Abstract:

Background:
During the last 400 years, human knowledge and the concurrent use of power have developed exponentially. The fruits of this labor can be summed up as modern life and modern conveniences in the developed world. However, these conveniences have come at a cost. Human systems have grown so large that they are at risk of overwhelming the biological systems in which they are embedded. As scientific knowledge and understanding has increased, the realization that the earth is a complex system full of interactions and interrelationships among the biota, land, atmosphere, and oceans has developed along with the realization that human activities are intimately tied into these systems. Even though they play an ever-increasing role in earth systems, human activities are currently not coordinated with or integrated into earth systems in a coherent manner. This research intends to explore the interactions between industrial activities (including the built environment and manufacturing activities) and earth systems in order to devise decision-making and design methodologies that help create solutions which bring industrial activity into coherence with earth systems.

Case Study:
This case study describes the process including necessary requirements and major problems associated with constructing and operating a small parts manufacturing facility in the mid-lands of South Carolina using the concepts of industrial ecology. Major areas of discussion include:

- Facility Siting
- Facility Design
- Facility Construction
- Environmental Management System Implementation (ISO 14001)
  - Input output analysis using IE concepts
  - Identifying aspects and impacts using IE concepts
  - Setting and carrying out goals