

“Capacity Building and Strengthening Institutional Arrangement”

Analysis and sampling of water and water pollution

Environmental training of experts to use DPSIR model

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APAT

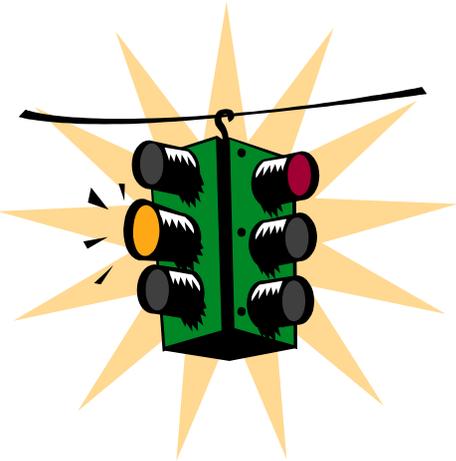
Agency for Environmental Protection and Technical Services

I'm looking for right environmental indicators....

Using DPSIR model I need Indicators which suit well for the state of the environment I'm investigating.....

What I need for right indicators???

General criteria for selecting environmental indicators:



- Policy relevance and utility for users;
- Analytical soundness;
- Measurability.

These criteria describe the “ideal” indicator: not all of them will be met in practise!!! (i.e. lack of data)

Policy relevance and utility for users



An environmental indicators should:

- Provide a representative picture of:
the environmental conditions;
pressures on the environment;
society's responses;
- Be simple, easy to interpret and able to show trend over time;
- Be responsive to changes in the environment and related human activities;

more on Policy relevance and utility for users



An environmental indicators should:

- Provide a basis for international comparison;
- Be either national in scope or applicable to regional environmental issues (limit) of national significance (objectives);
- Have a threshold or reference value against which to compare it, so that users can assess the significance of the value associated with it.

Analitical soundness



- Be theoretically well founded in technical and scientific terms;
- Be based on international standards and international consensus about its validity;
- Lend itself to being linked to economic models, forecasting and information systems.

Measurability



The data required to support the indicator should be:

- Readily available or made available at a reasonable cost/benefit ratio;
- Adequately documented and of known quality;
- Updated at regular intervals in accordance with reliable procedures.



How can we represent indicators? By fact-sheet

The fact-sheet is the tool for:

- a) building the indicator: it contains details on the parameters/metrics that have to be used, therefore
- b) it is the "frontpage" of each indicator, providing an immediate view of the data availability.

The indicator fact-scheet is composed of two parts: a fixed one with **metadata** component and a dinamic one, where **data** are shown according to the collecting frequency of the indicator.



Metadata

- Title;
- Description;
- Aim and limits;
- Measure unit;
- Updating;
- Objectives fixed by law;
- Source of information.

Data

- Tables;
- Graphes;
- Quality of information;
- State and trend;
- Comments on tables and graphes.

TITOLO	BOD5 Title
N°	AIM/Ob. 04.1/005
TEMA (SEZIONE)	T 05.1
DPSIR	Stato
DESCRIZIONE DELL'INDICATORE	Si misura la richiesta biologica di ossigeno (Biochemical Oxygen Demand) nelle acque, cioè la quantità di ossigeno consumato nei processi di ossidazione delle sostanze organiche in 5 giorni T 05.1: macrodescrittore; obbligatorie per acque potabili e salmonicole e ciprinicole
METODI DI MISURA	Determinazione dell'ossigeno disciolto prima e dopo incubazione di 5 giorni al buio. Aggiunta di un inibitore di nitrificazione (preferibilmente alliltiourea) IRSA-CNR
SCOPO DELL'INDICATORE	Indicatore generico di inquinamento. Ha soprattutto un valore storico, in quanto da tempo e diffusamente utilizzato
INDICATORI COLLEGATI	COD, Ossigeno Disciolto, TOC
UNITÀ DI MISURA	mg/l
LIVELLO GEOGRAFICO DI RIFERIMENTO	Corsi d'acqua e laghi significativi (D.Lgs 152/99)
POSSIBILE RAPPRESENTAZIONE	Tabellare riassuntiva, istogrammi e simili, rappresentazioni cartografiche
DOCUMENTO DI RIFERIMENTO	Dobris+3 (Scheda 9.04), Eu Report 1998 (Scheda 3.9.2.2)
RIFERIMENTO NORMATIVO	D.Lgs 152/99 All. 1 (3.2), All. 2 (Sez. A e B)
LIMITE DELL'INDICATORE	

Description

Aim

Measure unit

ESPRESSIONE ALTERNATIVA DELL'INDICATORE	
PAROLE CHIAVE	BOD, ossigeno disciolto, inquinamento organico.
COPERTURA GEOGRAFICA DEI DATI	
PERIODO DI RIFERIMENTO DEI DATI	
METODO DI ELABORAZIONE	
PROBLEMI DI AGGREGAZIONE DEI DATI	
MAPPE/DOCUMENTI/PROGETTI/MODELLI COLLEGATI	
SORGENTI DI DATI	Regioni, Provincie, ARPA, APPA, PMP, LIP, USL, ASL, ISS, Ist. Idrobiologia, CNR, Università
FORMATO DEI DATI	Verrà indicato nello specifico DM di prossima pubblicazione ai sensi dell'art. 3 comma 4 del D.Lgs 152/99
COMPILAZIONE DEI DATI	
CONTATTI	
INDIRIZZI INTERNET UTILI	
ULTERIORI AZIONI/RICHIESTE	
OSSERVAZIONI E COMMENTI	Il BOD è un indicatore di inquinamento organico ampiamente utilizzato, ma in nessun caso può essere considerato come criterio unico di valutazione della qualità delle acque, anche perché possono intervenire cause di inibizione per la presenza di sostanze tossiche o questi valori possono essere aumentati per la presenza nel campione di microplancton, alghe o altri microorganismi.

Source of information

Comment

Metadata

Title: *Ecological State of Rivers* (SECA)

Description: The *Ecological State of Rivers* is a sintetic index introduced by the 152/99 Italian law, which defines the ecological status of the rivers as expression of the complexity of the aquatic ecosystems and of the chemical and physical nature of the waters, considering as a priority the state of the biotic elements of the ecosystem. It is determined by integrating the Level of pollution by macrodescriptors (LIM – i.e. DO, BOD₅, COD, NH₄, NO₃, Total P, *Escherichia coli*) with the Extended biotic Index (IBE, i.e. presence of sensitive taxa and total richness of taxa).

Calculation of SECA

	Class 1	Class 2	Class 3	Class 4	Class 5
IBE	310 - 10/9	8/7-8-8/9-9-9/10	6/5-6-6/7-7-7/8	4/3-4-4/5-5-5/6	1-2-3
LIM	480 - 560	240 - 475	120 - 235	60 - 115	< 60
SECA	High	Good	Moderate	Poor	Bad

Source: Italian law 152/99.

Measure unit: quality classes (from 1 to 5);

Aim and limits: the aim of the index is to define the ecological status of the rivers due to the impacts of the major antropic pollutants coming from urban waste waters and from widespread sources, as well as from the physical and morphological changes of the rivers which insist on the quality of waters, sediments and biota.

Updating: annual.

Objectives fixed by the law: According to the 152/99 Italian law, within 2016 each river, or part of it, must reach the status of environment quality equal to Good. In order to get this goal each river, or part of it, must reach, within 2008, at least the status of environment quality equal to Moderate.

Source of information: Regional and Provincial Agencies for the protection of the environment; Piemonte Region; Prvincial Administrations of Padoa, Rovigo and Belluno; Sardegna Region and Abruzzo Region.

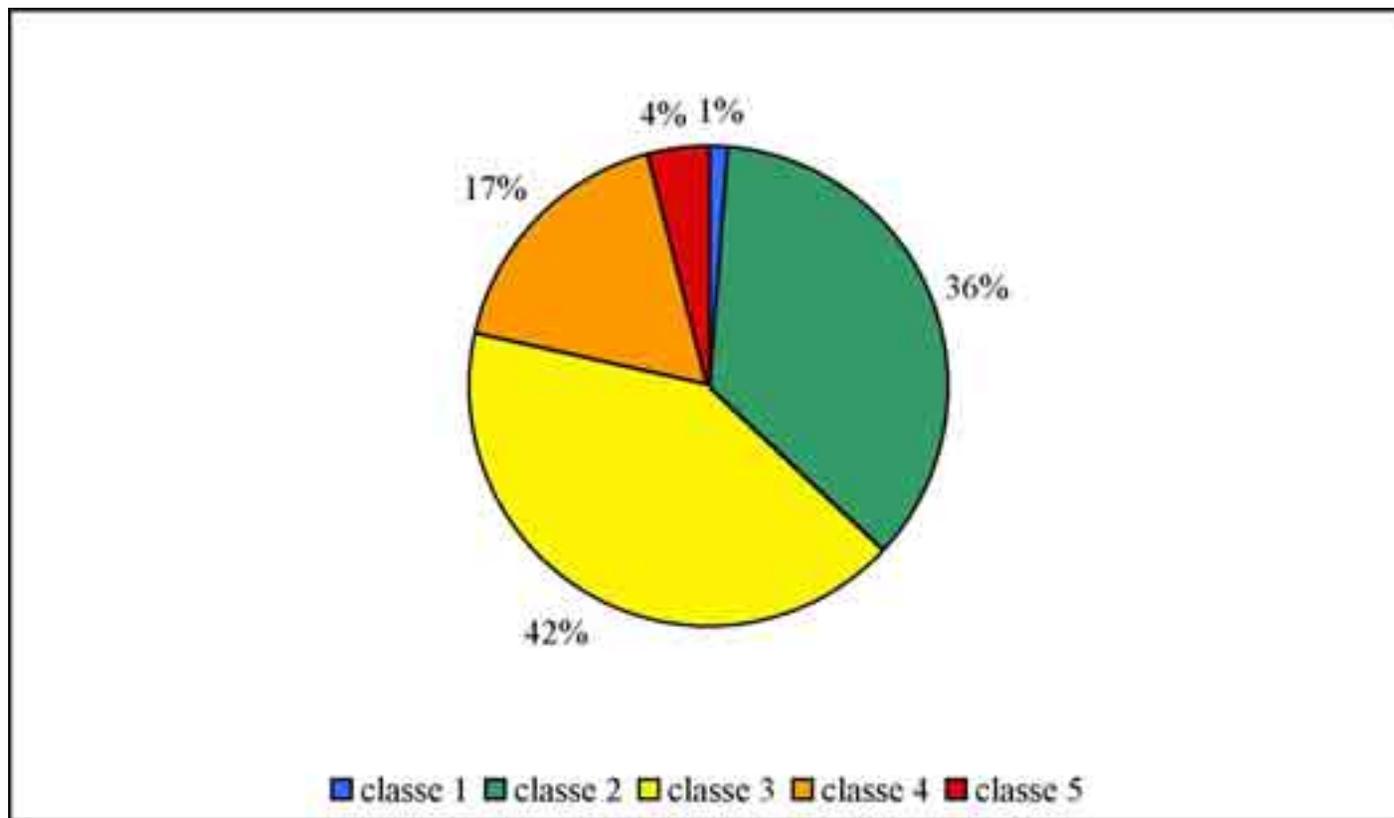
Data

Table:

Region	Basin	River	City of	Location	Province	SECA
Valle d'Aosta	Po	Dora Baltea	La Salle	Ponte Equilivaz	AO	3
Valle d'Aosta	Dora Baltea	Dora Baltea	Courmayeur	Dietro funivia Val Vény	AO	2
Lombardia	Po	Lambro sett.	Melegnano	Al termine di Via Powell	MI	5
Campania	Volturno	Calore Irpino	Montella	Sogente Varo della Spina	BN	1
Sicilia	Simeto	Alcantara	Calatabiano	S.Marco	CT	4

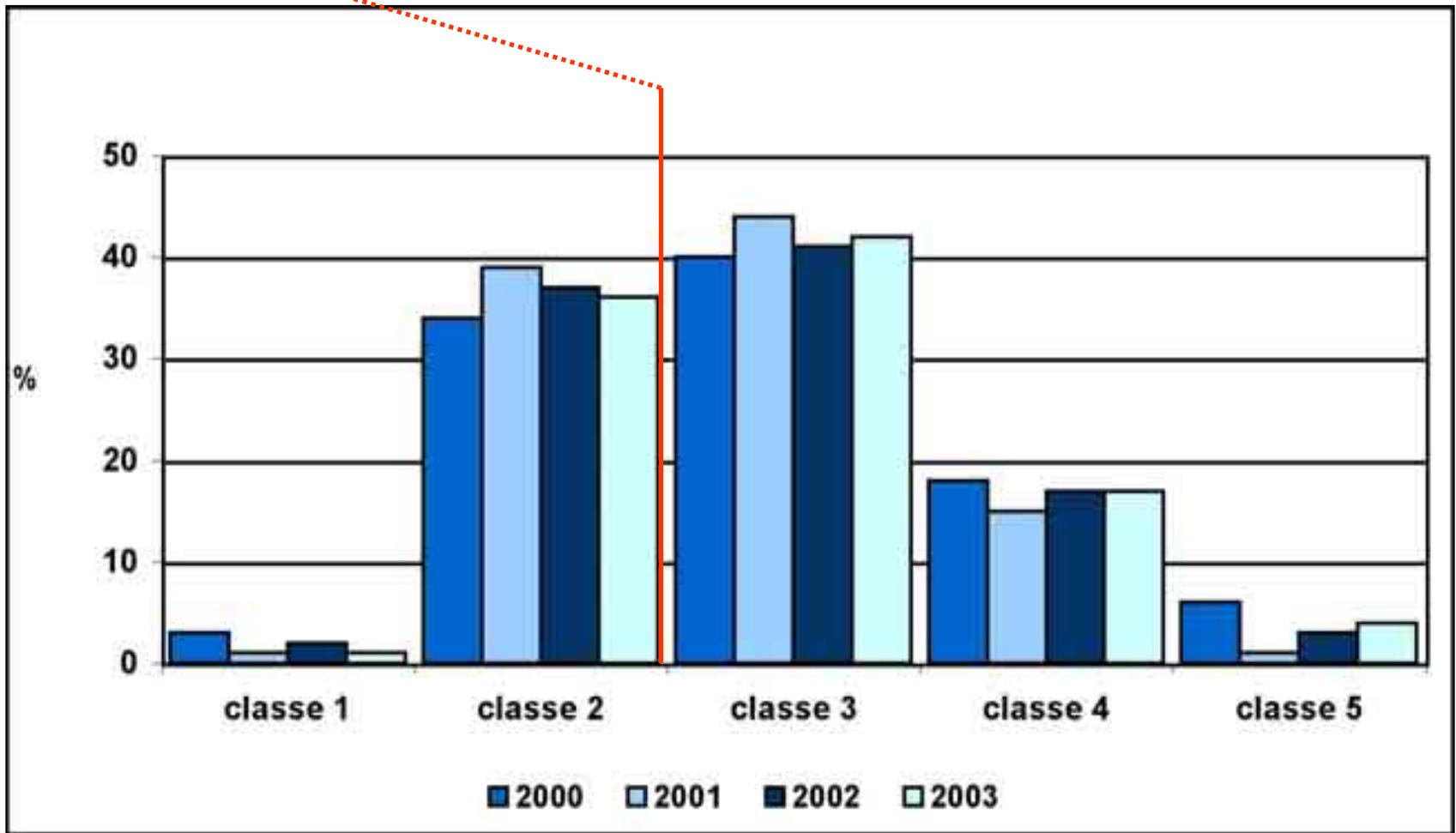
Graphes:

SECA of Italian rivers year 2003



SECA trend from 2000 to 2003

100% Environmental objective

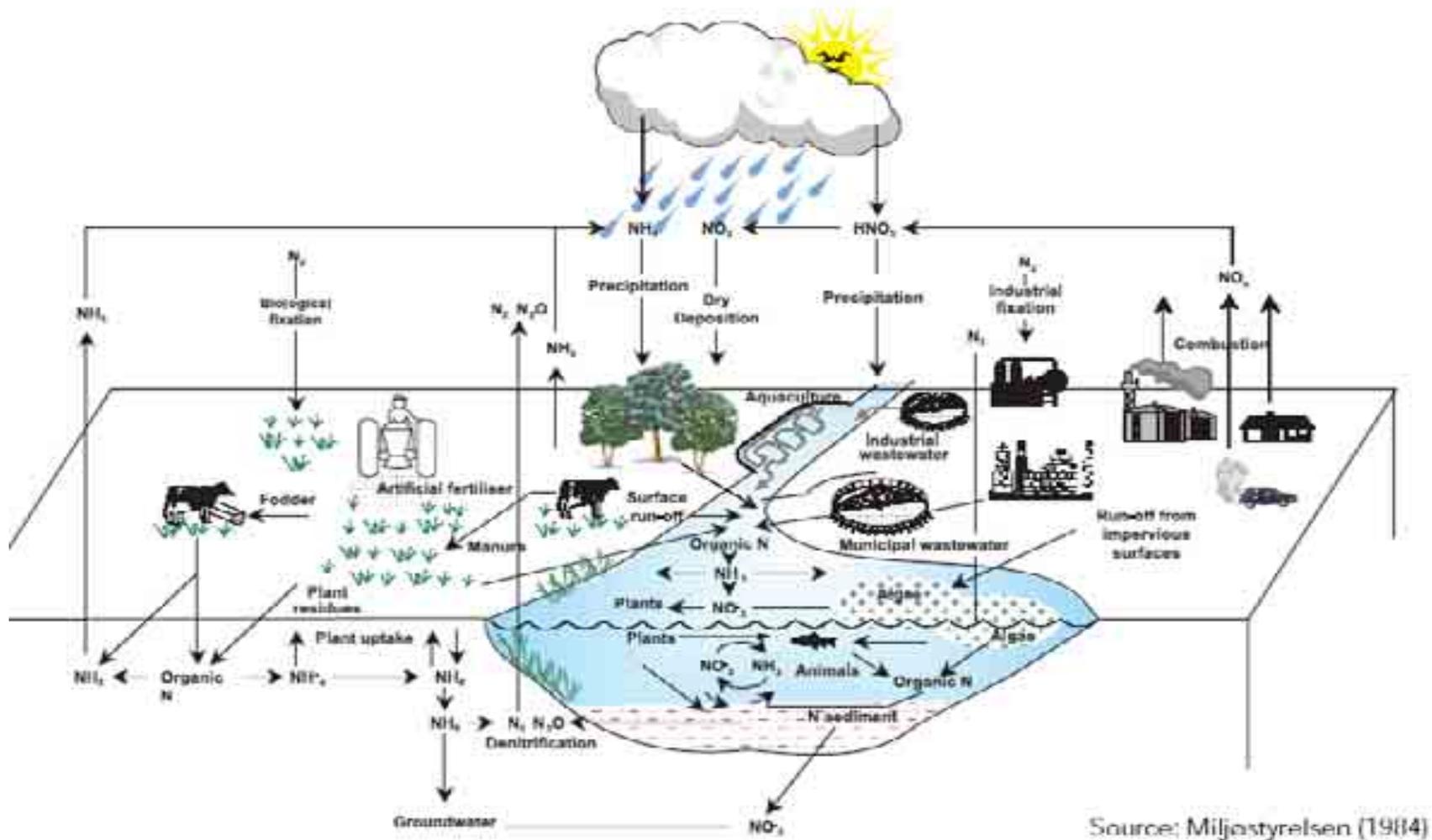


Quality of information: *it is given a score taking into account how the given information answers to the general criteria for environmental indicators.*

State and trend: “...in 2003 SECA was monitored in 618 sites, distributed over the all Italian territory. The distribution over the 5 classes of quality shows a complessive non critical status of quality. The trend, from 2000 to 2003, shows....”

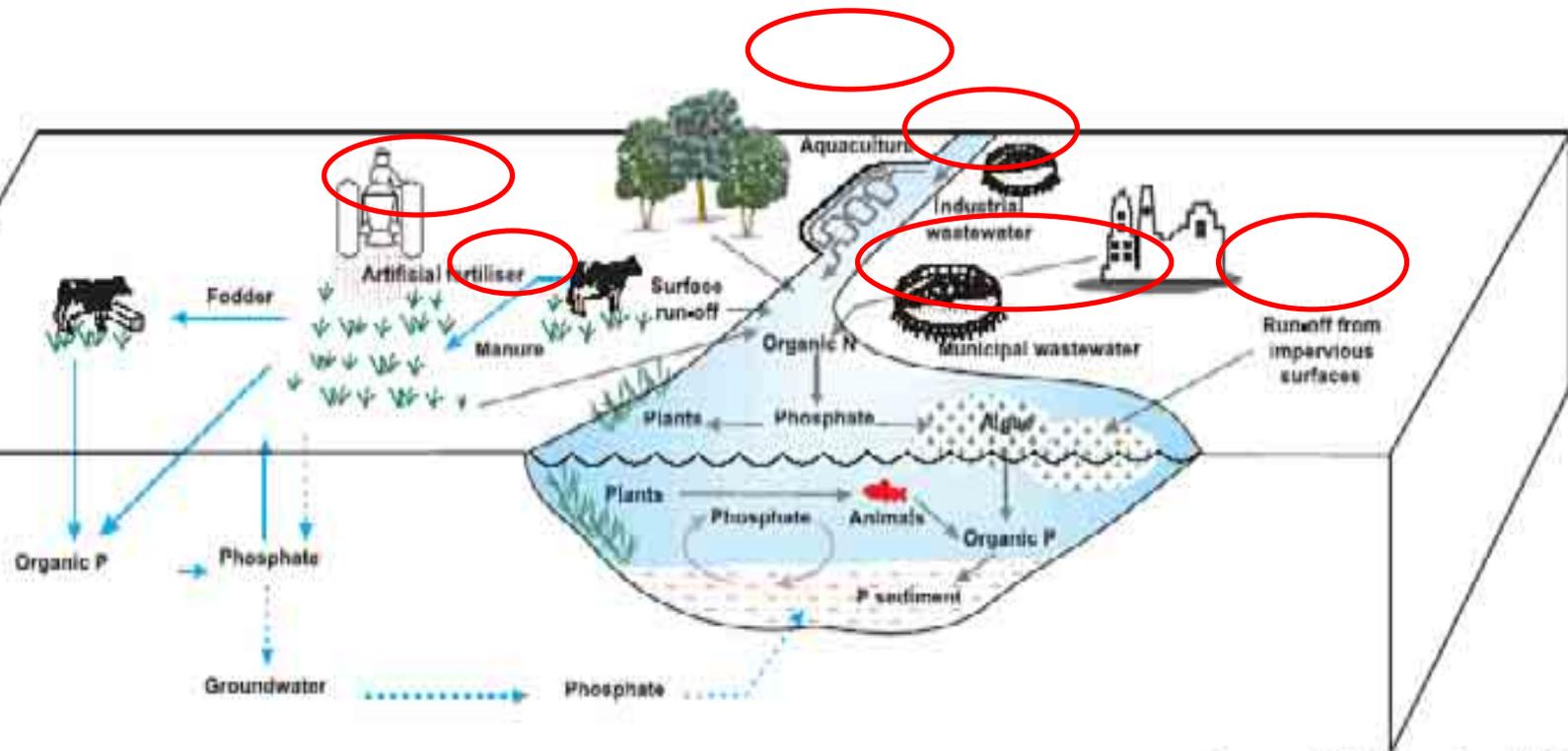
Comments on tables and graphes:”in 2003, 78% of sites are between the moderate and high status of environmental quality. In particular, 36% of the monitored sites is in good quality and 42% is in moderate quality”....

Nitrogen cycle in the environment



Source: Miljøstyrelsen (1984)

The phosphorus cycle in the environment



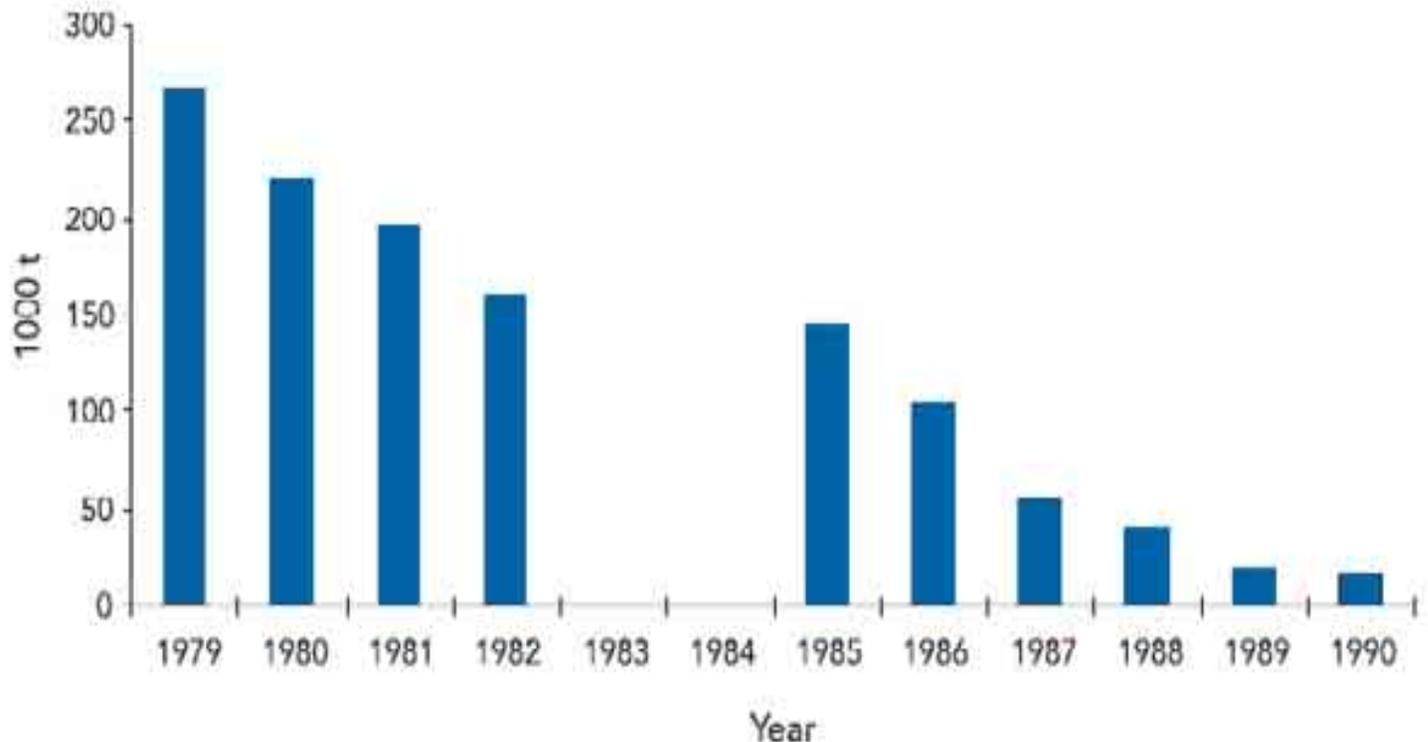
Source: Miljøstyrelsen (1984)

Metadata from EEA Report

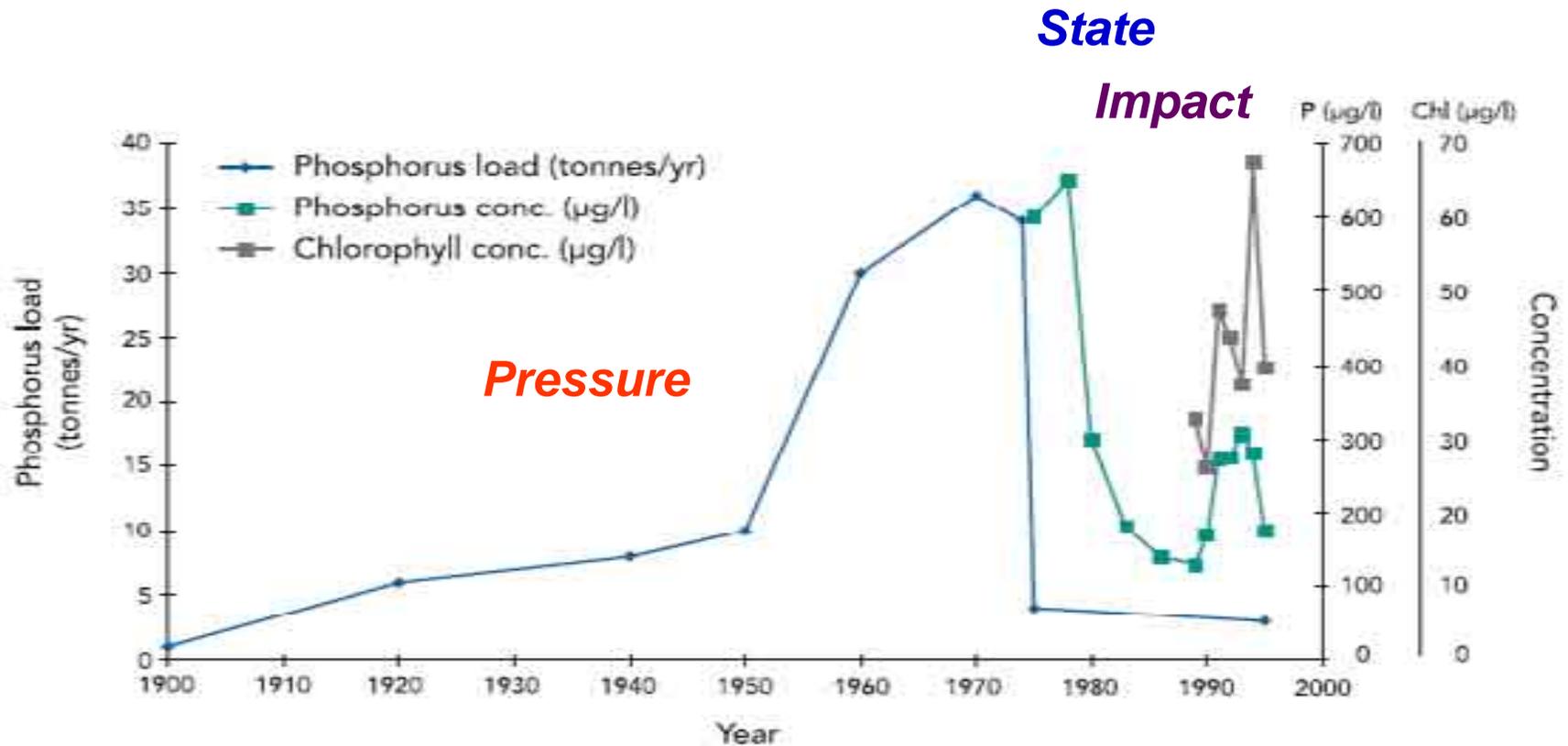
- **Title:** consumption of polyphosphate in detergents.
- **Description:** The indicator describes the amount of phosphorus loading in household detergents.
- **Measure unit:** Tonn/year
- **Aim and limits:** The aim of the indicator is to focus the attention of the pressure on the water bodies coming from municipal wastewater.
- **Updating:** annual.
- **Source:** Umweltbundesamt (1994).

Data

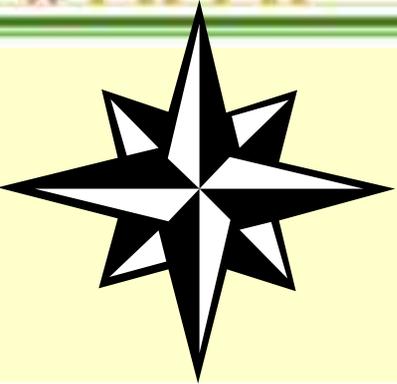
Consumption of polyphosphates in detergents Old German Länder



Phosphorus load and in-lake concentrations of phosphorus and chlorophyll a in Lake Fureso, Denmark.



Source: compiled by ETC/IW.

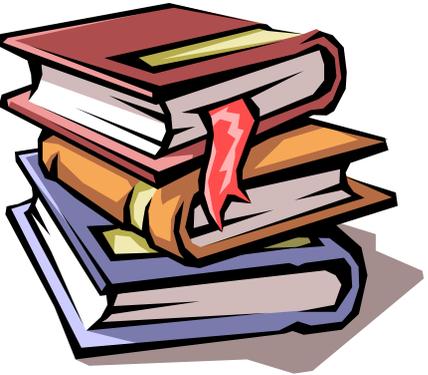


For the all information on:

- The DPSIR model applied to the Italian status of the waters;
- List of Italian indicators on the status of the waters;
- Fact-sheet on Italian indicators on water.

- EEA. Nutrients in European ecosystems – Environmental assessment report No.4 (1999)

Look at these web-sites:



1. ITALIAN ENVIRONMENTAL YEARBOOK

http://www.apat.gov.it/site_contentfiles/00140000/140076_Annuario_2004_Versione2.pdf

12 “Chapter Hydrosphere”

2. ENGLISH SUMMARY

http://annuario.apat.it/databaseannuario/apat/annuario2004/pdf_files/sintesi_inglese.pdf

12 “Chapter Hydrosphere”

