

LAND USE ECONOMICS AND SPATIAL MODELING

AREC 647

Fall 2018

Instructor: Jordan Suter

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Office Hours (Clark B-314): Wed. 2–3 and by appointment

Description:

This course will focus on the utilization of spatial data in economic analysis, with an emphasis on evaluating how policy and human behavior determine land use outcomes. Special attention will be given to statistical analysis of data that describes and appropriately accounts for spatial relationships between observations. The course content will address how researchers analyze the location decisions of firms and households and how these decisions cumulatively determine the extent of land development. In addition to reviewing the classical literature in land economics, we will cover applied research topics related to land conservation, public lands management, and land use implications of wildfire, invasive species, and water resources.

Course Objectives:

- (1) Learn how to incorporate variables calculated using geographic information systems data into economic analyses.
 - (2) Develop an understanding of how to utilize spatial variation in causal identification strategies and how to appropriately account for spatial correlations in the representation and statistical analysis of spatial data.
 - (3) Gain exposure to seminal research in land economics as well as emerging research in the areas of wildfire economics, invasive species, and conservation planning and policy.
 - (4) Apply research and presentation skills through incorporating spatial modeling into an economic research poster.
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Readings:

The readings will come primarily from journal articles that will be made available through the Canvas system. The readings that are required for a given section of the course are indicated in the schedule below and readings for specific class sessions will be announced in class. All documents, including problem sets and exams, will be posted on the Canvas site for this class.

Grading (out of 100%):

Homework assignments (25%) – You will be given one week to complete each problem set. You are allowed to work on the assignments with one other student. If you choose to work with another student, please turn in one assignment with each of your names at the top. I expect each individual to fully understand all solutions provided.

Participation (5%) – I expect you to attend each class having completed the reading assigned for that day and prepared to contribute to the discussion. On some occasions I will ask you to prepare your thoughts on how you would expand or improve the analysis provided in the assigned reading.

Poster (20%) – Each student will conduct a research project that utilizes spatial data in an empirical analysis that addresses an economic research question. The poster should present the research question, background, and findings in a concise and visually appealing way.

Presentations (10%) – You will present your work on two occasions during the semester. The first occasion will involve presenting a hedonic modeling exercise that will be completed with a partner. The second presentation will be based on the independent work that you carry out for your poster.

Midterm exam (15%) – The midterm will be a take home exam that includes several short problems that will require both analytic and computational solutions.

Final exam (25%) – The comprehensive final exam will be administered during the exam period.

Final grades will be based out of 100 percent, weighted according to the values above. Letter grades will be assigned using the scale: A (100–90), B (89–80), C (79–70), D (69–60), F (59 and below).

Need Help?

CSU is a community that cares for you. If you are struggling with drugs or alcohol and/or experiencing depression, anxiety, overwhelming stress or thoughts of hurting yourself or others please know there is help available. Counseling Services has trained professionals who can help (970.491.6053, <http://health.colostate.edu>). If you are concerned about a friend or peer, tell someone by calling 970.491.1350 to discuss your concerns with a professional who can discreetly connect the distressed individual with the proper resources (<http://supportandsafety.colostate.edu/tellsomeone>).

Accommodations:

If you are a student who will need accommodations due to a disability or chronic health condition, please make an appointment with me to discuss your individual needs. Any accommodation must be discussed in a timely manner prior to implementation. A verifying accommodation letter from Resources for Disabled Students is required before any accommodation is provided. The Student Disability Center is available at <https://disabilitycenter.colostate.edu/> and is located in TILT, room 121 or reachable via phone at 970-491-6385.

Course Outline and Schedule:

- I. Foundations of land economics**
 - Seminal economic thinking related to bid-rent functions and land use outcomes from Ricardo, von Thunen, and Tiebout.
- II. Spatial data and measures**
 - Working with spatial data in ArcGIS and R, generating spatial measures.
- III. Spatial econometrics and empirical methods**
 - Parametric spatial lag and spatial error models, nonparametric measures.
- IV. Hedonic models and matching methods**
 - Hedonic models applied to residential and agricultural land and using matching methods to improve counterfactual analysis.
- V. Spatial discontinuity designs and land use change models**
 - Identifying causal impacts with spatial discontinuities, models of land use change.
- VI. Land conservation and implications for water resources**
 - Sprawl at the rural-urban fringe, transferable development rights, conservation easements, optimal site selection, land use impacts on water quantity and quality.
- VII. Public land management**
 - Managing land for multiple use, public land impacts on local economic outcomes.
- VIII. Wildfire and invasive species**
 - Research related to wildfire economics and invasive species management.

Schedule

Week	Assignment	Topic	Readings
21-Aug 28-Aug		Foundations of land economics	Angeleson 2010; Samuelson 1983; Medelsohn 1994; Severerin et al 2018; Tiebout 1956; Bahzhaf and Walsh 2008
4-Sep 11-Sep	PS1	Managing spatial data and spatial spillovers	Dell 2009; Overman 2010; Peterson et al. 2014
18-Sep 25-Sep 2-Oct	PS2	Spatial econometrics Hedonic modeling Matching methods	Anselin 2002; LeSage and Pace 2008; Tsusaka et al. 2015 Freeman 2001; Anderson and West 2006; Walls et al. 2015; Meldrum 2016 Arriagada et al. 2012; Costedoat et al. 2015; Claasen et al. 2015
9-Oct 16-Oct	PS3/Pres. 1	Spatial discontinuity Land use change	Cuaresma et al. 2017; Hornbeck and Keskin 2015 Lawler et al. 2017; Newbern and Berck 2006
23-Oct 30-Oct	Midterm	Land conservation Optimization	Ferris and Lynch 2014; McConnell et al. 2006; Lewis and Plantinga 2007 Polasky et al. 2008; Williams et al. 2004; Watanabe et al. 2008
6-Nov	PS4	Land and water linkages	Bigelow 2017; Xu et al. 2018; Wrenn and Klaiber 2017
13-Nov 20-Nov	PS5	Public land management Thanksgiving	Ferraro et al. 2011; Rasker et al. 2013; Rosenberger et al. 2017
27-Nov 4-Dec	Poster Pres. 2	Wildfire and invasive species	Montgomery 2014; Konoshima et al. 2008; Ephanchin-Niell and Wilen 2014