Communication and Perception of the Human-Ocean Relationship

Deliverable 3.1

Framework for the assessment of the existing knowledge system of ocean literacy

WP3

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Content

Introduction: Communication on the Human-Ocean Relationship

Today's problems in the field of marine environment represent a societal challenge that cannot be solved through technical innovations for combating existing pressures, substituting negative economic practices, and corresponding legal responses alone. As the sources of environmental impacts are highly diverse and often small and widespread, like micro-plastics from cosmetic products, the current situation also calls for a behavioural change in individual, social and professional areas of life.

Already in the past decades this challenge was met by a large number of communication initiatives aiming to raise awareness and to increase the understanding of the people of Europe and the world. Today, this general trend has not diminished, it even increased. But massive changes in the field of communication through rapid developments of the Internet and mobile devices lead to a spread of communications practices, and to a shift towards new modes of expression. Where unidirectional communication predominated, messages from individuals or groups were addressed to a large crowd, there is now also a multidirectional communication of many to many via a multitude of communication channels. By this, conventional forms of information distribution have been supplemented with new forms of opinion dissemination, mutual sympathy, and identification with opinion groups. Although these forms of exchange have often been put aside as being not informative in a conventional sense, it cannot be ignored that they impact opinion-forming processes. And, with that, they may be key in influencing behaviour change.

Despite these general developments in mass communication, activities aiming at an increase of ocean literacy still rely heavily on conventional forms of unidirectional communication to increase understanding of their target groups, even if disseminated through new media. The traditional concept of ocean literacy itself is an expression of this approach, defining it as **an understanding of the oceans influence on people and their influence on the ocean**. In the frame of ResponSEAble, the concept of ocean literacy also has to account for attitudinal conditions that allow for a behaviour change based on an increased understanding.

ResponSEAble seeks to move forward towards an increase of knowledge on the human-ocean relationship accompanied with a support of behaviour changing attitudes. It therefore aims at innovative approaches to communicate knowledge in appropriate channels, and in a way that allows its target groups to assign it to their own areas of influence, be they individual, social, or professional. ResponSEAble also aims at creating information that can be used to support people to strengthen their groups by sharing it on social media platforms and trigger an exchange of opinion and information.

ResponSEAble's WP1, WP2 and WP3 form a work-complex. The task of WP1 is to specify environmental key stories of high concern in the target regions, to collect existing knowledge on them, and to structure it according to an adapted DPSIR framework. Through WP2 the structured knowledge is supplemented with information on the value chain of economic sectors causing these environmental problems. By this, both work packages replicate the entire causality of each key story, which in turn are grouped into a common electronic knowledge base. On the basis of the identified causalities WP3 will systematically gather examples of mediated communication on these key stories from the target regions, quantitatively assess their content compared to the key story causality, and analyse the perception of those target groups that are most relevant as agents of change for each story.

In detail WP3 will assess and describe the existing structure of communication and information mechanisms that are in use today. This assessment includes the development of a classification system of media genres that covers all relevant and accessible media genres for communication and sharing of content on the human-ocean relationship (see 'Classification of Media Genres', page 6). This classification system will be the basis for a systematic collection of media examples. It also provides content units and categories in accordance with findings from WP1 and WP2. These categories will provide means for the analysis of contents that are communicated and shared in different media channels. Furthermore, WP3 will analyse the perception of key storylines identified by WP1 by the target groups identified by WP2 (see 'Effect Analysis', page 19).

As shown above, WP3 is inextricably linked to the progress of WP1, and WP2 in terms of the overall causality of the key stories, as well as the relevant target groups for media and communication. Therefore, progress delays in both work packages inevitably lead to delays in the progress of WP3. As the development of the classification system was independent of the identification of key stories, it was developed and finalized without any delays. For the application of the classification system on the other side is was necessary to have identified key stories, and a running knowledge base. Since there have been delays in both tasks WP3 has actively and proactively assisted these tasks.

Since the effect analysis is not only dependent on the selection of key stories, the application of the classification system on existing media examples, and a running knowledge base, but also on the identification of the most relevant target groups, only a general, although comprehensive, background research was carried out. This general framework, included in this report, will be applied on the concrete situation that will be identified by WP1 and WP2, as well as by the results from the application of the classification system for media genres. General working steps for this task are included in this report, and will be updated in the coming months.

Classification System

In order to systematically collect and analyse mediated communications on the environmental key stories identified by WP1 and supplemented by WP2, a classification system was developed. For this, changes in the communicative habits and practices have been taken into account. The development of the classification system is based on findings from the area of media studies. This chapter outlines the general approach and presents the results from our work.

Classification of Media Genres

Considering that there is nothing as practical as a good theory, to quote Kurt Lewin (1945), we reviewed and analysed several frameworks for the classification task ahead, also having in mind another possible practical application of such framework in WP6, which is concerned with the dissemination of the project results.

Media Genres as Social Action

We revisited Carolyn R. Miller's text "Genre as social action" (1984), that was mentioned in the original workplan of WP3 and in which the author argues that a "sound definition of genre must be centred not on the substance or the form of discourse" but rather "on the action it is used to accomplish". This pragmatist perspective on genre tries to go beyond the limitations of other classification schemes, based on rhetorical substance (semantics) and form (syntactics). Miller's socio-contextual approach also has the advantage of considering as genres the "trivial" everyday life discourses, such as the letter of recommendation, the user manual, the progress report, even the ransom note, noting that this "is not to trivialize the study of genres; it is to take seriously the rhetoric in which we are immersed and the situations in which we find ourselves" (1984: 155). The understanding of media as a social action, while relevant, does not provide the necessary framework for the classification of genres. Also, this article was written in 1984, well before the impact of digital media could be broadly seen in all the walks of life.

Six Dimensions of Communicative Interaction

The work of Yates & Orlikowski (2002) on genre systems and their application to organizational communications gives important insight to the present task. In particular, these authors identified genres by their socially recognized purpose and, also, by their common characteristics of form. In the first case, it should be noted that the purpose of a genre is "socially constructed and recognized by the relevant organizational community for typical situations (e.g., proposing a project, meeting to review project status)", rather than the individual's private motive for communicating. Yates & Orlikowski (2002) also propose that genre systems are a means of structuring six dimensions of

communicative interaction, namely:

1. form (how)	2. participants (who/m)	3. place (where)	4. time (when)	5. purpose (why)	6. content (what)

How - Forms of Media

With digitalization, the very concept of genre" is in doubt" states Klaus Bruhn Jensen (2011), questioning what a genre is - the World Wide Web, Facebook, or the writing on its walls? For Jensen, genres occupy a middle ground of media studies, further explaining that genres are between media as technologies and institutions, and also, that genres are between discourses as material and modal forms of expression and interaction. This author proposes a framework for studying **communicative practices** across media of three different degrees – see also Table 1 (Jensen, 2010):

- media of the first degree, one-to-one: the human body enabling communication face-to-face;
- media of the second degree, one-to-many: the technically reproduced means of analogue mass communication;
- media of the third degree, many-to-many: and the digital technologies facilitating networked interaction one-to-one, one-to-many, as well as many-to-many.

It should be noted that the classification of media genres is not always a straightforward task, since the same media genre can be classified in a different way, depending on who is the author(s) or to whom it is addressed. For instance, a book can be one-to-many or many-to-many, as well as a manuscript.

Jensen (2010) observes that the traditional categories in the communication field (e.g. as mass communication, interpersonal communication, mediated and unmediated communication) may not be the most adequate to properly understand the current media convergence environment. This researcher outlines an approach that seeks to avoid these divides, namely the offline and online divide: "Occasionally implying a dichotomy of technologically mediated *versus* 'non-mediated' face-to-face communication, the field of communication research has tended to produce separated bodies of mass and interpersonal communication studies". Therefore, Jensen aims to shift the focus from media towards communication, emphasizing the recombination and reconfiguration of one-to-one, one-to-many and many-to-many communication - further explained in Table 2.

Table 1: Jensen (2010) Media of three degrees – Materials, Meanings, Institutions

	Materials	**Meanings**	**Institutions**
Media of the first degree	Human bodies, artistic and writing utensils; musical instruments; etc.	Speech; writing; song; musical performance; dance; drama; painting; etc.	Local and regional organizations, replying on oral, scribal, and hybrid forms of interaction.
Media of the second degree	Analogue information and communication technologies: printing, photography, telegraphy, telephony, film, radio, television, etc.	Technically reproduced, enhanced, and separated forms of representation and interaction.	Local, national, regional, and transnational organizations, replying on print and electronic forms of interaction.
Media of the third degree	Digital information and communication technologies: standalone and networked computers; intranets; internet; mobile; telephony; etc.	Digitally processed, enhanced, separated and simulated forms of representation and interaction.	Local, national, regional, transnational and global organizations, replying on networked forms of interaction.

For the classification of the forms of media genres, this categorization is of great interest, since it allow us to encompass the many diverse communicative practices related with ocean literacy, might they be face-to-face or mediated, analogue or digital, just to name a few traditional divides in this field.

Table 2: Jensen (2010) Media types / Communicative practices

Media Types	**One-to-one**	**One-to-many**	**Many-to-many**
Media of the first degree	PROTOTYPE Face-to-face conversation, hand-written letter	Theatre, painting, sculpture, architecture, musical composition	Cave painting, gaming, graffiti, notice board, agora, marketplace, stadium
Media of the second degree	Telegraph, telephone, fax	PROTOTYPE Book, newspaper, magazine, broadcasting audio and video recording	Community media, public-access radio and television, telephone chat services
Media of the third degree	Email, text message, instant messaging, IP telephony	Web 1.0/ webpage, streaming (mass) media	PROTOTYPE Web 2.0/ wiki, file sharing site, online chat, massively multiplayer online gaming, social network site, blog

Again reflecting the need to go beyond the traditional categories in the communication field, Stine Lomborg (2011) proposes that social media should also be considered as communicative genres, a particular kind of dynamic genre, with shifting roles of producers and recipients and with a participatory and informal character. In our view, this important view is inherent in the classification of communicative practices as outlined above, namely within the communicative practice of many-to-many via media of the third degree.

Who – Participants of Communication

Within our classification system the audience can be considered in multiple dimensions. For instance, a clean-up beach campaign has at least two audiences: a. those that participate (direct effect of a campaign) and b. those that read the leaflet/ outcomes of the campaign (indirect receivers). The classification system should allow for this differentiation and more profound analysis. Similarly, regarding "who", the classification system should allow for the distinction between a. creator (the source of the information) and b. publisher (the disseminator of information).

Where – Geographical Origin and Focus

When analysing "where", the classification could differentiate between a. where it is done (e.g. filmed somewhere) and b. where is played/ disseminated (objective). This differentiation will also be reflected in the classification system.

When – Year of Origin and Recreated Context

The "time" can also refer to two different timings: a. time (year) of production of the media genre, and b. time as referring to the time context recreated by the genre (e.g. documentary on a past event or representation of future climate change scenarios).

Why – Functions or Purpose of Media

McQuail (2010) consider the terms **function** and **purpose** as synonyms, observing the following: "correspondence between function (or purpose) and precise content of media is not exact, since one function overlaps with another, and the same content can serve different functions" (McQuail, 2010: 99). So, the author proposes these **five media tasks (functions)** in society:

1. **Information -** "providing information about events and conditions in society and the world; indicating relations of power; facilitating innovation, adaptation and progress";
2. **Correlation** - "explaining, interpreting and commenting on the meaning of events and information; providing support for established authority and norms; socializing; co-ordinating separate activities; consensus building; setting orders of priority and signaling relative status";
3. **Continuity** - "expressing the dominant culture and recognizing subcultures and new cultural developments; forging and maintaining commonality of values";
4. **Entertainment -** "providing amusement, diversion and the means of relaxation; reducing social tension";
5. **Mobilization** - "campaigning for societal objectives in the sphere of politics, war, economic development, work and sometimes religion" (McQuail, 2010: 98-99).

As this list of purposes relates to societal functions of media it is useful for our objective to classify media genres as social actions in WP3. It is made clear that these functions can overlap, so for our objectives, it is sufficient to allow for several purposes to be included for each media record.
The list touches societal functions of communication on a very general level. For example, information might include news telling, as well as education in schools. For the purpose of classifying communications to support ocean literacy these are distinguished purposes. Also, awareness raising might be subordinated to mobilization, but it is still a step away from calling for action. Therefore, we refined these 5 societal functions of communication in the following way to meet our own needs:

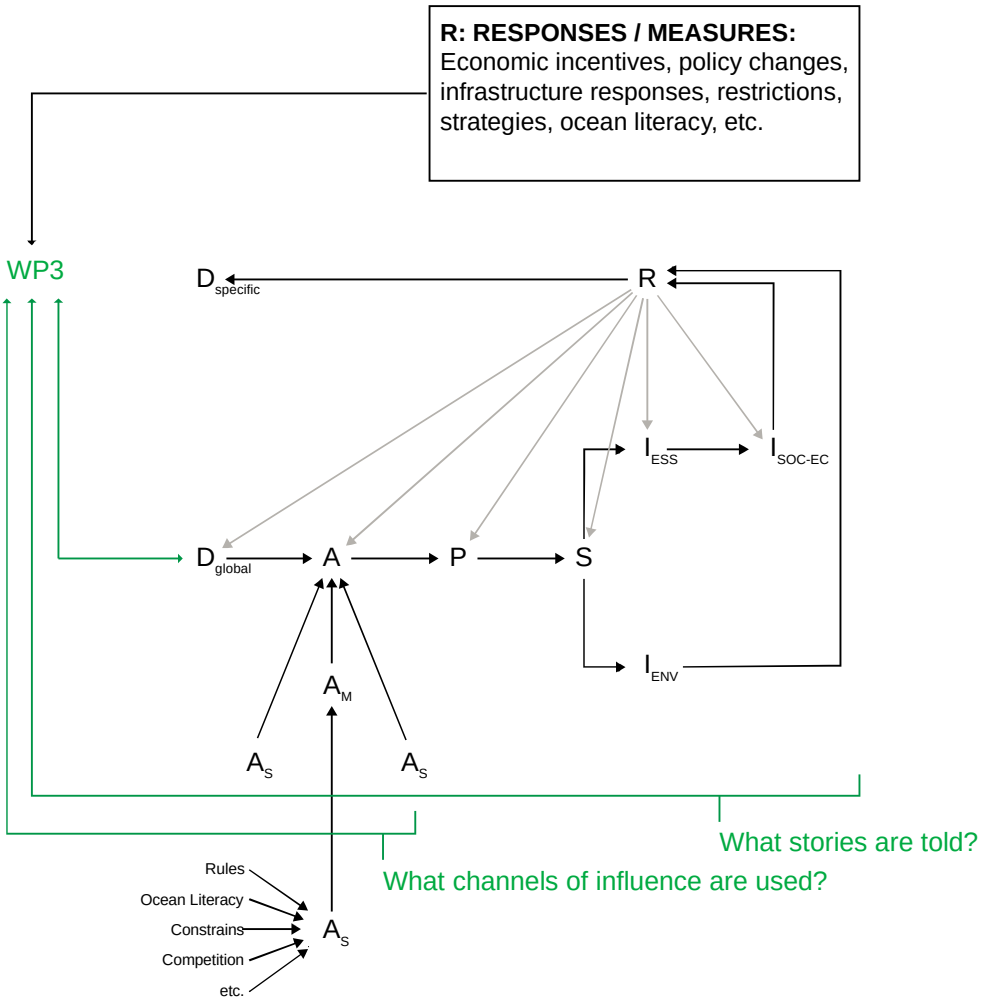
Table 3: Classification of communicative purposes

Function	**Classification**
Information	To educate
	To inform
Correlation	To advance knowledge
	To explain
	To interpret
	To comment
	To provide support
	To build consensus
Continuity	To forge common values
	To maintain common values
Entertainment	To entertain
Mobilization	To raise awareness
	To call to action

What – Content of Media

The general objective of ResponSEAble is to support the projects target groups to become ocean literates or to increase their ocean literacy level. To this end, the project aims to identify existing knowledge, and to produce material that not only strengthens the understanding of the oceans influence on people, and their influence on the ocean, but also support behaviour changes by taken attitudinal factors into account. Structuring existing knowledge along the DPSIR framework is a first step towards this goal, as it allows for developing a system-based approach expressing key relationships between society and the environment (see deliverable D1.1).

After WP1 has finalized the collection of existing knowledge on the key stories, WP3 will gather media cases for the Knowledge Base as "supporting" stories or "evidence" for the selected key stories. Subsequently these cases will be analysed in terms of their content qualitatively and quantitatively, including the concepts of the adapted DPSIR framework that are mentioned by the cases and their frequency over all collected cases. Hence, the content needs to be systematically described using the adapted DPSIR framework.



From many existing "DPSIR" derivations (Smith et al. 2014), in WP1 the DAPSI(W)R approach (Elliott 2014) was selected and adapted to the needs of ResponSEAble. Within this framework, Drivers are considered as the main social, demographic, economic and cultural developments in society. These driving forces power economic activities to respond to the needs of the population. Activities in turn may cause multiple environmental pressures, potentially leading to changes in the environmental state. State changes may result in impacts on the environment as well as human Welfare. Finally, environmental impacts call for responses from the human society. Responses can tackle either part of the DAPSI(W)R chain (modified from Elliott 2014 with inputs from Patricio et al. 2014, DG

Environment 2014, and ResponSEAble project). For more information on the adapted DAPSI(W)R framework see deliverable D1.1.

As WP1, 2, and 3 are deeply connected regarding the common Knowledge Base, a common solution to describe the content of media in WP3, the key stories of WP1, and the value chain in WP2 was derived from existing classifications, e.g. the NACE classification system of economic activities. All information will be placed within the Knowledge Base using these terms in order to be properly interconnected. The following table summarizes the sources that were consulted to build classification systems for the description of content along the DAPSI(W)R. The complete classifications can be found in Annex 1.

Concept	Sources and adaptions
Drivers	Classification of drivers of ecosystem change. (Nelson et al., 2006).
Activities	Aggregated classification of economic activities. (2008) (NACE Rev. 2).
Pressures	Classification of pressures from the EU Marine Strategy Framework Directive (MSFD, 2008/56/EC).
State	Indicative lists of characteristics of the environmental state from the EU Marine Strategy Framework Directive (MSFD, 2008/56/EC).
Impacts on the Environment	Adaption of medical classification of functioning, disability and health (Dahl, 2002), supplemented with general ecological functions.
Impacts on Ecosystem Services	Reduced classification of Ecosystem Services based on Common International Classification of Ecosystem Services (CICES) developed by the European Environment Agency (EEA)
Responses	Classification of environmental responses by nature of intervention (Chopra et al., 2005)

WP1 will produce a causal map for each of the stories to enable the development of the Knowledge Base. Using the content description classification system outlined above, WP3 will map identified mediated communications on the key story to the causality produced by WP1. Figure 1 presents an example casual map created for microplastics. We produced an overlay of the stories that are formed by different media cases. The figure clearly shows which components of the key story are most often touched by mediated communication. A clear mapping of scientific knowledge and mediated stories will help to analyse the content regarding specific knowledge concepts.

Figure 1: Draft of a causal map for the microplastics key story

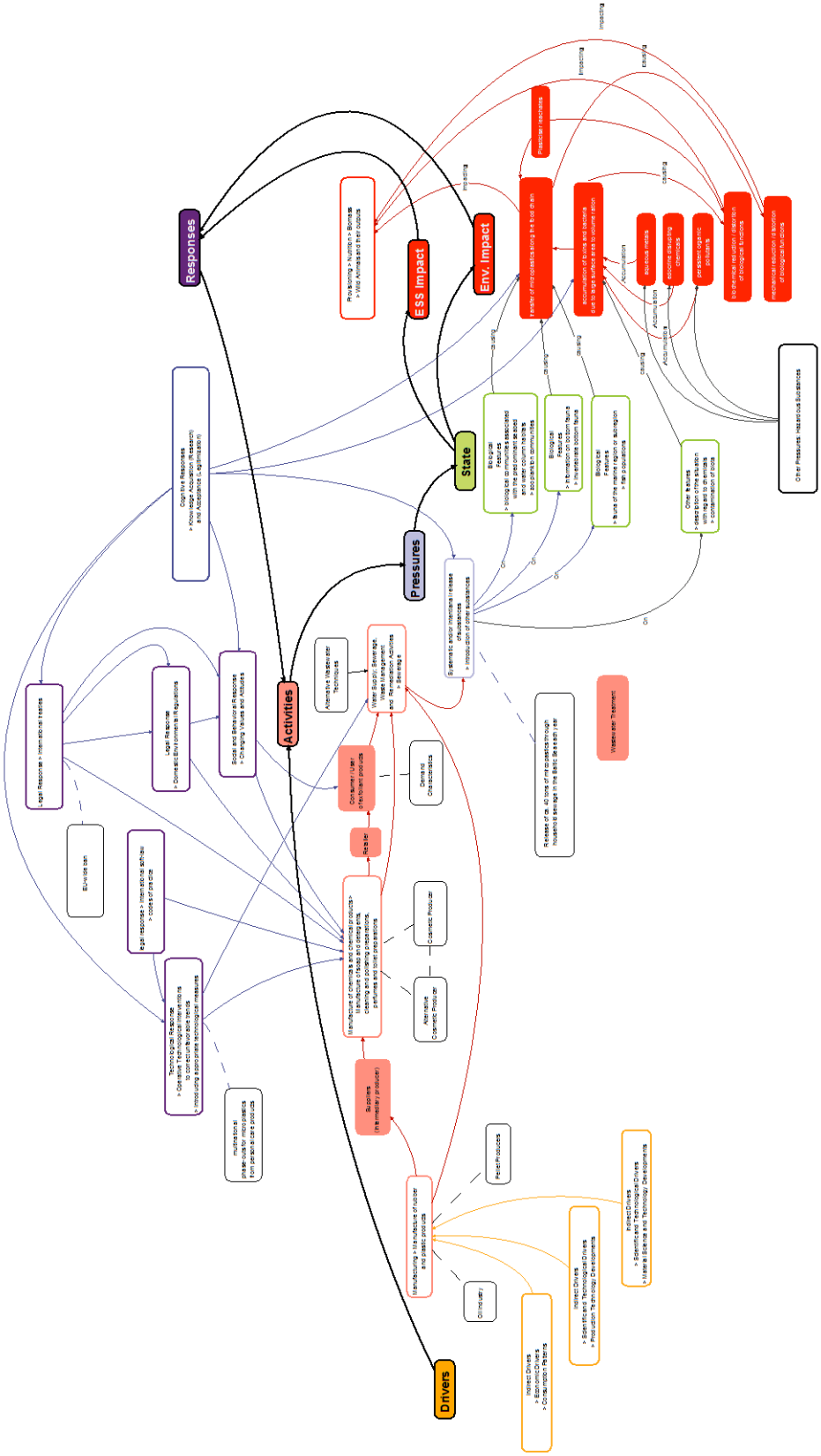
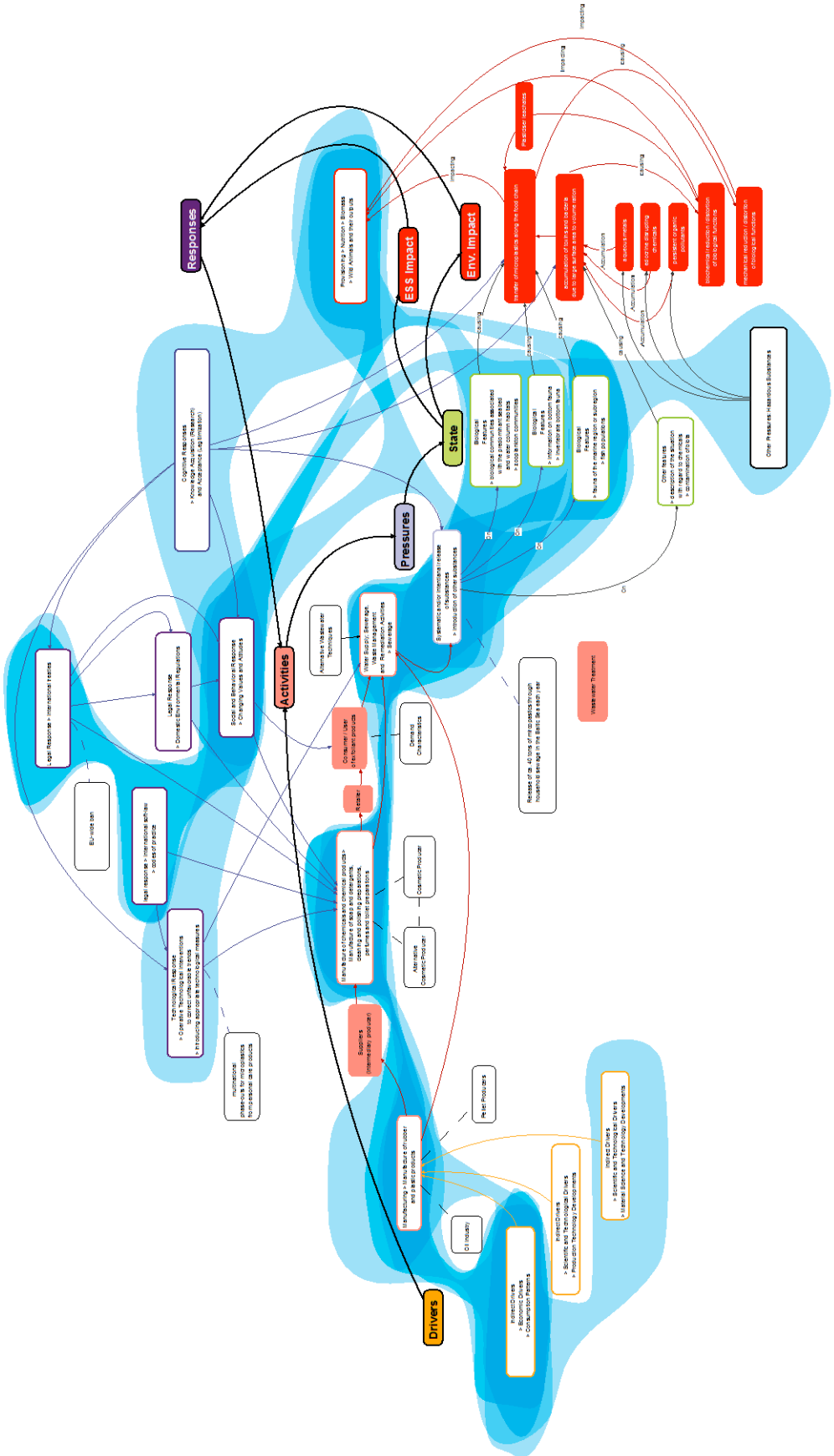


Figure 2: Causal map for the microplastics key story with superimposed media stories



Additional Metadata

In addition to the six categories for classification of the functions of the communication, additional categories of metadata have been compiled. Using this metadata, collected media cases can be unequivocally assigned to the Knowledge Base and subsequently evaluated. The following table summarizes these categories for additional metadata and the functions of communication. It therefore represents the complete classification system for media that will be used in the further progress of ResponSEAble to classify information identified by WP1, WP2, and WP3 in order to enter this information into the Knowledge Base.

Area of Interest	Descriptor	Definition
General Information	Title	Original title of the media case
	English title	English translation of the title
	Resource	Online resource if available
	Level of access	Is the resource publicly accessible?
	Language	Language(s) of the resource
How	Media type	See ANNEX 2: Media Type Classification
	Media degree	First, second, or third degree
	Communicative practice	One-to-one, one-to-many, many-to-many
Why	Communication purpose	See Table 3: Classification of communicative purposes (page 11)
Who	Target audience	Target audience of the media case
	Author	Author of the media case
	Publisher	Publishing body of the media case
	Organisational sector of publishing organisation	Public, private, non-profit
	Type of organisation	**Public:** Public Education Institution, Public Research Institution, Public Research and Education Institution, Public Broadcaster, Governmental Institution. **Private:** Newspaper, Journal, Magazine, private broadcaster. **Non-profit**: International Foundation, International NGO, National Foundation, National NGO.

Area of Interest	Descriptor	Definition
When	Year of publication	Year of publication
	Time reference in the content	Reference to year or period
Where	Country of origin	Country of origin of the media case
	Geographical focus of the content	Geographical reference in the content: Global, Europe, Atlantic, Baltic Sea, Black Sea, Mediterranean Sea, North Sea
What	Content related to drivers	See Annex 1.1: Classification of Drivers
	Content related to activities	See Annex 1.2: Classification of economic activities
	Content related to pressures	See Annex 1.3: Classification of pressures
	Content related to state	See Annex 1.4: Indicative lists of characteristics of the environmental state
	Content related to environmental impacts	See Annex 1.5: Classification of environmental impacts
	Content related to ecosystem service impacts	See Annex 1.6: Classification of Ecosystem service impacts
	Content related to responses	See Annex 1.7: Classification of environmental responses by nature of intervention
	Short synthesis of the knowledge	Short synthesis of the content in English (500 characters)
Dissemination	Number of hits	Hits of Website, Videostream
	Number of likes	Likes for social media content
	Impact factor	Impact factor of scientific paper
	Number of persons	Number of participants at any kind of gatherings
	Number of retrievals	Number of downloads for any kind of downloadable content
Entry Data	Person who entered the information to the knowledge base	Name and organisation of the person who entered the information
	Date of entry	Date of information entry

Effect Analysis

ResponSEAble aims at supporting the emergence of an effective and dynamic ocean knowledge system that contributes to raising awareness on everybody's (individual and collective, direct and indirect) responsibility and interest in a healthy and sustainable ocean. From the viewpoint of ResponSEAble an ocean literate person has the capacity and willingness to act appropriately as well as individually and socially responsible in professional, social and private situations that impact the marine environment.

Knowledge, Attitude and Behaviour

Knowledge is often associated with pro-environmental behaviour (Zelezny, 1999). However, in general, the relationship between knowledge and behaviour change tends to be weak (Fishbein & Ajzen, 1975). Changing behaviour requires more than just knowledge. According to Jacobs & Harms (2014) the factors values, attitudes, norms, awareness of consequences, feelings of responsibility, affect and emotion also influence an individual's behaviour. Several of these factors are open to manipulation, where others aren't. These factors will be briefly discussed in the chapter 'other factors influencing behaviour'.

Lots of information on the human-ocean relation is being produced and disseminated, with different objectives, to different target groups using different media genres, as WP3 is charting using the developed classification system. ResponSEAble focuses on the development of knowledge and information disseminated via appropriate media genres and structured in a way that provides starting points for a subjective understanding of one's own connection to the sea, to one's capacity to act, and to one's own responsibility, may it be directly or mediated by society. Beyond understanding, ResponSEAble also aims to trigger behaviour change.

Information and the way it is transferred can influence people's perceptions of the human-ocean relationship, it can lead to an increase of personal responsibility towards the ocean, and it can ultimately drive behaviour change leading to more sustainable use of the ocean.

However, knowledge does not necessarily produce an attitude for responsible behaviour. The correlation between the two concepts has been at the centre of a discussion of research on the public understanding of science, and strongly connected to the 'deficit model' (Irwin and Wynne, 1996; Sturgis and Allum, 2001). This model explains resistance to science and technology by ignorance, superstition and fear. Following this, resistance to scientific knowledge would be reduced if people would better understand the principles and approaches of science. Various studies have analyzed the relation between attitudes and knowledge with different outcomes. Many researchers identified a weak correlation between knowledge and generalized attitudes towards science (Bauer et al., 1994; Grimston, 1994; McBeth and Oakes, 1996; Miller et al., 1997; Sturgis and Allum, 2000, 2001). Regarding the attitudes towards specific technologies this link is often weaker or even negative (Evans and Durant, 1995).

Also, socioeconomic conditions were identified as factors for the strength of the correlations between public attitudes and knowledge (Allum et al., 2002; Bauer et al., 1994; Durant et al., 2000). In industrial societies science is seen as a promise of economic expansion and social emancipation, whereas in post-industrial societies knowledge becomes more specialized and the public develops more skeptical and questioning views (Inglehart, 1990). The latter can also be related to the much larger information environment that individuals have at their disposal through, for instance, social media and the internet in general. These differences how science is viewed between countries can be eliminated by the inclusion of tertiary education (universities, cooperative education, vocational schools) and the number of internet connections (Allum et al., 2011). In an economically diverse Europe, these factors have to be included for the development of ocean literacy based on existing scientific knowledge, be they industrial development stages, tertiary education access or internet connections. As the human-ocean relationship is very often spelled out in specific uses and scientific understandings, the question of ocean literacy cannot be based on the attitudes to a general understanding of science.

In order to produce effective information that triggers behaviour change in favour of the state of the marine environment, one needs to understand how people perceive the oceans and more importantly specific features of the human-ocean relationship, and what aspects of communication trigger perceptions and behaviour change.

This chapter focuses on perceptions and describes (1) how perceptions are shaped by information and other factors and how these in turn affect behaviour, and (2) how WP3 can study information environments, perceptions and other factors influencing behaviour change.

How information influences perceptions

Perceptions are shaped by many aspects such as information (from different media genres), personal and group-related interests, culture and religious beliefs, experience, education, etc. (see Figure 1).

'Perception' refers to the outcome of applying our knowledge to a particular situation (Leeuwis 2004) and/or new information. Knowledge is the basic means through which we understand and give meaning to the world around us. Knowledge can also be understood as a collection of 'interconnected schemes of interpretation' that we have available in our heads, and that we can mobilise to give meaning to a particular situation (Leeuwis 2004), and/or information.

Knowledge and perception are closely intertwined with the concept of 'information' (Leeuwis 2004). With the help of information, knowledge and perception, humans reduce uncertainty and bring order to the world around them (Ibid). `Information´ can be seen as knowledge expressed in a tangible form (Ibid).

Individuals are confronted with information in their 'information environment'. This can be seen as a very literal environment, as a physical surrounding, for instance the boat of a fisherman or the office of a policy maker. Here, experiences, colleagues, screen displays, charts, documents, etc., constitute the full array of information sources (Verweij et al. 2010).

The information environment overlaps and interacts with a person's frame, or current belief system and value sets.

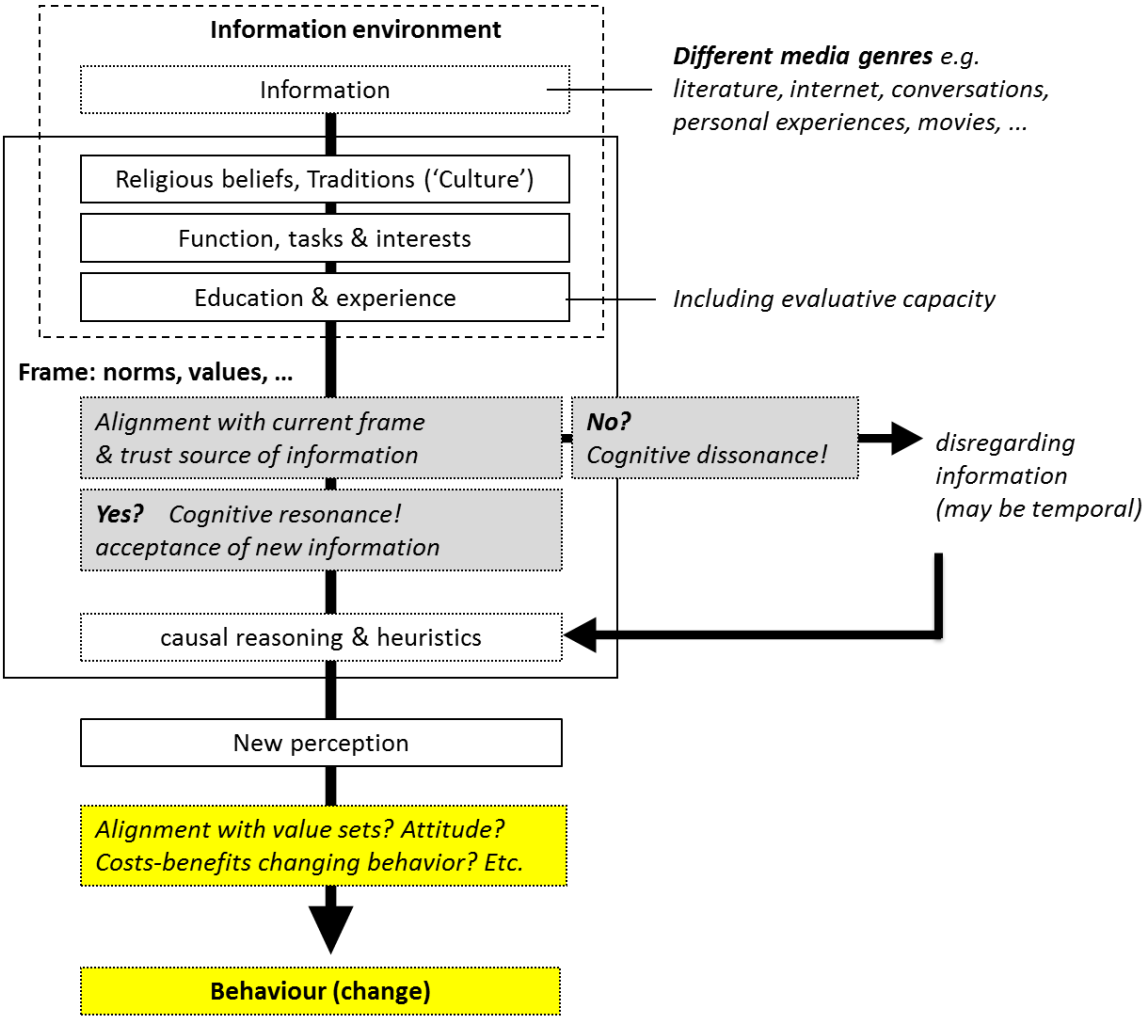


Figure 3: How information influences perceptions and behaviour change (after Verweij et al. 2010, Leeuwis 2004, Steckelberg et al. 2004).

New information will be captured and processed if this information fits into the current frame of beliefs and values, a process of 'cognitive resonance'. Such accommodated information will then shape (existing) perceptions. However, if information contradicts one's belief systems, this gives rise to feelings of tension; a process called 'cognitive dissonance' (Festinger 1957, Frey 1982). Cognitive dissonance can be reduced by minimizing, devaluing or even by completely disregarding this information (Steckelberg et al. 2004). Information can also be disregarded if the source of the information is not trusted. This does not mean that

this information is disregarded completely and forever. It may still 'stick in the back of someone's mind' and change the perception in due course, for instance when presented with the same type of information over and over again.

Reasoning the other way around, the same information that has been available throughout, and for a long time (e.g. the IPPC's notion that the climate is changing and that human activities are the main cause), can suddenly reach a whole new group of people, and influence their perception (and possibly even behaviour), once it is being transmitted by a different sender (e.g. the 'green encyclical' of the Pope in 2015 ventilated a similar message about climate change). So whether the source of information is perceived as trustworthy is an important determinant to whether information is 'consumed' or actually integrated (leading to new knowledge).

The way information is captured and processed is also a result of education and life experience, leading to knowledge. Knowledge, as put by Alter (1995), is needed to use information effectively. So, even when confronted with the same type of information, individual differences in processing and evaluation of this information can still cause perception differences. This can partly be explained by people having different capacities to handle certain formats (e.g. text, table, graph, or drawing) of information.

Also, interests influence the capturing and processing of information (Leeuwis 2004). Hommes et al. (2009) describe how information is sometimes captured selectively and used or rejected depending on the interests at stake.

Finally, how we perceive the world, or more specifically, human-ocean interactions, can lead to a sense of urgency and personal responsibility, which in turn influences our behaviour. However, note that perceptions, being aware, and being 'ocean literate', do not necessarily lead to behaviour change! Attitudes, societal trends, perceived behavioural control etc. may determine how far information perception translates into behavioural change. This is especially something that WP5 should keep in mind, because they will develop the 'educational tools' that will increase ocean literacy and stimulate behaviour change.

Other factors influencing behaviour

Besides information and knowledge, other factors that affect behaviour include (plus definitions):

Values are desirable trans-situational goals varying in importance, which serve as guiding principles in the life of a person or other social entity (Rockeach, 1973; Schwartz, 2006). They are formed early in life, and tend to be resistant to change (Jacobs, Vaske, Teel, & Manfredo, 2012).

Attitudes are mental dispositions to respond favorably or unfavorably to an object or event with some degree (Ajzen, 2005). An attitude toward an object is determined by salient beliefs about that object

(Fishbein & Ajzen, 1975). As knowledge might influence these beliefs, new knowledge might influence attitudes (Cottrell & Graefe, 1997; Madden, Ellen, & Ajzen, 1992), and, in turn, behaviour.

Norms are feelings of moral obligation to perform or refrain from specific actions. They result in pro-social actions (The Norm Activation Model: Schwartz & Howard, 1981). Personal norms are activated when someone is aware that one's actions have consequences for others or the environment ('awareness of consequences') and when someone feels responsible for these consequences ('feelings of responsibility'). Similar to values, manipulating norms would be problematic: changing someone's norms is hard to achieve. Yet, manipulating awareness of consequences and feelings of responsibility in order to activate someone's pre-existing norms is more likely to be successful (Schwartz & Howard, 1981).

Affect refers to the general class of feeling states experienced by humans, and covers the concepts of mood and emotions (Manfredo, 2008). It was found to predict environmental attitudes (Pooley & O'Connor, 2000)

Emotions are about a specific event, have short duration, and usually involve conscious thought (Manfredo, 2008). They are hypothesized to drive our attraction to wildlife (Manfredo, 2008) and our motivation to view wildlife (Jacobs, 2009). They were found to inform decisions about wildlife-related behaviours (Slagle, Bruskotter, & Wilson, 2012; Wilson, 2008).

Studying perceptions: Working Steps

ResponSEAble aims at influencing people's perceptions and behaviour through information and improved ocean literacy. Therefore, it is relevant to study the current perception that main stakeholders (indicated by WP2) have of the human-ocean relationship in general, and of the key stories selected by WP1 in specific.

Besides studying the perception (the outcome of an evaluative process), we should also examine the information environments (consisting of, for instance, different media genres), value sets and critical enablers/barriers with regards to behaviour change.

For the analysis of the perception of our target groups, we will follow these working steps:

- Step 1: qualitative semi-structured (in-depth) interviews, vis-a-vis
  This step gives input for steps 2 and 3:
- Step 2: quantitative, general (online) surveys to target broader audience
- Step 3: qualitative focus groups on specific key stories in respective regions

As a trial, a semi-structured interview has been drafted for the case study 'microplastics' / stakeholder group 'cosmetics producer'. **Please note that this is work in progress**! Possible questions include:

- Name, age
- Function, tasks of interviewee
- Education (background and in-company)
- What are your pains and gains in your job? *(Personal value sets and barriers / enablers)*
- What is the mission of your company? *(note to interviewer: company value sets)*
- How does this work in practice? *(concrete examples)*
- How is this related to your policy on microplastics?
- What is the function of plastic in your products?
- What is your idea about the current state of the oceans?
- Why is plastic a problem, do you think? *(in general, not link to ocean yet)*
- *(if impact on oceans is not mentioned)* What is the effect of microplastics on the oceans?
- How do you know this? Through which information channels / media genres / personal experiences?
- Has your company / have you adapted to specific pieces of law, societal pressures, certain information, to minimize the impacts of your products?

Conclusions

Through the effort undertaken in WP3 a framework was developed to gather and analyse the knowledge system on the human-ocean relationship in terms of media genres, media content, as well as target group perceptions. The workpackage has laid the floor for a systematic and extensive assessment of the status of ocean literacy in Europe taken into account regional particularities and similarities. It also supported and shaped the developments of WP1 and WP2.

From here, a common effort of project consortium should be made to fill the existing framework in the coming months. We are confident that WP1, 2, and 3 have prepared the ground for a fruitful application of the developed principles. We hope that this report serves to place the focus of the project team firmly on the next steps towards our common goal.

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ANNEX 1: Content Classification

Annex 1.1 Classification of drivers of ecosystem change

(Nelson et al., 2006. Anthropogenic drivers of ecosystem change: an overview. Ecology and Society 11(2): 29.[1])

I. Indirect drivers
    1. Demographic Drivers
        A. Population Variability
        B. Age Distribution
        C. Migration
    2. Economic Drivers
        A. Consumption Patterns
        B. Economic Structure
        C. Economic Distribution
        D. Economic Growth and Development
        E. Economic Productivity
        F. Energy Availability
        G. Material Availability
    3. Sociopolitical Drivers
        A. Societal Interactions
        B. Well-Being
    4. Cultural and Religious Drivers
    5. Scientific and Technological Drivers
        A. Agricultural Science and Technology Developments
        B. Marine Science and Technology Developments
        C. Production Technology Developments
        D. Pharmaceutical Science and Technology and Chemistry Developments
        E. Material Science and Technology Developments

II. Direct Drivers
    1. Greenhouse Gas Emissions
    2. Air Pollution Emissions
    3. Climate Variability and Change
    4. Sea Level Rise

[1] http://www.ecologyandsociety.org/vol11/iss2/art29/

5. Change in Land Use or Land Cover
6. Application of Nitrogen Fertilizer and Nitrogen Loads to Rivers and Coastal Marine Systems
7. Disruption of Landscape by Mining and Fossil Fuel Extraction
8. Land Conversion
9. Biological Invasions and Diseases

Annex 1.2: Classification of economic activities

(Statistical Classification of Economic Activities in the European Community, Rev. 2 (2008) (NACE Rev. 2))[2]

I. Agriculture, forestry and fishing
    1. Crop and animal production, and related service activities
        A. Growing of non-perennial crops
        B. Growing of perennial crops
        C. Animal production
        D. Support activities to agriculture and post-harvest crop activities
    2. Forestry and logging
        A. Silviculture and other forestry activities
    3. Fishing and aquaculture
        A. Fishing
        B. Aquaculture

II. Mining and quarrying
    1. Mining and quarrying
        A. Mining of coal and lignite
        B. Extraction of crude petroleum and natural gas
        C. Mining of metal ores
        D. Other mining and quarrying

III. Manufacturing
    1. Manufacture of food products
        A. Processing and preserving of meat and production of meat products
        B. Processing and preserving of fish, crustaceans and molluscs
        C. Processing and preserving of fruit and vegetables
        D. Manufacture of vegetable and animal oils and fats
        E. Manufacture of dairy products
        F. Manufacture of grain mill products, starches and starch products
        G. Manufacture of bakery and farinaceous products
        H. Manufacture of other food products
        I. Manufacture of prepared animal feeds
    2. Manufacture of beverages

2 http://ec.europa.eu/eurostat/ramon/nomenclatures/index.cfm?TargetUrl=LST_CLS_DLD&StrNom=NACE_REV2&StrLanguageCode=EN&StrLayoutCode=

3. Manufacture of tobacco products
4. Manufacture of textiles
    A. Preparation and spinning of textile fibres
    B. Weaving of textiles
    C. Finishing of textiles
    D. Manufacture of other textiles
5. Manufacture of wearing apparel
6. Manufacture of leather and related products
7. Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
8. Manufacture of paper and paper products
9. Printing and reproduction of recorded media
10. Manufacture of coke and refined petroleum products
11. Manufacture of chemicals and chemical products
    A. Manufacture of basic chemicals, fertilisers and nitrogen compounds, plastics and synthetic rubber in primary forms
    B. Manufacture of pesticides and other agrochemical products
    C. Manufacture of paints, varnishes and similar coatings, printing ink and mastics
    D. Manufacture of soap and detergents, cleaning and polishing preparations, perfumes toilet preparations
    E. Manufacture of other chemical products
    F. Manufacture of man-made fibres
12. Manufacture of basic pharmaceutical products and pharmaceutical preparations
13. Manufacture of rubber and plastic products
14. Manufacture of other non-metallic mineral products
15. Manufacture of basic metals
16. Manufacture of fabricated metal products, except machinery and equipment
17. Manufacture of computer, electronic and optical products
    A. Manufacture of electronic components and boards
    B. Manufacture of computers and peripheral equipment
    C. Manufacture of communication equipment
    D. Manufacture of consumer electronics
    E. Manufacture of instruments and appliances for measuring, testing and navigation; watches and clocks
    F. Manufacture of irradiation, electromedical and electrotherapeutic equipment

G. Manufacture of optical instruments and photographic equipment
H. Manufacture of magnetic and optical media

18. Manufacture of electrical equipment
    A. Manufacture of electric motors, generators, transformers and electricity distribution and control apparatus
    B. Manufacture of batteries and accumulators
    C. Manufacture of wiring and wiring devices
    D. Manufacture of electric lighting equipment
    E. Manufacture of electric lighting equipment
    F. Manufacture of other electrical equipment
19. Manufacture of machinery and equipment n.e.c
20. Manufacture of motor vehicles, trailers and semi-trailers
21. Manufacture of other transport equipment
    A. Building of ships and boats
    B. Manufacture of railway locomotives and rolling stock”
    C. Manufacture of air and spacecraft and related machinery
    D. Manufacture of military fighting vehicles
    E. Manufacture of transport equipment n.e.c.
22. Manufacture of furniture
23. Other manufacturing
    A. Manufacture of jewellery, bijouterie and related articles
    B. Manufacture of musical instruments
    C. Manufacture of sports goods
    D. Manufacture of games and toys
    E. Manufacture of medical and dental instruments and supplies
    F. Manufacturing n.e.c.

IV. Repair and installation of machinery and equipment
    A. Repair of fabricated metal products, machinery and equipment
    B. Installation of industrial machinery and equipment

V. Electricity, gas, steam and air conditioning supply
    A. Electric power generation, transmission and distribution
    B. Manufacture of gas; distribution of gaseous fuels through mains
    C. Steam and air conditioning supply

VI. Water supply; sewerage, waste management and remediation activities
    1. Water collection, treatment and supply

2. Sewerage
3. Waste collection, treatment and disposal activities; materials recovery
    A. Waste collection
    B. Waste treatment and disposal
    C. Materials recovery
4. Remediation activities and other waste management services

VII. Construction
    A. Construction of buildings
    B. Civil engineering
    C. Specialised construction activities

VIII. Transportation and storage
1. Land transport and transport via pipelines
2. Water transport
    A. Sea and coastal passenger water transport
    B. Sea and coastal freight water transport
    C. Inland passenger water transport
    D. Inland freight water transport
3. Air transport
    A. Passenger air transport
    B. Freight air transport and space transport

IX. Accommodation and food service activities
1. Accommodation
    A. Hotels and similar accommodation
    B. Holiday and other short-stay accommodation
    C. Camping grounds, recreational vehicle parks and trailer parks
    D. Other accommodation
2. Food and beverage service activities
    A. Restaurants and mobile food service activities
    B. Event catering and other food service activities
    C. Beverage serving activities

X. Professional, scientific and technical activities
1. Architectural and engineering activities; technical testing and analysis
2. Scientific research and development
3. Veterinary activities

XI. Education

1. Pre-primary education
2. Primary education
3. Secondary education
    A. General secondary education
    B. Technical and vocational secondary education
4. Higher education
5. Other education
    A. Sports and recreation education
    B. Cultural education
    C. Driving school activities
    D. Other education n.e.c.
6. Educational support activities

XII. Arts, entertainment and recreation

1. Creative, arts and entertainment activities
2. Libraries, archives, museums and other cultural activities
3. Gambling and betting activities
4. Sports activities and amusement and recreation activities

Annex 1.3: Classification of pressures from the EU Marine Strategy Framework Directive *(MSFD, 2008/56/EC)*

I. Physical loss
    1. Smothering (e.g. by man-made structures, disposal of dredge spoil),
    2. Sealing (e.g. by permanent constructions)

II. Physical damage
    1. Changes in siltation (e.g. by outfalls, increased run-off, dredging/disposal of dredge spoil),
    2. Abrasion (e.g. impact on the seabed of commercial fishing, boating, anchoring),
    3. Selective extraction (e.g. exploration and exploitation of living and non-living resources on seabed and subsoil).

III. Other physical disturbance
    1. Underwater noise (e.g. from shipping, underwater acoustic equipment),
    2. Marine litter

IV. Interference with hydrological processes
    1. Significant changes in thermal regime (e.g. by outfalls from power stations)
    2. Significant changes in salinity regime (e.g. by constructions impeding water movements, water abstraction).

V. Contamination by hazardous substances
    1. Introduction of synthetic compounds (e.g. priority substances under Directive 2000/60/EC which are relevant for the marine environment such as pesticides, antifoulants, pharmaceuticals, resulting, for example, from losses from diffuse sources, pollution by ships, atmospheric deposition and biologically active substances),
    2. Introduction of non-synthetic substances and compounds (e.g. heavy metals, hydrocarbons, resulting, for example, from pollution by ships and oil, gas and mineral exploration and exploitation, atmospheric deposition, riverine inputs),

VI. Systematic and/or intentional release of substances
    1. Introduction of radio-nuclides
    2. Introduction of other substances, whether solid, liquid or gas, in marine waters, resulting from their systematic and/or intentional release into the marine environment, as permitted in accordance with other Community legislation and/or international conventions.

VII. Nutrient and organic matter enrichment
    1. Inputs of fertilisers and other nitrogen — and phosphorus-rich substances (e.g. from point and diffuse sources, including agriculture, aquaculture, atmospheric deposition)
    2. Inputs of organic matter (e.g. sewers, mariculture, riverine inputs).

VIII. Biological disturbance

1. Introduction of microbial pathogens,
2. Introduction of non-indigenous species and translocations,
3. Selective extraction of species, including incidental non-target catches (e.g. by commercial and recreational fishing)

ANNEX 1.4: Indicative lists of characteristics of the environmental state from the EU Marine Strategy Framework Directive

(MSFD, 2008/56/EC)

I. Biological features
    1. Biological communities associated with the predominant seabed and water column habitats
        A. phytoplankton communities
        B. Zooplankton communities
    2. Information on bottom fauna
        A. Angiosperms
        B. Macro-algae
        C. Invertebrate bottom fauna
    3. Fauna of the marine region or subregion
        A. Fish populations
        B. Marine mammals
        C. Marine reptilespopulation dynamics
        D. Seabirds
        E. Nonindigenous, exotic species or, where relevant, genetically distinct forms of native species

II. Physical and chemical features
    1. Seabed description
        A. Topography and bathymetry
        B. Annual and seasonal temperature regime and ice cover
        C. Current velocity
        D. Upwelling
        E. Wave exposure
        F. Mixing characteristics
        G. Turbidity
        H. Residence time
    2. Distribution of salinity
    3. Distribution of nutrients (DIN, TN, DIP, TP, TOC)
    4. Distribution of oxygen
    5. Marine acidification

III. Habitat Types
    1. Predominant seabed and water column habitat type(s)

A. Characteristic physical features
    a. Depth
    b. Water temperature regime
    c. Currents and other water movements
    d. Seabed structure
    e. Seabed substrate composition
B. Characteristic chemical features
    a. Salinity

IV. Other features

1. Description of the situation with regard to chemicals
    A. Chemicals giving rise to concern
    B. Sediment contamination
    C. Hotspots
    D. Health issues
    E. "Contamination of biota (especially biota meant for human consumption)"
2. Description of any other features or characteristics typical of or specific to the marine region or subregion

ANNEX 1.5: Classification of environmental impacts

Adaption of medical classification of functioning, disability and health (Dahl, 2002)[3], supplemented with general ecological functions.

I. Physical functions
    1. Sensory functions
    2. Communication
    3. Vascular, immunological, and respiratory functions
    4. Digestive, metabolic, endocrine functions
    5. Reproductive functions
    6. Movement related functions

II. Ecological Functions
    1. Regulation functions
        A. Gas regulation
        B. Climate regulation
        C. Disturbance prevention
        D. Water regulation
        E. Water supply
        F. Soil retention
        G. Soil formation
        H. Nutrient cycling
        I. Waste treatment
        J. Pollination
        K. Biological control
    2. Habitat functions
        A. Refugium function
        B. Nursery function
    3. Trophic functions
        A. Primary consumption
        B. Secondary consumption
        C. Tertiary consumption

[3] Dahl, T. (2005). International Classification of Functioning, Disability and Health: an Introduction and Discussion of its Potential Impact on Rehabilitation Services and Research. Journal of Rehabilitation Medicine, 34, 201–204.

Annex 1.6: Classification of Ecosystem Services

(Based on the Common International Classification of Ecosystem Services (CICES) developed by the European Environment Agency (EEA)[4])

I. Provisioning
    1. Nutrition
        A. Biomass
            a. Cultivated crops
            b. Reared animals and their outputs
            c. Wild plants, algae and their outputs
            d. Wild animals and their outputs
            e. Plants and algae from in-situ aquaculture
            f. Animals from in-situ aquaculture
        B. Water
            a. Surface water for drinking
            b. Ground water for drinking
    2. Materials
        A. Biomass
            a. Fibres and other materials from plants, algae and animals for direct use or processing
            b. Materials from plants, algae and animals for agricultural use
            c. Genetic materials from all biota
        B. Water
            a. Surface water for non-drinking purposes
            b. Ground water for non-drinking purposes
    3. Energy
        A. Biomass-based energy sources
            a. Plant-based resources
            b. Animal-based resources
        B. Mechanical energy
            a. Animal-based energy

II. Regulation & Maintenance
    1. Mediation of waste, toxics and other nuisances

[4] http://cices.eu/

A. Mediation by biota
    a. Bio-remediation by micro-organisms, algae, plants, and animals
B. Filtration/sequestration/storage/accumulation by micro-organisms, algae, plants, and animals
C. Mediation by ecosystems
    a. Filtration/sequestration/storage/accumulation by ecosystems
    b. Dilution by atmosphere, freshwater and marine ecosystems
    c. Mediation of smell/noise/visual impacts
D. Mediation of flows
E. Mass flows
    a. Mass stabilisation and control of erosion rates
    b. Buffering and attenuation of mass flows
F. Liquid flows
    a. Hydrological cycle and water flow maintenance
    b. Flood protection
G. Gaseous / air flows
    a. Storm protection
    b. Ventilation and transpiration

2. Maintenance of physical, chemical, biological conditions
    A. Lifecycle maintenance, habitat and gene pool protection
        a. Pollination and seed dispersal
        b. Maintaining nursery populations and habitats
    B. Pest and disease control
        a. Pest control
        b. Disease control
    C. Soil formation and composition
        a. Weathering processes
        b. Decomposition and fixing processes
    D. Water conditions
        a. Chemical condition of freshwaters
        b. Chemical condition of salt waters
    E. Atmospheric composition and climate regulation
        a. Global climate regulation by reduction of greenhouse gas concentrations
        b. Micro and regional climate regulation

III. Cultural

1. Physical and intellectual interactions with biota, ecosystems, and land-/seascapes [environmental settings]
    A. Physical and experiential interactions
        a. Experiential use of plants, animals and land-/seascapes in different environmental settings
        b. Physical use of land-/seascapes in different environmental settings
    B. Intellectual and representative interactions
        a. Scientific
        b. Educational
        c. Heritage, cultural
        d. Entertainment
        e. Aesthetic

Spiritual, symbolic and other interactions with biota, ecosystems, and land-/seascapes [environmental settings]

    C. Spiritual and/or emblematic
        a. Symbolic
        b. Sacred and/or religious
    D. Other cultural outputs
        a. Existence
        b. Bequest

Annex 1.7: Classification of environmental responses by nature of intervention

(Chopra & Group, Ecosystems and human well-being: policy responses: findings of the Responses Working Group of the Millennium Ecosystem Assessment, Island Press 2005)

I. Legal Responses
- 1. International
  - A. International Treaties
  - B. International Soft-Law
    - a. Guidelines
    - b. Standards
    - c. Codes of Practice
    - d. Resolutions
    - e. Declarations
  - C. International Customary Law
  - D. International Agreements outside the Environmental Sector
    - a. Trade Agreements
    - b. Investment Agreements
    - c. Anti-corruption Agreements
    - d. Human Right Agreements
  - E. International Enforcement System
    - a. Negotiation
    - b. Arbitration
    - c. Mediation
    - d. Inquiry
    - e. Conciliation
- 2. Domestic
  - A. Domestic Environmental Regulations
    - a. Command and control mechanisms
    - b. Volunatry agreements
  - B. Domestic Constitutional Law
  - C. Environmental Impact Assessment as Measure for Regulation
  - D. Domestic Legislation outside the Environmental Sector
    - a. Legislation on agriculuture
    - b. Legislation on forestry
    - c. Legislation on settlement
    - d. Legislation on mining
    - e. Legislation on energy production
  - E. Domestic Enforcement System
    - a. Judical review
    - b. Liability
    - c. Public environmental awareness raising
    - d. Information dissemination
    - e. Participation of stakeholders
    - f. Ombudsman laws

II. Economic Responses
- A. Command and Control Interventions
  - a. Prohibition
  - b. Zoning and designation
  - c. Direct provision of ecosystem services
  - d. Fixed quota systems
  - e. Technology Regulation
- B. Incentive-based Interventions
  - a. Tax and subsidy schemes
  - b. Tradable resource use and tradable emisson permits
- C. Voluntarism-based Instruments
  - a. Information provision and education
  - b. Voluntary measures
- D. Financial and Monetary Measures
  - a. Microcredits
  - b. Loans
  - c. Funds
  - d. Public financing
  - e. Debt swaps
- E. International Trade Policy
  - a. International Trade Agreements
  - b. Import restrictions
  - c. Export restrictions

III. Social and Behavioural Responses
- A. Population Policies (including family planning)
  - a. Stringent measures
  - b. Incentive-based measures
  - c. Voluntarism-based measures
- B. Public Education and Awareness
- C. Changing Values and Attitudes
  - a. Empowerment of communities
  - b. Empowerment of Women
  - c. Empowerment of Youth
- D. Civil society, disobedience and protest
  - a. Boycotts and bans
  - b. Demonstrations

IV. Technological Responses

1. By targets
   - A. Products
     - a. Restriction of removal
   - B. Devices
     - a. Banning the use of harmul devices
     - b. Prescribing the use of environmentally benign devices
   - C. Processes
     - a. Sequence of certain operations in the field

D. Practices
    a. Timing of harvest
2. By timing
A. Preventive technological interventions
    a. Direct interventions in biophysical processes
B. Operative technological interventions
    a. Monitoring the response of the ecosystem to human interventions
    b. Monitoring changes in the underlying biochemical processes
    c. Assessing unfavorable trends
    d. Introducing appropriate technological measures to correct unfavorable trends
C. Rehabilitative technological interventions
    a. Restoration and rehabilitation of degraded ecosystems by technological measures

V. Cognitive Responses
A. Legitimization of Traditional Knowledge
B. Knowledge Acquisition (Research) and Acceptance (Legitimization)

ANNEX 2: Media Type Classification

I. Media of first degree
    1. Visual arts
        A. Painting
        B. Photo
        C. Sculpture
        D. Graffiti
        E. Arts exhibition
        F. Photo exhibition

    2. Performative arts
        A. Theatre play
        B. Dance performance
        C. Musical concert
        D. Performance art
        E. Flash mob

    3. Education & public events
        A. Class at school
        B. Workshop
        C. Public speech
        D. Conference
        E. Public gathering
        F. Collective action event

II. Media of 2nd degree
    1. Print media
        A. Book
        B. Book chapter
        C. Scientific article
        D. Popular scientific article
        E. Technical synthesis
        F. Report
        G. Newspaper
        H. Newspaper article
        I. Magazine
        J. Magazine article
        K. Flyer
        L. Brochure

M. Poster
N. Sticker
O. Photography

2. TV
    A. TV children program
    B. TV comedy program
    C. TV drama program
    D. TV entertainment program
    E. TV factual program
    F. TV learning program
    G. TV music program
    H. TV news program

3. Radio
    A. Radio children program
    B. Radio entertainment program
    C. Radio factual program
    D. Radio learning program
    E. Radio news program

4. Film
    A. Short film fiction
    B. Full length film fiction
    C. Short film documentary
    D. Full length documentary

5. Audio & video recording
    A. Disk record
    B. Video cassette

III. Media of 3rd degree
    1. Online digital media
        A. website
        B. blog
        C. micro-blog
        D. Social media site
        E. Chat forum

F. Newsletter
G. Web video
H. Podcast
I. Videogame (online)
J. Virtual world

2. Offline digital media
   A. DVD/ Blu ray
   B. Videogame (offline)
   C. E-book