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Clive G. Jones, Terrestrial Ecologist

Summary:

Clive Jones has spent much of his career studying how organisms physically modify the non-living environment and the consequences for those species, other species, and ecological processes. This now well-established field of basic and applied science pioneered by Jones is called ecosystem engineering. Dam-building beavers, earthworms plowing soil, plants stabilizing sand dunes, and soil crusts made by microbes are a few of many examples of species engineering the environment.

Humans are ecosystem engineers *par excellence* – agriculture is just one example. Jones explores how knowledge of nature's ecosystem engineers can be used to help understand human environmental modification with the goal of reducing adverse collateral impacts, such as allowing rivers to meander to enhance flood control, rather than straightening them. Of particular interest to Jones is the growing use of nature's engineers to do the work of environmental modification. Examples include reintroducing beaver to regulate hydrology and create habitats for species; using coral reefs, oyster reefs, mangroves, and salt grass to increase coastal protection and improve water quality; and reintroducing native earthworms in agriculture to enhance soil drainage, aeration, and soil fertility.

The application of our basic understanding of nature's ecosystem engineers illustrates dual strategies of using natural processes and mimicking nature to enhance environmental sustainability. Helping develop ecosystem engineering into a practical arm of sustainability science has also been an emphasis of Jones' efforts. This has included helping build multidisciplinary networks of scientists, practitioners and decision makers oriented around application of ecosystem engineering, and incorporating ecosystem engineering into the training of environmental engineers and managers.

Jones has also contributed to understanding complex interaction webs in oak forests that connect oaks and acorns with insect outbreaks and Lyme disease. His earlier work in chemical ecology involved the development of theories on evolution of the diversity of chemical defenses, and empirical work on interactions among plants, herbivores, microbes, and environmental stress. He has also contributed to ecological synthesis, integration and theory.

Select publications:

Jones, C. G., J. H. Lawton, and M. Shachak. 1994. **Organisms as ecosystem engineers**. *Oikos* 69:373-386.

Jones, C. G., J. L. Gutiérrez, J. E. Byers, J. A. Crooks, et al. 2010. **A framework for understanding physical ecosystem engineering by organisms**. *Oikos* 119:1862-1869.

Jones, C. G., J. H. Lawton, and M. Shachak. 1997. **Positive and negative effects of organisms as physical ecosystem engineers**. *Ecology* 78: 1946-1957.

Byers, J. E., K. Cuddington, C. G. Jones, T. S. Talley, et al. 2006. **Using ecosystem engineers to restore ecological systems**. *Trends in Ecology and Evolution* 21: 493-500.

Gutiérrez, J. L., C. G. Jones, D. L. Strayer, and O. O. Iribarne. 2003. **Mollusks as ecosystem engineers: the role of shell production in aquatic habitats**. *Oikos* 101: 79-90

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