

2013/2/ SSGHIE10 The Joint Rijkswaterstaat/DFO/ICES Workshop: Risk Assessment for Spatial Management (WKRASM), chaired by Rob Gerits*, Netherlands and Roland Cormier*, Canada, will meet in The Hague, The Netherlands, 24–28 February 2014 to:

- a) Assess the use of the Bow tie analysis approach in risk evaluation of management options for achieving ecosystem objectives in a spatial management context;
- b) Develop a common understanding and language for evaluating management options in MSP;
- c) Define needs for education and training of experts in applying the methods used in the workshop.

The need for the Workshop has arisen through the increasing importance of marine spatial planning throughout the ICES area, and more widely. In particular OSPAR and HELCOM are encouraged to contribute to the workshop.

The working group has seen that there is a desire for developing a common language and understanding on cumulative impacts assessment (CIA), both on strategic and project level. This comes from the need to take account of trans-boundary impacts when developing and implementing national initiatives, and the need for exchange of information and discussion of management options.

The Bow tie approach is established in the ISO 31000 Risk Assessment standards to assist with risk evaluation and the evaluation of management options within a multi-driver context. The approach encompasses the pressures of multiple drivers leading to a given environmental effect with the intention of identifying opportunities and gaps in existing management measures. Given that the Bow tie is an ISO standard used by major industries, it also provides the basis to create a common language in CIA.

In the workshop, the applicability of the Bow tie approach to environmental risk assessment and the development of spatial management strategies will be assessed in a European trans-boundary context. Scientists from different disciplines and managers involved in MSP activities will be brought together to analyse this approach in relation to selected cases and to develop a common understanding on the applicability in MSP.

WKRASM will report by 7 April 2014 in collaboration with WGMPCZM (via SSGHIE) for the attention of SCICOM. Further output from the workshop in the form of a Cooperative Research Report will be developed together with WGMPCZM.

Supporting Information

Priority	The WKRASM is a direct outcome of the work in WGMPCZM in 2013 and the workshop on Quality Assurance in MSP (WKQAMSP) in 2012. The WK will further the scientific knowledge base for MSP and complement other activities in WGMPCZM.
Scientific justification	Bow tie analysis (ISO 31010:2009) Overview. Bow tie analysis is a simple diagrammatic way of describing and analysing the pathways of a risk from causes to consequences. However the focus of the Bow tie is on the barriers between the causes and the risk, and the risk and consequences. Bow tie diagrams can be constructed starting from fault and event trees, but are more often drawn

directly from a brainstorming session.

Use. Bow tie analysis is used to display a risk showing a range of possible causes and consequences. It is used when the situation does not warrant the complexity of a full fault tree analysis or when the focus is more on ensuring that there is a barrier or control for each failure pathway. It is useful where there are clear independent pathways leading to failure.

Input. An understanding is required of information on the causes and consequences of a risk and the barriers and controls which may prevent, mitigate or stimulate it.

Some level of quantification of a Bow tie diagram may be possible where pathways are independent, the probability of a particular consequence or outcome is known and a figure can be estimated for the effectiveness of a control. However, in many situations, pathways and barriers are not independent and controls may be procedural and hence the effectiveness unclear.

Output. The output is a simple diagram showing main risk pathways and the barriers in place to prevent or mitigate the undesired consequences or stimulate and promote desired consequences.

Resource requirements	None
Participants	We expect between 10 – 15 participants from different disciplines and working backgrounds (including practitioners, natural and social scientists)
Secretariat facilities	Setting up and managing the sharepoint site and registration page.
Financial	None
Linkages to advisory committees	Development of the science base for MSP in ICES is directly relevant to ACOM and several ACOM EGs and initiatives, as it is for SCICOM EGs and initiatives.
Linkages to other committees or groups	directly relevant to WGMPCZM
Linkages to other organizations	OSPAR, HELCOM, EU (DG MARE, DG Environment). In addition the outcomes are relevant to other national organizations and international organizations working with the development of MSP (e.g.. DFO in Canada).
