Sustaining Living Rivers

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Primary Concept:

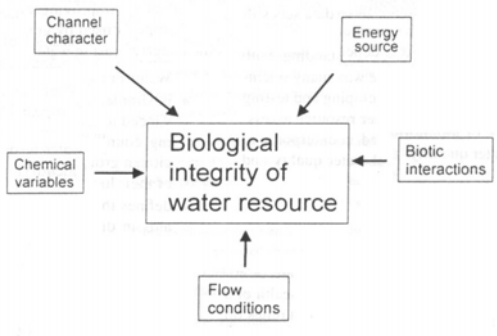
Rivers cannot continue to meet society's needs if humans continue to regard river management as a purely political or engineering challenge.

Human intents for water were assumed to be attainable by intensifying control of water and watercourses.

- Now water supplies are insufficient to meet growing demands,
- Our efforts to tame water have heightened our vulnerability to long-term fluctuations in climate and flow patterns and even brought about the unraveling of living aquatic systems.

Human activities degrade water resources by altering one of five water attributes:

1. water quality
2. habitat structure
3. flow regime
4. energy source
5. biotic interactions



River biota: mark of integrity

- The [presence] of living organisms represents the integration of conditions around them.
- [This] is the mark of integrity against which we can measure degradation.

The most direct and effective measure of a water body's integrity is the status of life in the water.

Living communities reflect watershed conditions better than any chemical or physical measure.

Two approaches to biological monitoring: RIVPACS & IBI

- (RIVPACS) River Invertebrate Prediction and Classification System.
- Index of Biological Integrity (IBI).
- Principle of both: biota is the ultimate integrator of all human actions.

IBI versus RIVPACS

Most important difference is the biological information used to frame the assessment process.

- Recognizing patterns of species composition continues to be the core of RIVPACS analyses.
- IBI was developed to measure river condition, or river health.
- [IBI includes] development of measurements for diagnosing causes of degradation.
- The biological signals that make up IBI analyses are broader.

What is IBI?

- IBI integrates multiple biological indicators to measure and communicate biological health.
- [IBI] has been tested and refined over two decades.
- Provides the foundation of US federal programs for biological monitoring.

Building a robust and effective IBI requires selecting measurable attributes that provide reliable and relevant signals about the effects of human activities.

The biological attributes incorporated into an IBI are called metrics.

- [Metrics] are chosen because they reflect specific, predictable responses of organisms to changes in landscape condition.
- They are sensitive to a range of [biogeochemical] factors that alter biological systems.
- They are relatively easy to measure and interpret.