-Name	**Carbon quality (Rp index)**
DPSIR class	Impact
ECASA sub-group	Sediment
ECASA code	Rp
Proposed by participant	1 - SAMS
Definition, computation,	Rp = (%LOI@500/(%LOI@500+%LOI@250)) giving values in the range 0-1. Where %LOI@250 = the % loss of weight of a sediment sample (freeze dried, from which is derived an additional indicator: Water Content) after 16h at 250C (operationally defined as Labile Carbon) Where %LOI@500 = the % loss of weight of the same sample heated for a further 16h at 500C (operationally defined as Refractory Carbon)
Data required	Simple measures of sample weight pre- and post-combustion.
Summary, scientific meaning, implementation	Rp index is based on measurements of Loss on Ignition (LOI), which is equivalent to Total Organic Carbon
Range of validity	This has not been well established in the literature for aquaculture, but there is a good literature of correlations of Rp with e.g. distance from land. Studies by Dean (PhD Thesis, SAMS, 2005) have shown a good correlation between the lability of sedimentary OM as estimated by %LOI@250 and depth in sediment under a salmon farm. This indicator may be useful coupled to DEPOMOD output with the G-model of carbon degradation switched on. DEPOMOD model development to allow prediction of Rp is underway outside ECASA.
Species concerned (fishes/molluscs)	All
Related type of aquaculture	The indicator applies to all forms of carbon loading on sediments.
Relevant environments for this indicator	All intertidal and subtidal environments where it is possible to sample sediments.
Geographic scale	Local
Direct relevance to objectives	
Clarity in design.	
Realistic collection or development costs	
High quality and reliability	
Appropriate spatial and temporal scale	
Obvious significance	

advantages	The main advantage of this indicator is that it requires very simple apparatus (an oven) and is therefore low in cost. Many samples can be processed at the same time. It might be expected to work very well in fish farms owing to the high flux of labile OM to sediments, and it should be possible to use this to evaluate recovery status. This indicator is less complex and time-consuming than TOC measurements, which are routinely carried out in EIA studies yet correlate very poorly with impact as TOC includes both labile and refractory material.
disadvantages	There are some data in the literature but generally little for fish farms
References	Kristensen, E. and Andersen, F. O. (1987) Determination of Organic-Carbon in Marine-Sediments - a Comparison of 2 CHN-Analyzer Methods. *Journal of Experimental Marine Biology and Ecology* 109**,** 15-23. Kristensen, E. (2000) Organic matter diagenesis at the oxic/anoxic interface in coastal marine sediments, with emphasis on the role of burrowing animals. 426**,** 1-24. Loh, P. S., Reeves, A. D., Overnell, J., Harvey, S. M. and Miller, A. E. J. (2002) Assessment of terrigenous organic carbon input to the total organic carbon in sediments from Scottish transitional waters (sea lochs): methodology and preliminary results. *Hydrology And Earth System Sciences* 6**,** 959-970.
State of validation	Not currently used in EIA. This index could easily be measured in any sampling scheme involving sediments. Ideally several cores on a transect from a fish farm would be sliced (e.g. at 1 cm intervals to 10-15 cm depending on accumulation rate) but it may be sufficient to take surface samples only where grabs are being deployed rather than cores. This could be determined within the project.
recommendations	To be given according to the results of the field tests