

**Disciplina: Bioindicadores ambientais****45h**

**Ementa:** Uso de organismos como indicadores da qualidade ambiental, visando o monitoramento e conservação de ecossistemas terrestres e aquáticos. Efeito das variações ambientais nos sistemas bióticos: base para o conceito de bioindicadores; Conceitos e usos de bioindicadores; Critérios Gerais para Eleição de Bioindicadores. Métodos para avaliar indicadores (princípios do desenho experimental). Aplicação de bioindicadores: princípios básicos, seleção de espécies indicadoras, índices de diversidade e índices de biointegridade; Vantagem dos bioindicadores para os métodos tradicionais; Limitações de bioindicadores; Abordagens avançadas e estudo de caso.

**Bibliografia:**

- AGRAWAL, A., GOPAL, K. 2013. *Biomonitoring of water and waste water*. Springer, London.
- BAPTISTA, D.F., 2008. Uso de macroinvertebrados em procedimentos de biomonitoramento em ecossistemas aquáticos. *Oecologia Brasiliensis* 12: 425-441.
- BELLINGER, E.G., SIGEE, D.C. 2010. *Freshwater algae: identification and use as bioindicators*. Wiley-Blackwell, Oxford.
- CARIGNAN, V. & VILLARD, M., 2002. Selecting indicator species to monitor ecological integrity: A review. *Environmental Monitoring and Assessment* 78: 45–61.
- CONTI, M.E. (ed.) 2008. *Biological monitoring: theory & applications – Bioindicators and biomarkers for environmental quality and human exposure assessment*. WIT Press, Southampton.
- ESPINO, G. L.; PULIDO, S. H.; PÉREZ, J. L. C. 2000. *Organismos indicadores de la calidad del agua y de la contaminación*. Plaza y Valdes (Eds.), México.
- GESSNER, M.O., CHAUDET, E., 2002. A case for using litter breakdown to assess functional stream integrity. *Ecological Applications* 12: 498-510.
- HOLT, E.A., MILLER, S.W., 2011. Bioindicators: using organisms to measure environmental impacts. *Nature Education Knowledge* 3: 1-8.
- KARR, J.R., 1991. Biological integrity: a long-neglected aspect of water resource management. *Ecological Applications* 1: 66-84.
- LOEB, S.L., SPACIE, A. 1994. *Biological monitoring of aquatic systems*. Lewis Publishers, London.
- LYNCH, J.M., WISEMAN, A. 1998. *Biomonitoring: The Biotechnology Ecotoxicology interface*. Cambridge University Press, Cambridge.
- MAIA, N.B. & MARTOS, H. 1997. *Indicadores ambientais*. Sorocaba.

- MARKERT, B.A., BREURE, A.M., ZECHMEISTER, H.G. 2003. *Bioindicators & biomonitoring: principles, concepts and applications*. Elsevier, Oxford.
- MILLER, S.W., WOOSTER, D., LI, J., 2007. Resistance and resilience of macroinvertebrates to irrigation water withdrawals. *Freshwater Biology* 52: 2494–2510.
- NIEMI, G.J., MCDONALD, M.E., 2004. Application of ecological indicators. *Annual Review of Ecology, Evolution, and Systematics* 35: 89-111.
- SIMON, T.P. 2003. *Response signatures: indicator patterns using aquatic communities*. CRC Press, Boca Raton.
- SPELLERBERG, I., 2005. *Monitoring ecological change*, 2<sup>nd</sup> ed. Cambridge University Press, Cambridge.
- VAN STRAALEN, N.M., KRIVOLUTSKY, D.A. 1996. *Bioindicator systems for soil pollution*. Springer, Oxford.
- YOUNG, R.G., MATTHAEI, C.D., TOWNSEND, C.R., 2008. Organic matter breakdown and ecosystem metabolism: Functional indicators for assessing river ecosystem health. *Journal of the North American Benthological Society* 27: 605-625.

**Periódicos recomendados:** *Restoration Ecology; Journal of Applied Ecology; Ecological Applications; Ecological Indicators; Ecology and Society; Basic and Applied Ecology; Ecological Processes; Diversity and Distributions; PLoS Biology; Conservation Biology; Biological Conservation; Biodiversity and Conservation; Environmental Pollution; Water, Air & Soil Pollution; Environmental Conservation; Journal of Freshwater Ecology; Hydrobiologia; Limnology and Oceanography; Aquatic Conservation; Knowledge and Management of Aquatic Ecosystems; River Research and Applications; Nature; Science.*

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