Spatiotemporal Dynamics of Urban Growth in the Coeur d'Alene Metropolitan Area, Idaho

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Introduction

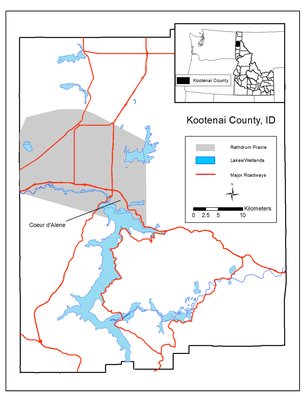
- Urbanization is the key driver of land use change worldwide.
- The American West has long been represented by low population density and large amounts of undeveloped land until the 1990s (Hansen et al. 2002). Recent migratory pattern have been the most often cited example of amenity-driven migration (Gosnell & Abrams 2011), resulting in new exurban growth and increased tension between people and the natural environment.
- Understanding urban growth patterns and trajectories assists in planning for sustainable growth (Dahal et al. 2016; Shariff et al. 2010).

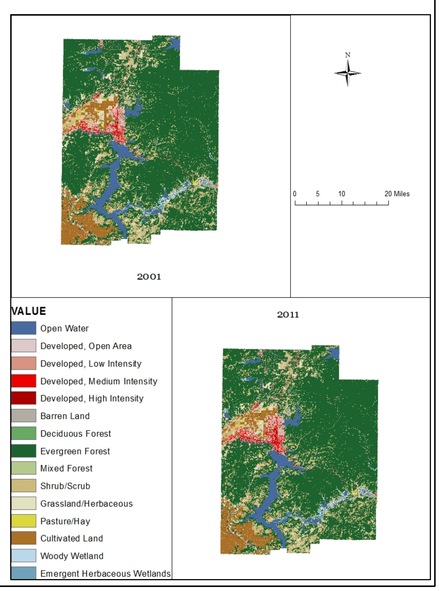
Research Questions

- How does applying spatially explicit methods such as **gradient analysis** help us understand the **direction, magnitudes and patterns** of urban land expansion?

Study Area and Data

- Situated in Northern Idaho, Coeur d'Alene is one of the major cities in Idaho; economic development driven by natural amenity.
- The surrounding area, called the Coeur d'Alene Metropolitan Statistical Area has a population of 138,494 as of the 2010.
- This study mainly draws upon the classified land cover data from 1992-2011 from NLCD, in conjunction with socioeconomic datasets gathered from local governments.





Methods

- Land-use conversion matrix and GIS mapping
- Gradient analysis of growth patterns
- Urban growth form analysis: Classifies the type of urban growth by calculating its shared perimeter with existing urban areas

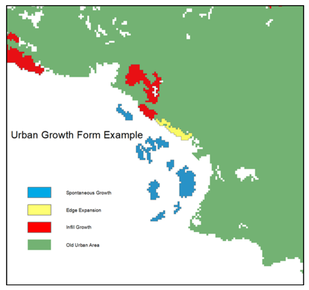
  S= Lc/P; Where Lc is the common length boundary between old & new urban patches

  P is total patch perimeter

  If S>=0.5, infill growth

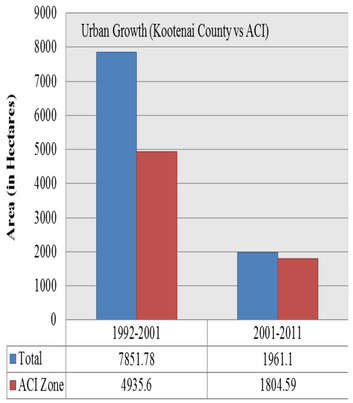
  If S>=0 but <0.5, edge expansion

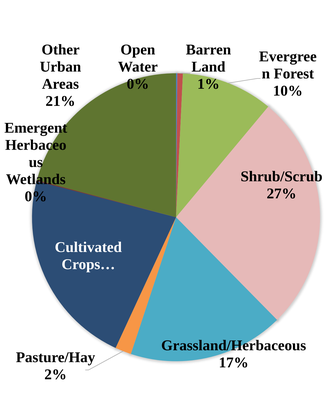
  If S==0, leapfrog growth

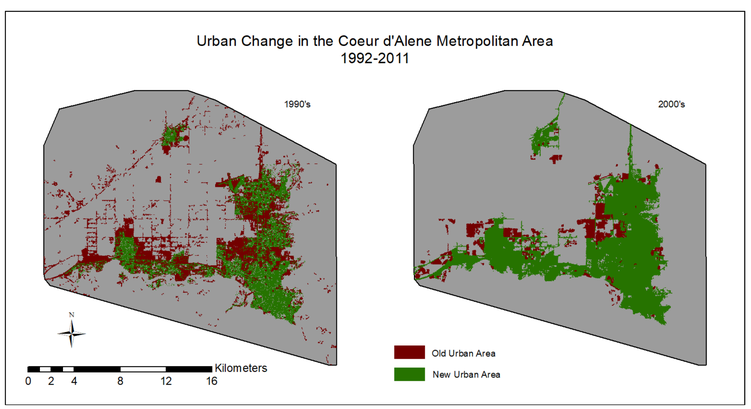


Results

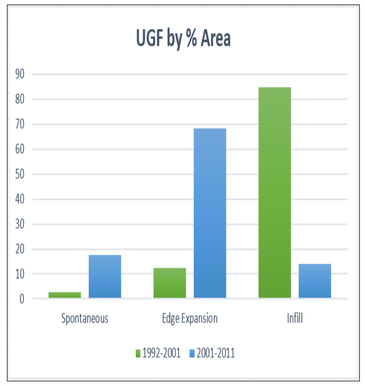
- Urban growth was more evident during the 1990s
- Concentrated in the area of city impact
- Shrub, grass and crop lands are major sources
- Major growth corridors located close to roads/rivers

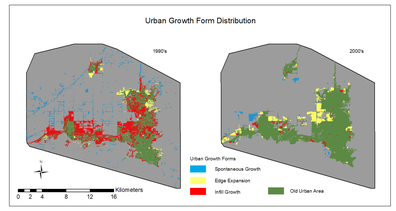


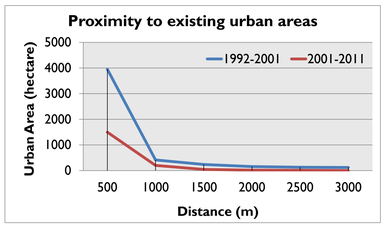


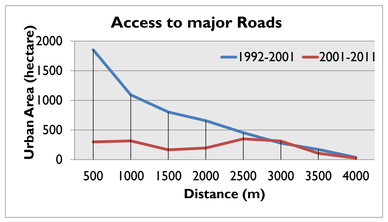


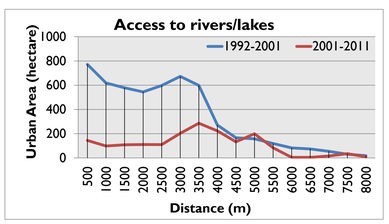
Results Cont'd











Growth forms:

- Infill growth dominated in the 1990s; Edge expansion was more evident in the 2000s
- Closer to the city center, more infill growth, followed by edge expansion and leapfrog type of urban growth

Gradient Analysis

- Intensity of urban growth is the highest near old urban areas and lower further away from existing urban areas
- Access to major roads shows a strong emphasis in the 1990s but less in the 2000s
- Similar emphasis on access to rivers and lakes during both periods of 1992-2001 and 2001-2011

Acknowledgements, Contact Info. & References

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Contact information: If any questions, please feel free to contact Andrew Layton (alayton@uidaho.edu) or Dr. Felix (Haifeng) Liao (hliao@uidaho.edu)

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