*Level 2* uses *the ratio between groups of organisms*.
ستخدم المستوى 2 النسبة بين مجموعات الكائنات الحية. مثال مميز هو مؤشر الطحالب.Nygaard
اقترح Nygaard 1976) خمسة مؤشرات لتقييم التلوث العضوي للأجسام المائية بناءً على مجموعات مختلفة من الطحالب العوالق التي تحدث فيها.

.Level 3 is based on concentrations of chemical compounds

يعتمد المستوى 3 على تركيزات المركبات الكيميائية

وتستخدم مؤشرات عديدة حسب طبيعة المادة الكيمياوية ونوعية البيئة

وهذه المواد الكيمياوية تكون متعددة مثل تركيز الفسفور الكلي او المواد السامة والعناصر الثقيلة سوء كانت في الكائن الحي او في الماء بعد معد الرجوع الى القياسات المثالية لكل تركيز من هذه المواد بالتالي يعطي اشارة واضحة حول طبيعة البيئة وتقيمها بدرجات اونسب مئوية

*Level 4* applies *concentration of entire trophic levels as indicators*

المستوى الرابع هو مؤشر للمستوى التغذوي

the concentration of phytoplankton (as chlorophyll a or as biomass per m3) is used as indicator for the eutrophication of lakes. A high fish concentration has also been applied as indicator for a good water quality or birds as indicator for a healthy wetland ecosystem.

*Level 5* uses *process rates as indication, for instance, primary production determinations* are used as indicator for eutrophication either as maximum g C/(m2 day)or g C/(m3 day) or g C/(m2 year) or g C/(m3 year). A high annual growth of trees in a forested wetland is used as indicator for a healthy forested wetland ecosystem and a high annual growth of a selected population may be used as indicator for healthy environment. A high mortality in a population can on the other side be used as indication of an unhealthy environment. High respiration may indicate that an aquatic ecosystem has tendency to oxygen depletion.

Level 6 covers composite indicators

هذه المؤشرات المركبة وضحها E.P. Odum’s الذي وضع استراتيجية تطوير للنظام البيئي كما في الجدول ادناه توضح تتوافق المرحلة المبكرة للبحيرات والخزانات مع مرحلة ضعيفة وغير مستدامة ومرحلة النضج لمرحلة مستدامة

Examples are biomass, respiration/biomass, respiration/ production, production/biomass, and ratio primary producer/consumers. E.P. Odum uses these composite indicators to assess whether an ecosystem is at an early stage of development or a mature ecosystem

Differences between Initial Stage and Mature Stage Are Indicated[a]

| Properties | | Early Stages | Late or Mature Stage |
|---|---|---|---|
| *A* | *Energetic* | | |
| | P/R | $\ll 1$ or $\gg 1$ | Close to 1 |
| | P/B | High | Low |
| | Yield | High | Low |
| | Specific entropy | High | Low |
| | Entropy production per unit of time | Low | High |
| | Exergy | Low | High |
| | Information | Low | High |
| *B* | *Structure* | | |
| | Total biomass | Small | Large |
| | Inorganic nutrients | Extrabiotic | Intrabiotic |
| | Diversity, ecological | Low | High |
| | Diversity, biological | Low | High |
| | Patterns | Poorly organized | Well organized |
| | Niche specialization | Broad | Narrow |
| | Size of organisms | Small | Large |
| | Life cycles | Simple | Complex |
| | Mineral cycles | Open | Closed |
| | Nutrient exchange rate | Rapid | Slow |
| | Life span | Short | Long |
| *C* | *Selection and homeostatis* | | |
| | Internal symbiosis | Undeveloped | Developed |
| | Stability (resistance to external perturbations) | Poor | Good |
| | Ecological buffer capacity | Low | High |
| | Feedback control | Poor | Good |
| | Growth form | Rapid growth | Feedback controlled |
| | Growth types | R-strategists | K-strategists |

[a] A few attributes are added to those published by Odum (1969, 1971).

TABLE 1. A selection of Odum's 24 attributes of ecosystem maturity. Characteristic values for ecosystems in developmental or mature stages are presented for the selected attributes.

| | Ecosystem attributes† | Developmental stages | Mature stages |
|---|---|---|---|
| 1 | Gross production/respiration | >1 or <1 | Approaches 1 |
| 2 | Gross production/biomass | High | Low |
| 3 | Biomass supported/energy flow | Low | High |
| 4 | Net community production | High | Low |
| 6 | Total organic matter | Small | Large |
| 12 | Niche specialization | Broad | Narrow |
| 13 | Size of organism | Small | Large |
| 15 | Mineral cycles | Open | Closed |
| 16 | Nutrient exchange rate between organisms and environment | Rapid | Slow |
| 17 | Role of detritus in nutrient cycling | Unimportant | Important |
| 21 | Nutrient conservation | Poor | Good |
| 22 | Stability (resistance to external perturbations) | Poor | Good |

† Only attributes that can be quantified using trophic mass-balance models are included. The numbering refers to Odum's (1969) original numbering.

*Level 7* encompasses *holistic indicators such as resistance, resilience, buffer capacity, biodiversity*, all forms of diversity and size, and connectivity of the ecological network, turnover rate of carbon, nitrogen, etc., and of energy., high resistance, high resilience, high buffer capacity, high diversity, big ecological network with a medium connectivity, and normal turnover rates are all indications of a healthy ecosystem.

*Level 8* indicators are *thermodynamic variables*, which we may call superholistic indicators as they try to see the forest through the trees and capture the total image of the ecosystem without inclusion of details. Such indicators are exergy, eco-exergy or work capacity, emergy, entropy production, power, mass, and/or energy system retention time. The economic indicator cost/benefit (which includes all ecological benefits—not only the economic benefits of the society) belongs also to this level.