

Name	Total Phosphorous (surface sediment)													
DPSIR classe	Impact													
ECASA subgroups	Sediment													
ECASA code	TPSURF													
Proposed by participant	14 – Venice University													
Definition, computation,	A "relative" rank can be obtained by considering the ratio between the value of the measure at the impacted and reference site, see fig. 1. The calculation of this ratio, implies the application of a control or multi-control sampling strategy (Porrello et al., in press).													
Data required	Total Phosphorous concentrations are expressed as % of P in sediment. The concentration can be referred to the whole 6 to 10 cm core or to the surficial sediment (1 to 1.5 cm) (Porrello et al., in press; Aspila et al., 1976).													
Summary, scientific meaning, implementation	The production of biodeposits (faeces and pseudofaeces) due to mussel cultivation, can cause an enrichment of organic matter in the sediment. If we also consider mussel and epibiota drop-off during harvesting, much higher rates would be expected and longline mussel production may thereby dramatically alter the benthic environment. However, relatively little is known of the effects of longline mussel farming on benthic ecology, microbial mineralization and nutrient dynamics (Christensen et al., 2003). In the aim of a better understanding of nutrient dynamics, Total Phosphorous concentration, a parameter complementary to the reactive phosphorus, can be reasonably included in a set of benthic geochemical indicators.													
Range of validity	<table border="1"> <thead> <tr> <th></th> <th>Mean Surficial layer (1.5 – 2 cm)</th> <th>Ratio to reference (imp./[ref.])</th> <th>References</th> </tr> </thead> <tbody> <tr> <td>TP reference station [%]</td> <td>0.063</td> <td></td> <td rowspan="2">Porrello et al., in press</td> </tr> <tr> <td>TP impacted station [%]</td> <td>0.093</td> <td>1.48</td> </tr> </tbody> </table>				Mean Surficial layer (1.5 – 2 cm)	Ratio to reference (imp./[ref.])	References	TP reference station [%]	0.063		Porrello et al., in press	TP impacted station [%]	0.093	1.48
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TP reference station [%]	0.063		Porrello et al., in press											
TP impacted station [%]	0.093	1.48												
Species concerned (fishes/molluscs)	All													
Related type of aquaculture	1. Mussel culture: Longlines ; Rafts finfish culture ; 2. Marine cages (Porrello et al., in press).													
Relevant environments for this indicator	Sheltered areas; Coastal waters not protected by bays													
Geographic scale	local													

ECASA indicator

Direct relevance to objectives	A
Clarity in design.	A
Realistic collection or development costs	B
High quality and reliability	
Appropriate spatial and temporal scale	B
Obvious significance	B
advantages	
disadvantages	
references	Aspila, K.I., Agemian, H., Chau, A.S.Y., 1976. A semiautomated method for the determination of inorganic, organic and total phosphate in sediments. <i>Analyst</i> , 101, 187– 197. Christensen, P.B., Glud, R.N., Dalsgaard, T., Gillespie, P., 2003. Impacts of longline mussel farming on oxygen and nitrogen dynamics and biological communities of coastal sediments. <i>Aquac.</i> 218: 567-588. Porrello, S., Tomassetti, P., Manzueto, L., Finoia, M.G., Persia, E., Mercatali, I., Stipa, P., in press. The influence of marine cages on the sediment chemistry in the Western Mediterranean Sea. <i>Aquac.</i>
State of validation	
recommendations	