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World Health Organization

GUIDELINES ON RECREATIONAL WATER QUALITY

Volume 1 Coastal and Fresh Waters

Examples of management and communication

- Enforce compliance with regulations. For catchment pollution from human or nonhuman sources, identify major sources of pollution and develop a catchment-wide pollution abatement programme (refer to section 4.4).
- Manage pollution of recreational waters by human or animal wastes containing faecal bacteria or pathogens through system upgrades (e.g. tertiary treatment of human effluent for direct point-source pollution and/or appropriate disposal of human effluent through long outfalls to separate discharges from water users).
- Public health authorities should be engaged in defining water quality standards or appropriate triggers relevant to exceptional circumstances (e.g. sewer breaks, extreme floods and rainfall events with a recurrence interval of more than 5 years).
- Develop predictive models for real-time operational monitoring and public communications, where feasible (refer to section 4.2.3).
- Post advisory notices of likely adverse water quality if:
  - weather events, such as high rainfall, lead to elevation of FIOs in recreational waters;
  - a rare or extreme event causes gross pollution of the bathing water; or
  - sewage, septic tank effluent and/or faecal sludge discharges occur that are unrelated to weather events.

Chapter 5: Harmful algal blooms (HABs)

Indicators and guideline values

Freshwater and brackish water bodies[a]

[a] Available only for freshwater HABs because of lack of data for recreational exposure to marine HAB toxins.

Cyanobacterial biomass indicator values (thresholds in Fig. 5.1 alert level framework):

- Vigilance level – 1–4 mm^3/L biovolume or 1–12 µg/L chlorophyll *a* (with dominance of cyanobacteria).
- Alert Level 1 – 4–8 mm^3/L biovolume or 12–24 µg/L chlorophyll *a* (with dominance of cyanobacteria).
- Alert Level 2 – scum or transparency <0.5–1 m.

Note that clear water bodies with far lower plankton biomass may harbour toxic cyanobacteria growing on surfaces such as sediments and submerged plants as mats, which can detach and float in the water or be washed ashore.

Cyanotoxin guideline values (thresholds in Fig. 5.1. alert level framework):

- Microcystin $GV_{recreation}$ – 24 µg/L (provisional).
- Cylindrospermopsin $GV_{recreation}$ – 6 µg/L (provisional).
- Anatoxin-a $GV_{recreation}$ – 60 µg/L (conservative health-based reference value due to lack of effects in chronic studies).
- Saxitoxin $GV_{recreation}$ – 30 µg/L

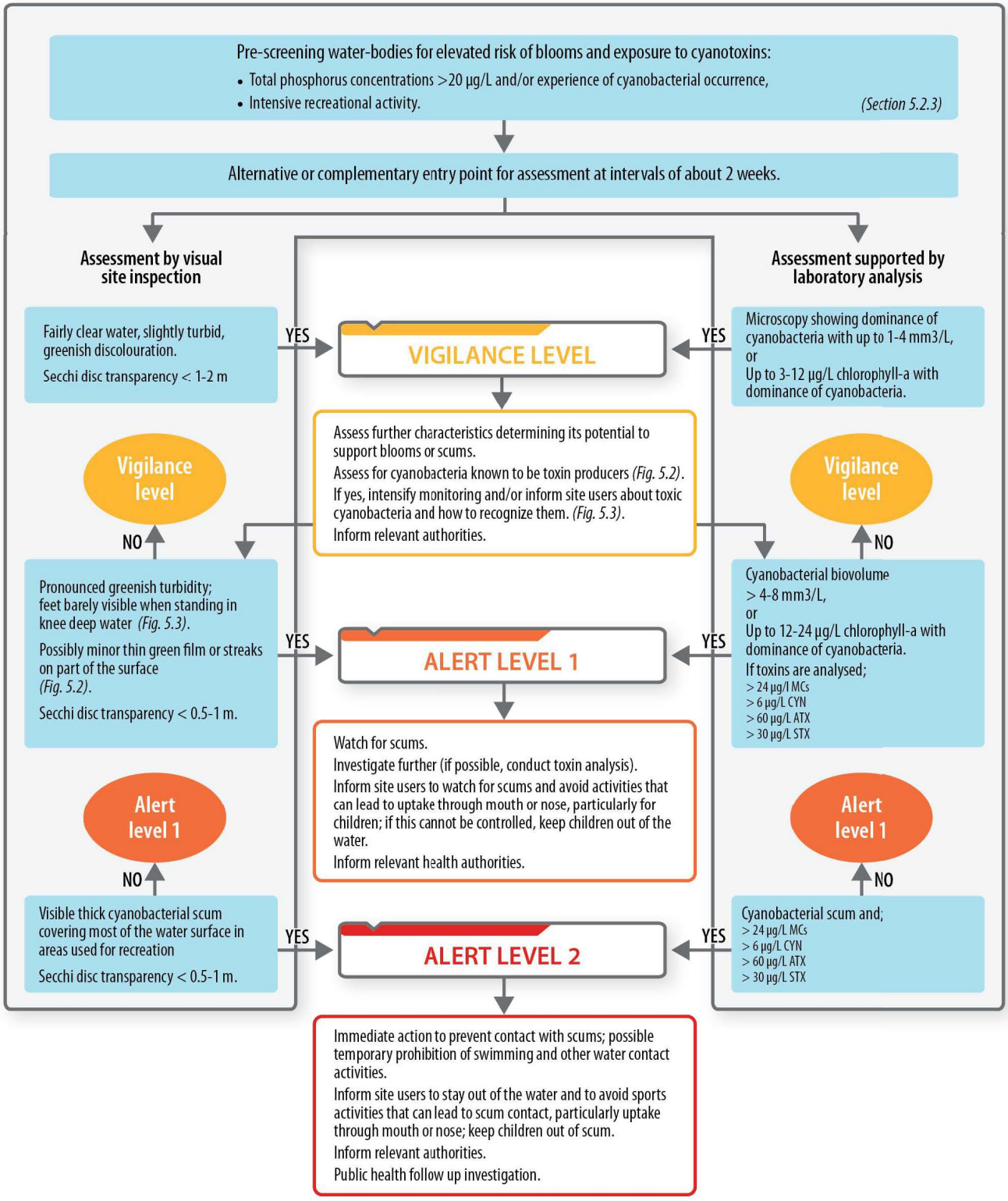
System assessment

- Develop a surveillance strategy that gives priority to the highest-risk sites based on the likelihood of toxic blooms and patterns of recreational use (refer to Table 5.2).
- Develop an understanding of water body conditions (including under predicted local climate change scenarios), as the basis for assessing risks of bloom occurrence and thus of exposure during recreational activities (e.g. excluding fast-flowing rivers where blooms cannot form and lakewater aerosols).
- Compile an inventory of activities in the catchment causing nutrient loads that sup-port HABs.

Fresh water:

- Use total phosphorus concentrations above 20 µg/L and/or cyanobacterial occur-rence as a screening level for water bodies at risk of planktonic HABs, taking note of the possibility of HABs growing on surfaces in clear water bodies with lower total phosphorus concentrations.
- Choose parameters (e.g. biovolumes) that indicate potential levels of cyanotoxins, and define the levels that trigger specific actions.

Fig. 5.1
Alert level framework for monitoring and managing cyanobacteria in recreational water bodies



Source: Chorus & Testai (*Toxic cyanobacteria in water*, 2021).

Fig. 5.2
Alert Level 1 conditions observed as streaks, specks and Secchi disk transparency

Fig. 5.3
Simple guidance for checking presence of potentially unsafe levels of non-scum-forming cyanobacteria

Alert levels for non-scum-forming cyanobacteria

Check for yourself:

- Carefully wade into the water up to your knees, without stirring up mud or sediment.
- Can you still see your toes?
- If not or only barely, swim elsewhere.

Source: TCiW, Chorus & Testai (2021).

Alert level 1

Alert level 2