**STUDYING SOCIAL NETWORKS: THEORY, METHODS, AND ANALYSIS**

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This course is intended as a survey of the study of social networks. Class time will be devoted to learning principles, theoretical perspectives, and appropriate software packages for analyzing social network data. The readings are a combination of introductory-level material, classic, scholarly readings in the field, and empirical studies that apply social network analytic techniques to topics relevant to Geographical Sciences and the social sciences as a whole. The first weeks are structured around readings, group discussion, and lab. You will be given assignments that focus on theory, data collection, and then analysis. The last few weeks are geared more towards students’ individual projects on a topic of your choosing, and a final paper/project. *You are strongly encouraged, in the final project especially, to link course material with your own area of interest (e.g. GIS or your own discipline, if not Geographical Sciences, and so on). Social network analysis is used across a range of disciplines, and I’m interested in seeing how you make use of this toolkit in whatever area you consider to be your ‘intellectual home-base.’*

We will be drawing from the following texts. Serious students of network analysis are highly encouraged to purchase all of them. The first is ‘required’ and students must buy it. The last are ‘highly recommended’. These should be ‘reference texts’ you use for developing your projects.

* Prell (2012) *Social network analysis: history, theory, and methodology*. SAGE Publications.
* Wasserman and Faust. (1994) Social Network analysis: methods and applications. Cambridge University Press.
* Analyzing social networks (2013). Borgatti, Everett, and Johnson. SAGE
* Exponential random graph models for social networks (2012). Lusher, Koskinen, and Robins. Cambridge University Press.

**ASSIGNMENTS (See calendar for due dates):**

**Attendance and Participation: (15%)**

Consisting of weekly readings, homework, classroom attendance, and participation in classroom discussion.   
**Data gathering Exercise (2). (30% total)**  
Interviewing to gather ego network data, and written report. (15%)  
Administering a questionnaire to gather complete network data, and written report. (15%)  
**Data analysis assignments. (30% total)**

Using basic network measures to describe your network (written report). (15%)  
Modeling a network using ERGMs or SAOMs (written report). (15%)

**Final Project: Proposal (25%)**

Proposal should integrate a substantial amount of **course readings** in addition to readings uncovered on your own. Research questions/hypotheses should derive from a theoretical framework. Methods for gathering and analyzing the network data should be outlined. Expected outcomes should be outlined. Make explicit the Intellectual Merit and the Broader Impacts of your proposed study.

**COURSE CALENDAR**

**Week 1;** Introduction to the course and Measuring Social Networks

Required readings:

* Prell, network analysis. Chapter 1 and 3 (Chapter 2, History Chapter is optional)
* Borgatti, S. P., A. Mehra, D. J. Brass and G. Labianca. 2009. “Network Analysis in the Social Sciences.” Science 323:892-95.

*Lab time:* discussing details of ‘measuring’ and ‘gathering data’ project

**Week 2: Issues in Measuring and Gathering Data on Networks**

Required readings:

* Bellotti, E. (2008). What are friends for? Elective communities of single people. Social Networks, Volume 30, Issue 4, October 2008, Pages 318-329
* Fischer, Claude S. 1982. ‘What do we mean by ‘friend’? An inductive study’, *Social Networks,* 3, 287 – 306.
* Marsden, P.V. 2005. “Recent Developments in Network Measurement.” Pp. 8-30 in Carrington, P.J., Scott, J. and S. Wasserman (Eds.), Models and Methods in Social Network Analysis. Cambridge: Cambridge University Press.
* Fischer, C. S. (2009). The 2004 GSS Finding of Shrunken Social Networks: An Artifact? *American sociological review, 74*(4), 657-669.
* Feld, S. L. 1991. "Why Your Friends have More Friends than you do." American Journal of Sociology 96:1464-1477.

*Lab time:* discussing details of ‘measuring’ and ‘gathering data’ project. Data exploration in R. Drawing graphs/digraphs in UCINET and/or GEPHI.

**Week 3: Centrality and Positions – Power (Data Gathering Assignment 1 Due!)**

* Prell, Chapter 4
* Freeman, L.C. 1978/79. "Centrality in Social Networks: Conceptual Clarification." Social Networks 1:215-39.
* Borgatti, S.P. 2005. "Centrality and Network Flow." *Social Networks* 27:55-71.

Applications to Environmental Change, and/or Research on Coupled Systems:

* Hauck, J., J. Schmidt, and A. Werner. 2016. Using social network analysis to identify key stakeholders in agricultural biodiversity governance and related land-use decisions at regional and local level. *Ecology and Society* 21(2):49.  
  <http://dx.doi.org/10.5751/ES-08596-210249>
* Prell, Christina1, Klaus Hubacek, Mark Reed (2009). “Stakeholder analysis and social network analysis in natural resource management”, Society and Natural Resources, 22(6): 501-518.

*Lab time:*  Analysis of centrality measures. Displaying centrality visually in graphs/digraphs.

**Week 4: Network exchange and social exchange**

* Cook, Karen S., and Joseph M. Whitmeyer. 1992. “Two Approaches to Social Structure: Exchange Theory and Network Analysis.” *Annual Review of Sociology*, 18, 109-127.
* Molm, L. D., Collett, J. L., & Schaefer, D. R. (2007). Building solidarity through generalized exchange: A theory of reciprocity. *American Journal of Sociology, 113,* 205-242.
* Schaefer, D. R. (2011). Resource characteristics in social exchange networks: Implications for positional advantage. *Social Networks, 33*(2), 143-151.

Applications to Environmental Change, and/or Research on Coupled Systems:

* Downey, S. S. 2010. Can properties of labor-exchange networks explain the resilience of swidden agriculture? *Ecology and Society* **15**(4): 15.
* Violon, C., M. Thomas, and E. Garine. 2016. Good year, bad year: changing strategies, changing networks? A two-year study on seed acquisition in northern Cameroon. *Ecology and Society* 21(2):34.

*Lab time:*  TBA

**Week 5: Open versus Closed (Data Gathering Assignment 2 Due!)**

* Flap, Henk, and Beate Völker. 2001. "Goal specific social capital and job satisfaction: Effects of different types of networks on instrumental and social aspects of work." Social Networks 23(4):297-320.
* Uzzi, B. 1996. The Sources and Consequences of Embeddedness for the Economic Performance of Organisations: The Network Effect. *American sociological review* 61: 674-698.
* Burt, R. . 2001. "Structure Holes versus Network Closure as Social Capital." Pp. 31-56 in Social Capital: Theory and Research, edited by K. Cook N. Lin, and R. Burt (eds.) New York: Aldine de Gruyter. Access it here: <http://faculty.chicagobooth.edu/ronald.burt/research/files/SHNC.pdf>
* Granovetter, M. 1973. "The strength of weak ties." *American Journal of Sociology* 78:1360-80.

Applications to Environmental Change, and/or Research on Coupled Systems:

Barnes-Mauthe, M., et al. (2015). What Determines Social Capital in a Social–Ecological System? Insights from a Network Perspective, Environmental Management 55:392–410

Labtime: analyses of structural holes, cliques, cohesive subgroups, etc.

**Week 6: Positional and Role Analysis**

* Prell’s textbook, Chapter XX on block modelling and positional analysis
* Borgatti, S.P. and M.G. Everett. 1992. “Notions of Position in Social Network Analysis.” *Sociological Methodology*, 22:1-35.
* Borgatti, S.P. and M.G. Everett. 1999. “Models of Core/Periphery Structures.” *Social Networks* 21:375-395

Applications to Environmental Change, and/or Research on Coupled Systems:

* A.P. Fischer, K. Vance-Borland, K.M. Burnett, S.S. Hummel, J. Creighton, L. Jasny, S. Johnson (2014). “Does the social capital in networks of ‘fish and fire’ scientists and managers suggest learning?” Society and Natural Resources 27(7)
* Prell, C., Feng, K., Sun, L., Geores, M., & Hubacek, K. (2014). The economic gains and environmental losses of US consumption: a world-systems and input-output approach. *Social Forces, 93*(1), 405-428.

*Lab time*: positional analysis/block modelling in R and/or UCINET.

**Week 7: Network Level Measures**

* Prell’s textbook, Chapter XX on Network Level
* Watts, D. J. (1999). Networks, dynamics, and the small-world phenomenon. American Journal of Sociology, 105(2), 493– 527. doi:10.1086/210318
* Prell, Christina1, Yi-Jung Lo (2016). “Network formation and knowledge gains”. The Journal of Mathematical Sociology, 40:1, 21-52, DOI: 10.1080/0022250X.2015.1112385

Applications to Environmental Change, and/or Research on Coupled Systems:

* J. M. Fliervoet , et al., Analyzing Co(2016). Collaborative Governance Through Social Network Analysis: A Case Study of River Management Along the Waal River in The Netherlands. Environmental Management, 57:355–367
* (density and centrality) Díaz-Reviriego, I., et al. (2017). "Fishing in the Amazonian Forest: A Gendered Social Network Puzzle." Society & Natural Resources **30**(6): 690-706.
* (density and exchange networks): Mandarano, L. A. (2009). "Social Network Analysis of Social Capital in Collaborative Planning." Society & Natural Resources **22**(3): 245-260.

*Lab time*: Computing density, centralization, small worlds measures.

**Week 8: Modeling networks**

**Data Analysis Assignment 1 Due!**

* Robins, G., P. Pattison, Y. Kalish and D. Lusher. 2007. An Introduction to Exponential Random Graph (*p*\*) Models for Social Networks. *Social Networks,* 29:173-191.
* Robins, G., Pattison, P., & Woolcock, J. (2005). Small and other worlds: Global network structures from local processes. American Journal of Sociology, 110(4), 894–936.

Applications to Environmental Change, and/or Research on Coupled Systems:

* Fischer, A. P., and L. Jasny. 2017. Capacity to adapt to environmental change: evidence from a network of organizations concerned with increasing wildfire risk. Ecology and Society 22(1):23.
* Thomas, M., and S. Caillon. 2016. Effects of farmer social status and plant biocultural value on seed circulation networks in Vanuatu. Ecology and Society 21(2):13.
* (multilevel and ERGM) Bodin, Ö., G. Robins, R. R. J. McAllister, A. Guerrero, B. Crona, M. Tengö, and M. Lubell. 2016. Theorizing benefits and constraints in collaborative environmental governance: a transdisciplinary social-ecological network approach for empirical investigations. *Ecology and Society* 21(1):40.

Lab time: Ergms in R and/or PNet

**Week 9: Homophily, social influence, and RSiena**

* Snijders, T. A. B., G. G. van de Bunt, and C. E. G. Steglich. 2010. “Introduction to Stochastic Actor-Based Models for Network Dynamics.” Social Networks 32:44-60.
* Steglich, C., T. A. B. Snijders and M. Pearson. 2010. “Dynamic Networks and Behavior: Separating Selection from Influence.” Sociological Methodology 40:329-93.

Applications to Environmental Change, and/or Research on Coupled Systems:

* Matous, P., and Y. Todo. 2015. Exploring dynamic mechanisms of learning networks for resource conservation. *Ecology and Society* **20**(2): 36.
* Prell, Christina1 , Sun, L., Feng, K., He, J., Hubacek, K. (2017). “Uncovering the spatially distant feedback loops of global trade: A network and input-output approach.” Science of the Total Environment (586): 401-408.
* Prell, Christina1, Feng, K. (2016). “The evolution of global trade and impacts on countries’ carbon trade imbalances”. Social Networks (46): 87-100.

Lab time: RSiena

**Week 10: Spatial networks and social networks**

* Daraganova, G., et al. (2012). "Networks and geography: Modelling community network structures as the outcome of both spatial and network processes." Social Networks 34(1): 6-17.
* Doreian, P. and N. Conti (2012). "Social context, spatial structure and social network structure." Social Networks 34(1): 32-46.
* Sailer, K. and I. McCulloh (2012). "Social networks and spatial configuration—How office layouts drive social interaction." Social Networks 34(1): 47-58.
* Schaefer, D. R. (2012). "Youth co-offending networks: An investigation of social and spatial effects." Social Networks 34(1): 141-149.

Lab time: TBD

**Week 11: Catch up and review – Additional Tools**

* Second Data Analysis Project Due today.
* ORA workshop???

**Week 12-14:** Developing your Final Proposals, Student Presentations.

**Week 15:** Projects due