

Seminar

Environmental Management Metrics for Sustainability: The San Luis Basin Project

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**Friday, March 13 at 12pm
SEO Room 236, 851 South Morgan Street**

Sustainability is about the likelihood of the world persisting in a dynamic regime that is supportive of human society. But without at least semi-quantitative means of measuring progress in a meaningful manner, it is difficult to implement a sustainability strategy in any practical sense. There is, therefore, a need for scientifically sound metrics to provide quantitative measures that assess the degree to which the system is or is not on a path towards sustainability, and whether management actions taken are or are not efficacious in maintaining the system on a sustainable path.

All sustainability questions involve a complex and interacting system that has many dimensions. These are normally the purview of separate traditional disciplines such as ecology, economics, and engineering. While we might never fully understand such a complex system, there is an immediate need for methods to analyze and manage the system. We have selected four metrics for use in environmental management: ecological footprint, energy, green net regional product, and Fisher information. These represent human burden on the environment, energy resources flow in the system, economic vitality, and overall system order and function. While the list of metrics is by no means exhaustive, they are never the less a reasonable starting set. These metrics are meant to represent system processes and qualities that must be preserved for sustainability in the context of a system that is evolutionary and cyclic. The trends in these metrics imply whether the system is moving over time toward or away from sustainability. As an example, an increasing ecological footprint signifies movement away from sustainability.

Using the San Luis Valley in Colorado as a test bed, we have collected data that allow us to compute these four metrics as a function of time, and to observe trends with time for these metrics. There are at this point metric calculations spanning approximately twenty years. These will be discussed in detail along with their implications for the sustainability of the San Luis Valley in Colorado. Lastly, the outline of a management strategy on a regional scale using these concepts and metrics will be discussed.



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