire. *Applied Geography*, 3: 12-19.
- 2010 Pultar, E., Cova, T.J., Yuan, M., and Goodchild, M.F., EDGIS: a dynamic GIS based on space-time points. *International Journal of Geographical Information Science*, 24: 329-346.
- 2010 Moffatt, S.F. and Cova, T.J., Parcel-scale earthquake loss estimation with HAZUS: a case-study in Salt Lake County, Utah. *Cartography and Geographic Information Science*, 37: 17-29.
- 2010 Anguelova, Z., Stow, D.A., Kaiser, J., Dennison, P.E., Cova, T.J., Integrating fire behavior and pedestrian mobility models to assess potential risk to humans from wildfires within the US-Mexico border zone. *Professional Geographer*, 62: 230-247.
- 2009 Cova, T.J., Drews, F.A., Siebeneck, L.K. and Musters, A., Protective actions in wildfires: evacuate or shelter-in-place? *Natural Hazards Review*, 10(4): 151-162.
- 2009 Pultar, E., Raubal, M., Cova, T.J., Goodchild, M.F. Dynamic GIS case studies: wildfire evacuation and volunteered geographic information. *Transactions in GIS*, 13: 84-104.

- 2008 Siebeneck, L.K., and Cova, T.J., An assessment of the return-entry process for Hurricane Rita 2005. *International Journal of Mass Emergencies and Disasters*, 26(2): 91-111.
- 2007 Goodchild, M.F., Yuan, M., and Cova, T.J., Towards a theory of geographic representation. *International Journal of Geographical Information Science*, 21(3): 239-260.
- 2007 Kim, T.H., and Cova, T.J., Tweening grammars: deformation rules for representing change between discrete geographic entities. *Computers, Environment & Urban Systems*, 31(3): 317-336.
- 2007 Dennison, P.E., Cova, T.J., and Moritz, M.A., WUIVAC: A wildfire evacuation trigger model applied in strategic scenarios. *Natural Hazards*, 40, 181-199.
- 2007 VanLooy, J. and Cova, T.J., A GIS-based index for comparing airline flight path vulnerability to volcanoes. *Professional Geographer*, 59(1): 74-86.
- 2006 Sutton, P.C., Cova, T.J., Elvidge, C., Mapping "Exurbia" in the conterminous U.S. using nighttime satellite imagery. *Geocarto International*, 21(2): 39-45.
- 2006 Kim, T.H., Cova, T.J., and Brunelle, A., Exploratory map animation for post-event analysis of wildfire protective action recommendations. *Natural Hazards Review*, 7(1): 1-11.
- 2005 Cova, T.J., Dennison, P.E., Kim, T.H., and Moritz, M.A., Setting wildfire evacuation trigger-points using fire spread modeling and GIS. *Transactions in GIS*, 9(4): 603-617.
- 2005 Cova, T.J., Public safety in the urban-wildland interface: Should fire-prone communities have a maximum occupancy? *Natural Hazards Review*, 6(3): 99-108.
- 2004 Cova, T.J., Sutton, P.A, Theobald, D.M., Exurban change detection in fire-prone areas with nighttime satellite imagery. *Photogrammetric Engineering & Remote Sensing*, 70: 1249-1257.
- 2003 Cova, T.J., and Johnson, J.P., A network flow model for lane-based evacuation routing. *Transportation Research Part A: Policy and Practice*, 37: 579-604.

- 2002 Cova, T.J. and Johnson, J.P., Microsimulation of neighborhood evacuations in the urban-wildland interface. *Environment and Planning A*, 34: 2211-2229.
- 2002 Cova, T.J. and Goodchild, M.F., Extending geographic representation to include fields of spatial objects. *International Journal of Geographic Information Science*, 16: 509-532.
- 2000 Cova, T.J., and Church, R.L., Contiguity constraints for single-region site search problems. *Geographical Analysis*, 32: 306-329.
- 2000 Church, R.L., and Cova, T.J., Mapping evacuation risk on transportation networks with a spatial optimization model. *Transportation Research Part C: Emerging Technologies*, 8: 321-336.
- 2000 Cova, T.J., and Church, R.L., Exploratory spatial optimization in site search: a neighborhood operator approach. *Computers, Environment, & Urban Systems*, 24: 401-419.
- 2000 Radke, J., Cova, T.J., Sheridan, M.F., Troy, A., Lan, M., and Johnson, R., Application challenges for GIScience: implications for research, education, and policy for risk assessment, emergency preparedness and response, *Urban and Regional Information Systems Association (URISA) Journal*, 12: 15-30.
- 1997 Cova, T.J., and Church, R.L., Modeling community evacuation vulnerability using GIS. *International Journal of Geographical Information Science*, 8: 763-784.

Book Chapters and Sections

- 2017 Cova, T.J., Data model: o-fields and f-objects. The International Encyclopedia of Geography, 1-5.
- 2016 Cova, T.J., Evacuation Planning, in *Encyclopedia of Transportation*, SAGE Publications, M. Garrett (ed.), pp.
- 2004 Cova, T.J., and Conger, S., Transportation hazards, in *Handbook of Transportation Engineering*, M. Kutz (ed.), pp. 17.1-17.24.
- 1999 Cova, T.J., GIS in emergency management. In *Geographic Information Systems: Principles, Techniques, Applications*,

and Management, Longley, P., Goodchild, M.F., Maguire D., Rhind D. (eds), pp. 845-858.

Conference Papers and Posters

- 2015 Li, D., Cova, T.J., Dennison, P.E., An open-source software system for setting wildfire evacuation triggers. ACM SIGSPATIAL EM-GIS'15, November 3, 2015, Seattle, WA.
- 2013 Cova, T.J., Dennison, P.E., and Drews, F.A. Protective-action Triggers: Modeling and Analysis. *Natural Hazards Workshop*, University of Colorado, Boulder, July (poster).
- 2012 Cova, T.J., Dennison, P.E., and Drews, F.A. Protective-action Triggers. *Natural Hazards Workshop*, University of Colorado, Boulder, July (poster).
- 2012 Cova, T.J., Dennison, P.E., and Drews, F.A. Protective-action Triggers. National Science Foundation-CMMI Innovation Conference, Boston, July (poster).
- 2009 Siebeneck, L.K. and Cova, T.J. Current Research at the Center for Natural and Technological Hazards. *Natural Hazards Workshop*, U. of Colorado, Boulder, July (poster).
- 2008 Cova, T.J. et al., Protective actions in wildfire: the incident commander perspective. *Pacific Coast Fire Conference*, San Diego, November (poster).
- 2005 Yuan, M., Goodchild, M.F., Cova, T.J., Towards a general theory of geographic representation in GIS (poster). *Conference on Spatial Information Theory (COSIT) 2005*, Ellicottville, New York, September (poster).
- 2005 Kim, T.H., and Cova, T.J., Tweening Grammars: Deformation Rules for Representing Change between Discrete Geographic Entities. *Geocomputation 2005*, Ann Arbor, MI, August.
- 2001 Cova, T.J. and Johnson, J.P., Evacuation analysis and planning tools inspired by the East Bay Hills Fire, *California's 2001 Wildfire Conference: 10 years after the 1991 East Bay Hills Fire*, Oakland, October.
- 2001 Hepner, G.F., Cova, T.J., Forster, R.R., and Miller, H.J., Use of remote sensing and geospatial analysis for transportation hazard assessment: an integrated university, government and private sector consortium, *IEEE/ISPRS Joint Workshop*

on Remote Sensing and Data Fusion over Urban Areas Proceedings, IEEE-01EX482, Rome, Italy, pp.241-244.

- 2000 Atwood, G., and Cova, T.J., Using GIS and linear referencing to analyze the 1980s shorelines of Great Salt Lake, Utah, USA. *4th International Conference on Integrating GIS and Environmental Modeling (GIS/EM4): Problems, Prospects and Research Needs*. Banff, Alberta, Canada, September 2-8.
- 1997 Cova, T.J., and Church, R.L., An algorithm for identifying nodal clusters in a transportation network. *University Consortium for Geographic Information Science (UCGIS) Summer Retreat*, Bar Harbor, Maine, June 15-21.
- 1995 Cova, T.J., and Church, R.L., A spatial search for neighborhoods that may be difficult to evacuate, *Proceedings GIS/LIS '95*, ACSM/ASPRS, Nashville, TN, vol. 1, 203-212.
- 1995 Goodchild, M.F., Cova, T.J. and Ehlschlaeger, C., Mean geographic objects: extending the concept of central tendency to complex spatial objects in GIS, *Proceedings GIS/LIS '95*, ACSM/ASPRS, Nashville, TN, vol. 1, 354-364.
- 1994 Cova, T.J. and Goodchild, M.F., Spatially distributed navigable databases for intelligent vehicle highway systems, *Proceedings GIS/LIS '94*, ACSM, Phoenix, AZ, 191-200.

Other Publications

- 2018 Wei, R., Golub, A., Wang, L., Cova, T.J. *Evaluating and enhancing public transit systems for operational efficiency and access equity*. TREC Final Report, NITC-RR-1024.
- 2018 Wei, R., Golub, A., Wang, L., Cova, T.J. *Integrated performance measures: transit equity & efficiency*. TREC Final Report, NITC-RR-1024.
- 2008 Siebeneck, L.K. and Cova, T.J. Risk perception associated with the evacuation and return-entry process of the Cedar Rapids, Iowa flood. Quick Response Research Report, Natural Hazards Center, University of Colorado, Boulder.
- 2006 Cova, T.J., *Concerning Stonegate and Public Safety*. North County Times, San Diego, California, Nov. 3.
- 2002 Cova, T.J., Like a bat out of hell: simulating wildfire evacuations in the urban interface, *Wildland Firefighter Magazine*, November, 24-29.

- 2000 Cova, T.J., When all hell breaks loose: firestorm evacuation analysis and planning with GIS, *GIS Visions Newsletter*, August, The GIS Cafe.
- 2000 Cova, T.J. (2000) Wildfire evacuation. *New York Times letter to the Editor*, June 6.
- 1996 Church, R., Cova, T., Gerges, R., Goodchild, M., Conference on object orientation and navigable databases: report of the meeting. *NCGIA Technical Report 96-9*.
- 1994 Church, R., Coughlan, D., Cova, T., Goodchild, M., Gottsegen, J., Lemberg, D., Gerges, R., Caltrans Agreement 65T155, Final Report, *NCGIA Technical Report 94-6*.

Invited Lectures, Presentations and Participation

- 2019 "Public safety in the wildland-urban interface." Department of Geography, Texas A&M (TAMU), College Station, February.
- 2018 "ESRI Science Symposium." Panelist, ESRI Conference, San Diego, July.
- 2018 "Public safety in the wildland-urban interface." Living with Fire in California's Coast Ranges, Sonoma, May.
- 2017 "Improving situational awareness in wildfire evacuations with volunteered geographic information." NSF IBSS/IMEE Summer Workshop, San Diego, August.
- 2014 "Modeling adaptive warnings with geographic trigger points." Department of Geography, SDSU, San Diego, CA, April 18.
- 2013 "Wildfires and geo-targeted warnings." Geo-targeted Alerts and Warnings Workshop. *National Academy of Sciences*, Washington DC, February 21-22.
- 2012 "Evacuation planning in the wildland-urban interface." California Joint Fire Science Program, Webinar Speakers Series, September.
- 2010 "Evacuating threatened populations in disasters: space, time & information." University of Minnesota, Spatial Speakers Series (Geography/CS/CE), April.
- 2009 "The art and science of evacuation modeling." Utah Governor's Conf. in Emergency Management, Provo, May.

- 2008 "GIScience and public safety." Brigham Young University, November.
- 2007 "Fire, climate and insurance." Panel Discussion. Leonardo Museum, Salt Lake City, November.
- 2007 "GIScience and public safety." University of Northern Iowa, April.
- 2006 "Evacuation and/or Shelter in Place." Panel Discussion, Firewise Conference: Backyards & Beyond, Denver, CO, Nov.
- 2006 "Evacuation modeling and planning." Colorado Springs Fire Department, Colorado Springs, CO, October.
- 2006 "Evacuation modeling and planning." Sante Fe Complexity Institute, Sante Fe, NM, August.
- 2006 "Evacuation modeling and planning." Colorado Wildfire Conference. Vail, CO, April, \$1000.
- 2006 "Dynamic GIS: in search of the killer app." Center for Geocomputation, National U. of Ireland, Maynooth, April.
- 2006 "Setting wildfire evacuation trigger points with GIS." University Consortium for Geographic Information Science, Winter meeting, Washington, DC.
- 2005 "Setting wildfire evacuation trigger points with GIS." Pennsylvania State University, State College, PA, November.
- 2004 "The role of scale in ecological modeling," NSF PI meeting for Ecology of Infectious Diseases, Washington D.C., September.
- 2004 "The 2003 Southern California wildfires: Evacuate and/or or shelter-in-place," Natural Hazards Workshop, Boulder, CO.
- 2004 "When all hell breaks loose: new methods for wildfire evacuation planning," colloquium, Department of Geography, University of Denver, February.
- 2004 "When all hell breaks loose: new methods for wildfire evacuation planning," Colorado Governor's Conference and Colorado Emergency Management Association (CEMA) Conference, Boulder, CO, February.

- 2004 "When all hell breaks loose: new methods for wildfire evacuation planning," colloquium, Department of Geography, University of California Los Angeles, February.
- 2003 "When all hell breaks loose: new methods for wildfire evacuation planning," colloquium, Natural Resources Ecology Lab (NREL), Colorado State University, April.
- 2003 "When all hell breaks loose: new methods for wildfire evacuation planning," Departmental colloquium, Department of Geography, University of Arizona, January.
- 2002 "When all hell breaks loose: new methods for wildfire evacuation planning," Departmental colloquium, Department of Geography, Western Michigan University, November.
- 2001 "Regional evacuation analysis in fire-prone areas with limited egress," Departmental colloquium, Department of Geography, University of Denver, May.
- 2000 "Integrating Site Search Models and GIS," Colloquium, Department of Geography, Arizona State University, Feb.
- 1999 "Site Search Problems and GIS," Colloquium, Department of Geography, University of Utah.
- 1996 "A spatial search for neighborhoods that may be difficult to evacuate," Colloquium, Department of Geography, UC Santa Barbara.
- 1995 "A spatial search for neighborhoods that may be difficult to evacuate," Regional Research Lab, Bhopal, India.
- 1995 "A spatial search for neighborhoods that may be difficult to evacuate," Indian Institute of Technology, Bombay. India.

Papers Presented at Professional Conferences

- 2018 Cova, T.J., GIScience & Emergency Management: where do we go from here? Association of American Geographers Annual Meeting, New Orleans, LA, April.
- 2017 Cova, T.J., Simulating warning triggers. Association of American Geographers Annual Meeting, Boston, MA, CA, April.

- 2016 Cova, T.J., Spatio-temporal representation in modeling evacuation warning triggers. Association of American Geographers Annual Meeting, San Francisco, CA, March.
- 2015 Cova, T.J. and Jankowski, P., Spatial uncertainty in object-fields: the case of site suitability. Association of American Geographers Annual Meeting, Chicago, IL, April.
- 2014 Cova, T.J. and Jankowski, P., Spatial uncertainty in object-fields: the case of site suitability. International Conference on Geographic Information Science (GIScience '14), Vienna, Austria, September.
- 2013 Cova, T.J., Dennison, P.E. and Drews, F.A., Protective-action triggers: modeling and analysis. *Association of American Geographers Annual Meeting*, Los Angeles, CA, April.
- 2012 Cova, T.J., Dennison, P.E. and Drews, F.A., Protective-action triggers. Poster presented at the Natural Hazards Workshop, University of Colorado, Boulder, July.
- 2012 Cova, T.J., Dennison, P.E. and Drews, F.A., Protective-action triggers. Poster presented at the NSF CMMI Innovation Conference, Boston, July.
- 2012 Cova, T.J., Dennison, P.E. and Drews, F.A., Protective-action triggers, *Association of American Geographers Annual Meeting*, New York, NY, February.
- 2011 Cova, T.J., Modeling stay-or-go decisions in wildfires, *Association of American Geographers Annual Meeting*, Seattle, WA, April.
- 2010 Cova, T.J., Theobald, D.M. and Norman, III, J., Mapping wildfire evacuation vulnerability in the West, *Association of American Geographers Annual Meeting*, Wash. D.C., April.
- 2010 Cova, T.J., and Van Drimmelen, M.N., Family gathering in evacuations: the 2007 Angora Wildfire as a case study. *National Evacuation Conference*, New Orleans, February.
- 2010 Siebeneck, L.K., Cova, T.J., Drews, F.A., and Musters, A. Evacuation and shelter-in-place in wildfires: The incident commander perspective. *Great Basin Incident Command Team Meetings*, Reno, April.

- 2009 Cova, T.J. et al., Protective action decision making in wildfires: the incident commander perspective. *Association of American Geographers Annual Meeting*, Las Vegas, March.
- 2009 Siebeneck, L.K. and Cova, T.J. Using GIS to explore evacuee behavior before, during and after the 2008 Cedar Rapids Flood. *Association of American Geographers Annual Meeting*, Las Vegas, March.
- 2009 Lindell, M.K., Prater, C.S., Siebeneck, L.K. and Cova, T.J. Hurricane Ike Reentry. *National Hurricane Conference*, Austin, March.
- 2008 Cova, T.J., Simulating evacuation shadows, *Association of American Geographers Annual Meeting*, Boston, April.
- 2007 Cova, T.J., An agent-based approach to modeling warning diffusion in emergencies, *Association of American Geographers Annual Meeting*, San Francisco, March.
- 2006 Cova, T.J., New GIS-based measures of wildfire evacuation vulnerability and associated algorithms. *Association of American Geographers Annual Meeting*, Denver, March.
- 2005 Cova, T.J., Dennison, P.E., Kim, T.H., and Moritz, M.A., Setting wildfire evacuation trigger-points using fire spread modeling and GIS. *Association of American Geographers Annual Meeting*, Denver, March.
- 2004 Cova, T.J., Sutton, P.C., and Theobald, D.M. Light my fire proneness: residential change detection in the urban-wildland interface with nighttime satellite imagery, *Association of American Geographers Annual Meeting*, Philadelphia, March.
- 2004 Cova, T.J. and Johnson, J.P., A network flow model for lane-based evacuation routing. *Transportation Research Board (TRB) Annual Conference*, Washington, D.C., January.
- 2003 Cova, T.J. Lane-based evacuation routing, *Association of American Geographers Annual Meeting*, New Orleans, March.
- 2002 Cova, T.J., Extending geographic representation to include fields of spatial objects, *GIScience 2002*, Boulder, September.

- 2002 Husdal, J. and Cova, T.J., A spatial framework for modeling hazards to transportation systems, *Association of American Geographers Annual Meeting*, Los Angeles, March.
- 2001 Cova, T.J. and Johnson, J.P., Evacuation analysis and planning tools inspired by the East Bay Hills Fire, *California's 2001 Wildfire Conference: 10 years after the 1991 East Bay Hills Fire*, Oakland, October.
- 2001 Cova, T.J., Husdal, J., Miller, H.J., A spatial framework for modeling hazards to transportation networks, *Geographic Information Systems for Transportation Conference (GIS-T 2001)*, Washington DC, April.
- 2001 Cova, T.J., Miller, H.J., Husdal, J., A spatial framework for modeling hazards to transportation systems, *Association of American Geographers Annual Meeting*, New York, New York, February.
- 2000 Cova, T.J., Church, R.L., Goodchild, M.F., Extending geographic representation to include fields of spatial objects, *GIScience 2000*, Savannah, Georgia, November.
- 2000 Cova, T.J. Microscopic simulation in regional evacuation: an experimental perspective, *Association of American Geographers Annual Meeting*, Pittsburgh, Pennsylvania, March.
- 1999 Cova, T.J., and Church, R.L., "Exploratory spatial optimization and site search: a neighborhood operator approach," *Geocomputation '99*, Mary Washington College, Fredricksburg, Virginia.
- 1999 Cova, T.J., and Church, R.L., "Integrating models for optimal site selection with GIS: problems and prospects," *Association of American Geographer Annual Meeting*, Honolulu, Hawaii, March 29.
- 1998 Cova, T.J., and Church, R.L., "A spatial analytic approach to modeling neighborhood evacuation egress," *Association of American Geographers Annual Meeting*, Boston, Massachusetts.
- 1997 Church, R.L., and Cova, T.J., "Location search strategies and GIS: a case example applied to identifying difficult to evacuate neighborhoods," *Regional Science Association Annual Meeting*, November, Buffalo.

- 1997 Cova, T.J. and Church, R.L., "An algorithm for identifying nodal clusters in a transportation network," *University Consortium for Geographic Information Science (UCGIS) Summer Retreat*, Bar Harbor, June.
- 1996 Cova, T.J., Church, R.L., "A spatial search for difficult neighborhoods to evacuate using GIS," *GIS and Hazards Session, Association of American Geographers Annual Meeting*, Charlotte, April.
- 1995 Cova, T.J., Church, R.L., "A spatial search for neighborhoods that may be difficult to evacuate," *GIS/LIS '95*, Nashville, November.
- 1995 Goodchild, M.F., Cova, T.J. and Ehlschlaeger, C., "Mean geographic objects: extending the concept of central tendency to complex spatial objects in GIS," *GIS/LIS '95*, Nashville, November.
- 1994 Cova, T.J. and Goodchild, M.F., "Spatially distributed navigable databases for intelligent vehicle highway systems," *GIS/LIS '94*, Phoenix, November.

Grants

Externally funded

- 2018 – Smith, K. (PI), Cova, T.J., Waitzman, N., Perlich, P., Kowaleski-Jones, L. Research Data Center: Wasatch Front Research Data Center. National Science Foundation, Division of Social Economic Sciences, \$298,625.
- 2017 – 2019 Shoaf, K. (PI) and Cova, T.J. *RAPID: Evacuation Decision-making process of Hospital Administrators in Hurricane Harvey*. National Science Foundation, Civil Mechanical and Manufacturing Innovation – Infrastructure Management and Extreme Events, \$49,301.
- 2011 – 2015 Cova, T.J. (PI), Dennison, P.E. and Drews, F.A., *Protective action triggers*. National Science Foundation, Civil Mechanical and Manufacturing Innovation – Infrastructure Management and Extreme Events, \$419,784.
- 2012 – 2014 Cova, T.J. (PI), *State Hazard Mitigation Mapping II*. Utah Division of Emergency Management, \$51,608.
- 2011 – 2012 Cova, T.J. (PI), *State Hazard Mitigation Mapping*. Utah Division of Emergency Management, \$51,608.

- 2007 – 2010 Cova, T.J. (PI) and Drews, F.A. *Protective-action decision making in wildfires*. National Science Foundation, Civil Mechanical and Manufacturing Innovation – Infrastructure Management and Extreme Events, \$288,438.
- 2004– 2006 Yuan, M. (PI), Goodchild, M.F., and Cova, T.J. *Integration of geographic complexity and dynamics into geographic information systems*, National Science Foundation, Social and Behavioral Science—Geography and Spatial Sci., \$250,000.
- 2003– 2004 Cova, T.J. (PI) *Mapping the 2003 Southern California Wildfire Evacuations*, National Science Foundation, Small Grants for Exploratory Research (SGER), CMMI-IMEE, \$14,950.
- 2003 –2008 Dearing, M.D. (PI), Adler, F.R., Cova, T.J., and St. Joer, S. *The effect of anthropogenic disturbance on the dynamics of Sin Nombre*, National Science Foundation and NIH, Ecology of Infectious Diseases, \$1,933,943.
- 2000–2004 Hepner, G.F. (PI), Miller, H.J., Forster, R.R., and Cova, T.J. *National Consortium for Remote Sensing in Transportation: Hazards (NCRST-H)*, U.S. Department of Transportation, \$437,659.
- 2000–2001 Cova, T.J. (PI) *Modeling human vulnerability to environmental hazards*, Salt Lake City and Federal Emergency Management Agency (FEMA), \$20,000.

Internally funded

- 2004 Cova, T.J. (PI) and Sobek, A. *DIGIT Lab GPS Support*, U. of Utah Technology Instrumentation Grant, \$15,000.
- 2003 Cova, T.J. (PI) *New methods for wildfire evacuation analysis*, Proposal Initiative Grant, College of Social and Behavioral Science, University of Utah, \$4000.
- 1999 Cova, T.J. (PI) *Microscopic traffic simulation of regional evacuations: computational experiments in a controlled environment*, Faculty Research Grant (FRG), University Research Committee, University of Utah, \$5980.
- 1999 Cova, T.J. (PI) *Regional evacuation analysis in fire prone areas with limited egress*, Proposal Initiative Grant, College of Social and Behavioral Science, University of Utah, \$4000.

Media Outreach

- 2019 Krieger, L., "Camp Fire: when survival means shelter." *San Jose Mercury News*, Feb. 3.
- 2018 Romero, S., Arango, T., and Fuller, T. "A frantic call, a neighbor's knock, but few official alerts as wildfire closed in." *New York Times*, Nov. 21.
- 2018 Serna, J., St. John, P., Lin, R-G. "Disaster after disaster, California keeps falling short on evacuating people from harm's way." *Los Angeles Times*, Nov. 28.
- 2018 Simon, M. "How California needs to adapt to survive future fires." *Wired Magazine*, Nov. 15.
- 2018 O'Neill, S. "Year-round wildfire season means always living evacuation ready." Morning Addition, *National Public Radio*, Sep. 25.
- 2017 Mortensen, M. "System used for Amber Alerts can also warn of other emergencies." Utah Public Radio, Dec. 19.
- 2013 Ryman, A. and Hotstege, S. "Yarnell evacuation flawed and chaotic, experts say." *Arizona Republic and USA Today*, Nov.
- 2013 Bryson, D., and Campoy, A. "Quick fire response pays off: Colorado credits early alerts with limiting deaths from state's worst-ever blaze." *The Wall Street Journal*, June 17.
- 2013 Beri, A. "Due to the sequester: people are going to be unsafe, homes are going to burn." *Tampa Bay Times*, Feb.
- 2012 Zaffos, J. "What the High Park Fire can teach us about protecting homes." *High Country News*, July.
- 2012 Meyer, J.P. and Olinger, D., "Tapes show Waldo Canyon fire evacuations delayed two hours." *The Denver Post*. July.
- 2011 Siegel L, and Rogers, N. "Monitoring killer mice from space." *USA Today, SLTribune, Fox 13 News, KCPW*, Feb. 15.
- 2010 Cowan, J., "Esplin defends stay or go policy." *Australian Broadcast Corporation (ABC)*, April 30.
- 2010 Bachelard, M., "Should the fire-threatened stay or go? That is still the question." *The Age, Australia*, May 2.
- 2008 Boxall, B., "A Santa Barbara area canyon's residents are among many Californian's living in harm's way in fire-prone areas." *Los Angeles Times*, July 31.
- 2007 Welch, W.M. et al., "Staggering numbers flee among fear and uncertainty." *USA Today*, Oct. 24.
- 2007 Krasny, M., "Angora Wildfire Panel Discussion." *KQED Radio*, San Francisco, June 27.
- 2004 Wimmer, N., "Growing number of communities pose fire hazard." *KSL Channel 5, Salt Lake City*, July 22.
- 2004 Disaster News Network, "The face of evacuation procedures might be changing as a result of lessons learned from last year's fierce wildfires in California."
- 2004 Perkins, S., "Night space images show development." *Science News*, Week of April 3rd, 165 (14): 222.
- 2003 Keahey, J., "Canyon fire trap feared." *SL Tribune*, June.

TEACHING AND MENTORING

Undergraduate Courses

Geoprogramming (~30 students)
Introduction to Geographic Information Systems (~60 students).
Human Geography (~40 students).
Geography of Disasters and Emergency Management (~20 students).
Methods in GIS (~40 students).

Graduate Courses

GIS & Python (~20 students)
Spatial Databases (~30 students)
Seminars: Hazards Geography, Transportation, Vulnerability, GIScience.

Graduate Student Advising

Chaired Ph.D. Committees

2017-	Coleman, A.	Geographic data fusion for disaster management
2016	Li, D.	Modeling wildfire evacuation triggers as a coupled natural-human system (Asst. Professor South Dakota State University)
2010	Siebeneck, L.	Examining the geographic dimensions of risk perception, communication and response during the evacuation and return-entry process. (Assoc. Professor, U. of North Texas)
2010	Cao, L.	Anthropogenic habitat disturbance and the dynamics of hantavirus using remote sensing, GIS, and a spatially explicit agent-based model. (Postdoc, Kelly Lab, UC Berkeley)

Chaired M.S. committees

2018-	Huang, Z.	Autonomous vehicles in disasters.
2017-	Kar, A.	Optimal vehicle routing in disasters
2017	Yi, Y.	A web-GIS application for house loss notification in wildfires
2017	Latham, P.	Evaluating the effects of snowstorm frequency and depth on skier behavior in Big Cottonwood Canyon, Utah
2016	Bishop, S.	Spatial access and local demand for emergency medical services in Utah
2015	Hile, R.	Exploratory testing of an artificial network classification for enhancement of a social vulnerability index

2015	Unger, C.	Creating spatial data infrastructure to facilitate the collection and dissemination of geospatial data to aid in disaster management
2014	Klein, K.	Tracking a wildfire in areas of high relief using volunteered geographic information: a viewshed application
2012	Amussen, F.	Greek island social networks and the maritime shipping dominance they created (technical report)
2012	Martineau, E.	Earthquake risk perception in Salt Lake City, Utah
2010	Smith, K.	Developing emergency preparedness indices for local government
2010	VanDrimmelen, M.	Family gathering in emergencies: the 2007 Angora Wildfire as a case study
2007	Pultar, E.	GISED: a dynamic GIS based on space-time points
2007	Siebeneck, L.	An assessment of the return-entry process for Hurricane Rita, 2005
2007	Johnson, J.	Microsimulation of neighborhood-scale evacuations
2004	Chang, W.	An activity-based approach to modeling wildfire evacuations

Membership on Ph.D Committees

2017	Campbell, M.	Wildland firefighter travel times
2016	Zhang, L.	Economic geography of China
2015	Huang, H.	Spatial analysis and economic geography
2014	Lao, H.	Spatial analysis, GIS, and economic geography
2013	Burgess, A.	Hydrologic implications of dust in snow in the Upper Colorado River Basin
2012	Davis, J.	
2012	Li, Y.	
2011	Hadley, H.	Transit sources of salinity loading in the San Rafael River, Upper Colorado River Basin, Utah
2009	Medina, R.	Use of complexity theory to understand the geographical dynamics of terrorist networks
2008	McNeally, P.	Holistic geographical visualization of spatial data with applications in avalanche forecasting
2008	Sobek, A.	Generating synthetic space-time paths using a cloning algorithm on activity behavior data
2007	Clay, C.	Biology
2006	Backus, V.	Assessing connectivity among grizzly bear populations near the U.S.-Canada border
2006	Atwood, G.	Shoreline superelevation: evidence of coastal processes of Great Salt Lake, Utah

2006	White, D.	Chronic technological hazard: the case of agricultural pesticides in the Imperial Valley, California
2005	Ahmed, N.	Time-space transformations of geographic space to explore, analyze and communicate transportation systems
2004	Shoukrey, N.	Using remote sensing and GIS for monitoring settlement growth expansion in the eastern part of the Nile Delta Governorates in Egypt (1975-1998)
2004	Hernandez, M.	A Procedural Model for Developing a GIS-Based Multiple Natural Hazard Assessment: Case Study-Southern Davis County, Utah
2003	Wu, Y-H.	Dynamic models of space-time accessibility
2003	Hung, M.	Using the V-I-S model to analyze urban environments from TM imagery
2002	Baumgrass, L.	Initiation of snowmelt on the North Slope of Alaska as observed with spaceborne passive microwave data

Membership on M.S. Committees

2015	Farnham, D.	Food security and drought in Ghana
2015	Fu, L.	Analyzing route choice of bicyclists in Salt Lake City
2014	Li, X.	Spatial representation in the social interaction potential metric: an analysis of scale and parameter sensitivity
2013	Johnson, D.	Parks, Recreation & Tourism
2012	Fryer, G.	Wildland firefighter entrapment avoidance: developing evacuation trigger points utilizing the WUIVAC fire spread model.
2011	Groeneveld, J.	An agent-based model of bicyclists accessing light-rail in Salt Lake City
2011	Matheson, D.S.	Evaluating the effects of spatial resolution on hyperspectral fire detection and temperature retrieval
2010	Larsen, J.	Analysis of wildfire evacuation trigger-buffer modeling from the 2003 Cedar Fire, California.
2010	Smith, G.	Development of a flash flood potential index using physiographic data sets within a geographic information system
2010	Song, Y.	Visual exploration of a large traffic database using traffic cubes
2010	Evans, J.	Parks, Recreation & Tourism
2008	Naisbitt, W.	Avalanche frequency and magnitude: using power-law exponents to investigate snow-

avalanche size proportions through time and space.

2008 Kim, H.C. Civil Engineering

2007 Gilman, T. Evaluating transportation alternatives using a time geographic accessibility measure

2004 Baurah, A. An integration of active microwave remote sensing and a snowmelt runoff model for stream flow prediction in the Kuparak Watershed, Arctic Alaska

2004 Bosler, J. A Development Response to Santaquin City's Natural Disasters.

2004 Bridwell, S. Space-time masking techniques for privacy protection in location-based services

2004 Deeb, E. Monitoring Snowpack Evolution Using Interferometric Synthetic Aperture Radar (InSAR) on the North Slope of Alaska, USA

2004 Sobek, A. Access-U: a web-based navigation tool for disabled students at the University of Utah

2003 Barney, C. Locating hierarchical urban service centers along the Wasatch Front using GIS location-allocation algorithms

2002 Koenig, L. Evaluation of passive microwave snow water equivalent algorithms in the depth hoar dominated snowpack of the Kuparuk River Watershed, Alaska, USA

2002 Larsen, C. Family & Consumer Studies

2002 Krokoski, J. Geology & Geophysics

2000 Granberg, B. Automated routing and permitting system for Utah Department of Transportation

2000 Bohn, A. An integrated analysis of the Tijuana River Watershed: application of the BASINS model to an under-monitored binational watershed

Graduate student awards

2015 R. Hile., M.A. Geography: Jeanne X. Kasperson Award, Hazards, Risk & Disasters Specialty Group, Association of American Geographers.

2015 D. Li, Ph.D. Geography: Jeanne X. Kasperson Award, Hazards, Risk & Disasters Specialty Group, Association of American Geographers.

2012 K. Klein, M.A. Geography: *Jeanne X. Kasperson Award*, Hazards, Risk & Disasters Specialty Group, Association of American Geographers.

2010 L. Cao, Ph.D. Geography: *Student Paper Award*, Spatial Analysis and Modeling (SAM) Specialty Group, Association of American Geographers.

- 2008 L. Siebeneck, M.A. Geography: *Jeanne X. Kasperson Award*, Hazards Specialty Group, Association of American Geographers.
- 2007 E. Pultar, M.A. Geography: *Best Paper*, GIS Specialty Group, Association of American Geographers.
- 2006 J. VanLooy (not primary advisor): *Best Paper*, Rocky Mountain Regional Meeting, Association of American Geographers.

Undergraduate Mentoring and Advising

- 2015 Mentor, Marli Stevens, Undergraduate Research Opportunity Program: "Margin of Licensed Dog and Cat Populations and Adoptions from Animal Shelters in Utah in 2013-2014."
- 2015— Advisor, Undergraduate Hazards & Emergency Management Certificate students (~10 students so far).
- 2006—2010 Advisor, Stewart Moffat, Honor's B.S. in Undergraduate Studies: Disaster Management (published journal article).
- 2005—2007 Advisor, Brian Williams, B.S. in Undergraduate Studies: Comprehensive Emergency Management.
- 2001— Advisor, Undergraduate GIS Certificate Students (> 100 students).

Junior Faculty Mentoring

- 2017— Andrew Linke, Department of Geography, University of Utah
- 2014—2017 Ran Wei, Department of Geography, University of Utah
- 2011—2014 Steven Farber, Department of Geography, University of Utah
- 2009—2011 Scott Miles, Dept. of Geography, Western Washington U.
- 2009—2011 Timothy W. Collins, Department of Sociology, UT El Paso

SERVICE

Referee Duties

Journals

Applied Geography
 Annals of the Association of American Geographers
 Cartographica
 Computers Environment & Urban Systems
 Disasters
 Environmental Hazards: Policy and Practice
 Geographical Analysis
 Geoinformatica

International Journal of Geographical Information Science
Journal of Geographical Systems
Journal of Transport Geography
Natural Hazards
Natural Hazards Review
Networks and Spatial Economics
Photogrammetric Engineering and Remote Sensing
Professional Geographer
Society & Natural Resources
Transportation Research A: Policy & Practice
Transportation Research B: Methodological
Transportation Research C: Emerging Technologies
Transactions in GIS

National Science Foundation Panels

Decision Risk and Uncertainty (1)
Geography and Spatial Science, Doctoral Dissertation Improvement Grant (4)
Civil & Mech. Systems – Infrastructure Management and Extreme Events (2)
Civil & Mech. Systems - Rural Resiliency (1)
NSF and NIH: Big Data (1)
Hazards SEES: Type 2 (1)

Proposals

Center for Disaster Management & Humanitarian Assistance
Faculty Research Grants, University of Utah (3)

External Promotional Reviews

Full Professor (5), Associate Professor (12)

Activities at Professional Conferences

2000 – 2018 **Paper session co-organizer, chair**, “Hazards, GIS and Remote Sensing” session, Annual Meeting of the Association of American Geographers.
2002 – 2003 **Paper session organizer, chair, and judge**, “GIS Specialty Group Student Paper Competition,” Association of American Geographers Annual Meeting.
1999 **Paper session organizer**, “Location Modeling and GIS,” Annual Meeting of the Association of American Geographers, Honolulu, Hawaii, March.

University Service

2014 – 2017 Member, Academic Senate
2014 – 2017 Member, University Promotion & Tenure Advisory Committee (UPTAC)
2011 – Member, Social Science General Education Committee
1999 – 2009 Delegate, University Consortium for GIScience

2013 Member, Graduate Research Fellowship (GRF) Committee
 2010 – 2012 Member Student Evaluations Committee, Undergrad. Studies
 2009 – 2012 Member, Graduate Council, College of Soc. and Beh. Science
 2003 – 2004 Member, Instit. Review Board (IRB) Protocol Committee
 2001 – 2004 Member, Social Science General Education Committee

College Service: Social & Behavioral Science

2014 – Chair, Review, Promotion & Tenure Committee
 2012 – 2014 Member, College Review, Promotion, & Tenure Committee
 2015 Member, Superior Teaching Committee
 2011 – 2012 Chair, Superior Teaching Committee
 2007 Member, Search Committee, Inst. of Public and Intern Affairs
 2005, 2006 Member, Superior Research Committee
 2002, 2004 Member, Superior Teaching Committee

Departmental Service: Geography

2015 – Member, Undergraduate Committee
 2014 –2017 Representative, University Academic Senate
 2014 – Director, Certificate in Hazards & Emergency Management
 2014 Author, Proposal for Cert. in Hazards & Emergency Manage.
 2012 – Chair, Review, Promotion & Tenure Committee
 2013 Chair, Search Committee for GIScience Position
 2012 Co-author, Proposal for MS in GIScience
 2011 – 2012 Director of Graduate Studies
 2010 Search Committee Chair, Human Geography Position
 2004 – 2015 Member, Graduate Admissions Committee
 2004 – 2008 Member, Colloquium Committee
 2000 – Chair, Geographic Information Science Area Committee