

# Resilience Defined

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The terms “adaptive capacity” and “resilience”, as used in the language of sustainability, are sometimes taken to be synonymous. For the purposes of its work the Resilience Alliance [www.resalliance.org](http://www.resalliance.org) considers resilience to be the overarching concept to which adaptive capacity contributes, and we define it as follows:

A resilient socio-ecological system is synonymous with a region that is ecologically, economically, and socially sustainable. The word "resilience" has been used in two different . One interpretation has to do with the rate of return of a system to some equilibrium state after a small disturbance. This is what we term "engineering resilience", and we are not concerned with it here.

The Alliance is concerned with the magnitude of disturbance that can be experienced before a system moves into a different state and different set of controls - "ecosystem resilience", as originally conceived by Holling (1973). Based on this interpretation, and in accordance with the above discussion, resilience is defined for use as follows:

"Resilience" as applied to ecosystems, or to integrated systems of people and natural resources, has three defining characteristics:

- The amount of change the system can undergo and still retain the same controls on function and structure (still be in the same state - within the same domain of attraction)
- The degree to which the system is capable of self-organization
- The ability to build and increase the capacity for learning and adaptation

Resilience is the potential of a particular configuration of a system to maintain its structure/function in the face of disturbance, and the ability of the system to re-organize following disturbance-driven change. Adaptive capacity is a component of this resilience that reflects a learning aspect of system behavior in response to disturbance.

Resilience, *per se*, is not necessarily a good thing. Undesirable system configurations (e.g. Stalin's regime, collapsed fish stocks) can be very resilient, and they can have high adaptive capacity in the sense of re-configuring to retain the same controls on function. Building resilience of a desired system configuration requires increasing the adaptive capacity of

structures and processes (social, ecological, economic) that help maintain this configuration. It also requires reducing the adaptive capacity of those that tend to undermine it. For example, right-to-know legislation reduces the adaptive capacity of firms to keep polluting by making their toxic releases public instead of secret. Developing adaptive capacity of a desirable configuration leads to increasing the resilience of this configuration.

Resilience in social systems is different in one very important respect from that in ecosystems – i.e. the ability (adaptive capacity) of humans to imagine the future, the capacity for forward planning. The extent and elaboration of human forward-looking or anticipatory behavior greatly exceeds anything found in the natural world.

The terms ‘resilience’ and ‘adaptive capacity’ have both metaphorical and specific (empirical) meanings. Both have value, and making either term operational requires reducing the broad, metaphorical definitions to a set of “variables of concern” – the resilience *of* what *to* what. Measuring resilience requires an empirical, context-dependent definition. In an operational sense we take managing for "sustainability" in socio-economic systems to mean learning how to maintain and enhance adaptive capacity, and understanding when and where it is possible to intervene in management to prevent undesirable trajectories.

## References

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