

## ***Interactive comment on “Detecting marine hazardous substances and organisms: sensors for pollutants, toxins, and pathogens” by O. Zielinski et al.***

**Anonymous Referee #1**

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This paper presents an overview of emerging technology and sensors for detection of marine contaminants, marine biotoxins and pathogens in the marine environment. The review is very broad in its scope and covers a wide range of parameter groups and technologies. Specifically, it examines remote sensing technologies, in situ platform measurement and in situ point measurement, although some of the techniques discussed in the latter section might not be classed as in situ. It is comprehensive in its coverage of these areas and well referenced. I found it clear and well written, generally well structured, and informative.

Specific comments In the introduction section (line25 p 995) listing examples of global

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and regional monitoring programmes a 6th example could be the monitoring in accordance with regional sea conventions such as OSPAR and HELCOM

P958 Line 18. This is a query: I am surprised to see agricultural feed/growth promoters listed as a major source of hormones. Maybe that is true globally but certainly in Europe their use is now banned.

in section 3.1.1 (p965 – 966) dealing with remote sensing it is highlighted that while remote sensing of toxins is not possible, detection of blooms is possible and may be a proxy for detecting toxic occurrences. It could be noted for completeness that toxic events can often be associated with low biomass limiting these techniques in these instances (e.g. azaspiracids).

3.1.2. This section understates some of the practical difficulties in using sensors in the field, most obviously the effect of fouling on data quality. In mentioning the need for “..hardened, reliable instruments for long duration deployment”, the authors could also highlight the need for appropriate and consistent accuracy, sensitivity and selectivity that is required for use in monitoring programmes. Sensor performance needs to be underpinned by quality assurance data using reference methods. In many instances deployment of autosamplers alongside sensors enables collection of reference samples for this purpose. (Alternatively this could be brought out at the end of section 4)

Technical corrections

P 957 13 “...distinguish between man-made marine pollution...” I suggest the term anthropogenic is better than man-made as the latter suggests only synthetic substances.

P958 Line 10 “petroleum hydrocarbons, including mineral oils and polyaromatic hydrocarbons” might be more accurate

P969 Line 17 & 24. BSA – Should this be BSH?

P978 Line 25: Should state Endocrine-disrupting compounds (not hormones). The

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substances such as phthalates used as plasticizers mimic hormones.

P984 Line 12: would read better as "...risk of releasing toxic substances over time."

P986 Line 9 Should read: "A largely overlooked hazard...".

Table 1. does not cover all commercially available sensors, e.g. envirotech in situ nutrient analysers

Fig.2 Typo – Substance and Organism

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Interactive comment on Ocean Sci. Discuss., 6, 953, 2009.