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‘Heimat’ as a boundary object?

Exploring the potentialities of a boundary object to instigate productive science-stakeholder interaction in North Frisia (Germany)

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Abstract:

The North Frisian Wadden Sea represents one of the best researched natural regions in the world. Since the end of the 1980s, scientific research has been carried out to scientifically study, analyse and assess this intertidal coastal zone under the conceptual umbrella of ecosystem research. The outcome of this assessment materialised in the establishment of the Nationalpark Schleswig-Holsteinisches Wattenmeer. Its implementation caused considerable conflicts between coastal inhabitants, national park authorities and government officials. Arguments in these disputes revolved around the validity and relevance of scientific knowledge generated to assess and legitimately protect the tidelands and areas of the Waddensea. In summary, the whole implementation process was locally perceived as a politically endorsed top-down enforcement strategy only allowing scientific knowledge for decision-making purposes while local concerns and ‘knowledges’ were not included. To learn from these developments and past mistakes, we compare concepts of co-management, boundary work and boundary objects (BO) to theoretically and methodologically explore their potentials to generate shared meanings and instigate communication in the context of future managing purposes. Against this theoretical background, we propose the empirical show-case example of the German concept of ‘Heimat’ as a BO to assess its applicability to study place-based meanings and to illustrate it as a practice-oriented point of entry to initiate productive science-stakeholder interaction (SSI) in managing the North Frisian Wadden Sea.

Keywords: Boundary object, science-stakeholder interaction, Heimat, German Wadden Sea

The North Frisian Waddensea: A contested intertidal landscape

The Wadden Sea Area along the European North Sea coast represents one of the best researched natural areas in the world. Officially described as a wetland site with tidal flats, it stretches 500 kilometres from Den Helder in the Netherlands to Skallinge north of Esbjerg in Denmark. Characterised by a unique flora and fauna, the Wadden Sea coast is a key resting place for migratory birds and was inscribed on the UNESCO World Heritage List in 2009[1].

Although the Wadden Sea Area is mainly framed as a unique natural habitat, it also represents a place with a rich cultural diversity (Fischer 1997). This is particularly apparent in the coastal landscape (Vollmer et al. 2001) which has constantly been modified throughout the centuries by coastal inhabitants and exhibits a remarkable variety of dike structures, drainage systems

[1] Due to political controversies the Hamburg part of the Wadden Sea followed with an UNESCO world heritage inscription in 2011 and the Danish part followed in 2014.

and traces of land reclamation (Allemeyer 2006). Start of the 1980s, the uniqueness of the natural ecosystem instigated an intensive scientific research programme that culminated in 1996 in the publication of the so-called synthesis report (Stock et al. 1996) for the Wadden Sea Coast of Schleswig-Holstein. Brought together under the conceptual umbrella of ecosystem research, this collective scientific study offered a comprehensive analysis of the biological uniqueness of this intertidal coastal zone undertaken by scientists. Driven by a conservationist agenda from the start, the ultimate aim of this politically supported procedure was to investigate and assess how the Wadden Sea in North Frisia could be protected from human-induced harms and negative effects caused by economic practices such as cockle fishing, hunting, intensive farming and tourism. The idea of establishing the National Park Schleswig-Holsteinisches Wattenmeer with all related usage restrictions led to concerted and sometimes fierce local resistance, with the local population particularly critical about the scientifically driven and politically endorsed top-down process of implementation (Jakubowski Tiessen 2007). This enforcement strategy created disputes (Fig. 1) and blockages (Fig. 2) which had to be laboriously settled during the following decade. As a consequence, the experiences made during the implementation period led members of the national park authorities to conclude that good processes of implementing nature protection cannot solely be informed by and based on pure scientific knowledge as legitimate foundation for decision-making: it should rather be grounded in social interaction, intensive communication and mutual understanding and meanings to cooperatively define a shared knowledge basis and to achieve commonly defined targets.

As a reaction to the long lasting disputes, a survey was commissioned by the national park authority to get a better understanding of the socio-cultural framing of the North Frisian Wadden Sea as ‘Heimat’ (Reusswig/Schwarzkopf 2003) in which flagship species such as different kinds of seagulls, landscape aspects, wideness, identity issues such as being Frisian and emotions such as peace and love for the nature of the Wadden Sea emerged. The elements disclosed by Reusswig and Schwarzkopf (2003) were estimated as functional by the national park authority as they were conceived to serve as a starting point for dialogue between local inhabitants and the scientists of the national park for the implementation process of the UNESCO World Heritage (Krauß/Döring 2003). Thus, a move towards a ‘Heimat’-based (Stewart et al. 2013) management took place which ‘Heimat’ that did not prove to be effective in resolving all controversies: it however proved to be a useful starting point to facilitate dialogue and generate commonality and mutual understanding. This step towards considering socio-cultural knowledge as a significant element of the decision processes represents an

important turning point as it was the first attempt to acknowledge non-scientific knowledge as an important ingredient for the management of the Nationalpark Schleswig-Holsteinisches Wattenmeer. Hence, the development demonstrates a conceptual shift from government to governance (Evans 2012: 32) that later on materialised in new institutional arrangements, management approaches, the re-organisation of political responsibilities and re-arrangement of local power relations. In summary, the experiences of disputes and conflicts instigated a rather unintended process of co-management in which a reflection on knowledge boundaries and boundary work emerged.

This empirical observation forms the starting point of this paper in which we aim at contributing to research undertaken on knowledge boundaries and boundary work by emphasising the relevance of boundary objects (BO) (Griesemer/Star 1989) for co-management. Co-management is widely conceived as an approach that enables communities to constructively participate in environmental management decisions as it aims at a co-operative and collective generation of a shared knowledge-base for decision-making. For this to be achieved, a symmetric and integrative management of different types of knowledge is essential and still represents a challenge as many studies are not explicit of how knowledge integration and sharing could practically be achieved. Put more precisely, approaches in co-management in many cases struggle with conceptual shortcomings implicated in the notion of knowledge as they neglect intrinsic properties such as learning, re-framing and understanding (Jasanoff 2006). To contribute to the growing body of work addressing this misconception, the present paper reveals the relevance of co-management, knowledge boundaries and boundary work in knowledge-action-systems (Gieryn 1983; 1999; Clark et al. 2010) to explore the potentials of 'Heimat' as to instigate productive science-stakeholder interaction (SSI) in North Frisia.

We start with an impressionistic outline of conceptual aspects revolving around co-management, boundary work, BO and knowledge integration. Afterwards, we methodologically depict the prerequisites of establishing 'Heimat' as a boundary object before we empirically assess our findings with regard to whether 'Heimat' could be a useful boundary object for SSI in North Frisia. We conclude by reflecting on theoretical, methodological and practical implications of the concept of BO and assess their relevance for SSI.

Knowledge integration in science-stakeholder interaction: theoretical issues

The organisation of and differences in knowledge has received considerable attention in research on the SSI. A growing awareness emerged among scientists, practitioners and politicians during the last decade that decisions on environmental issues could not simply be settled by scientific knowledge but requires the integration of other kinds of knowledge too. To date, knowledge has often been reified as an entity with characteristics such as difficult to be transferred, tacit in nature and tricky to be managed. It has been described as localised in scale, embedded in cultural environments and tied up in specific socio-political practices and contexts. There is thus a specific social, spatial, practical and experiential side to the generation, maintenance, implementation and management of knowledge. This explains why it is difficult to transfer knowledge from one context to another (Wenger et al. 2002).

Although there is a long standing tradition to involves "people [from] outside the formal government apparatus in decisions" (Fiorino 1996: 195) about environmental issues, only recently experiential attempts such as science-stakeholder modelling (Whatmore/Landström 2011; Lane et al. 2011) or participative flood risk management (Lane et al. 2013) have been undertaken. Such approaches, theoretically based on procedures such as competency groups or co-management, explored and underlined the relevance of socially symmetric and active participation of all parties concerned. Especially Berkes (2009) – among many others – has underlined the relevance of an active participation in terms of decision-making and stressed the significance of different types of knowledge with regard to their relational character and the importance to manage them in a socially acceptable and democratic way. Thus, integration of scientific, local and political knowledge is theoretically conceived a basic prerequisite in all sorts of environmental management and participatory contexts while still a practical top-down knowledge transfer (Jasanoff 1990) prevails in many management contexts. This is inasmuch surprising as recent research on the science-stakeholder-interface and SSI has conceptually distanced itself from a simple reification of knowledge to be provided and increasingly emphasised a process-oriented concept of knowledge that results from learning, reframing and understanding (Jensen 2005; Huitema/Tournhout 2009; Runhaar/van Nieuwaal 2010; Puente-Rodriguez et al. 2015).

It should, however, be noted that such a process understanding of knowledge runs into the danger of an all too cognitive approach that overlooks the social side of knowledge generation and integration. It is thus essential to stress that learning, reframing and understanding as situated practices "in which engagement between people [occurs] in situated places [...],

[where] concepts and practices become reliant on situated circumstances for their relevance and meaning" (Howitt/Suchet-Pearson 2006: 332). Not only the generation of knowledge systems, but also the processes of their negotiation, evaluation and integration should consequently be conceived as relational, place-bound and community-centred practices. They include the negotiation of meaning among partners in institutionalised contexts and against the background of sets of existing social relationships (Wynne 2001).

The generation and integration of knowledge can thus be conceived as a multifaceted social process of co-production whose practices have been investigated by Gieryn (1983, 1999) in terms of boundary work (Tournhout et al 2007). Gieryn's work was mainly devoted to the separation and management of non-scientific from scientific knowledge domains and the re-framing of his boundary concept in terms of interfaces or bridging devices called BO by Star and Griesmer (1989) introduced a conceptual change. Griesemer's and Star's idea of BO (Bowker and Star 1999; Star 2010) led to an understanding of how knowledge is socially classified and orders human interaction while it simultaneously provides an approach to detect entry points to investigate and instigate knowledge co-ordination and integration in environmental management (e.g. Turnhout 2009; Goldman/Turner 2011; Goldman 2011; Swart/van Andel 2008; Swart/van der Windt 2014; Kupper 2014). BO could thus be conceived as mediators or translators between types of knowledge belonging to different social worlds holding different shapes (Robinson/Wallington 2012). This means, as shown in the case of Star's and Griesemer's (1989) study of research activities in a Natural History Museum that different objects such specimens, maps and field notes represent BO: their physical materiality matters as much as their intangible meanings and symbolic dimensions. The study led the authors to develop four categories of BO:

- The repository: a set of classified and indexed objects which are grouped in a standardised fashion that enables to manage heterogeneity in a modular fashion.
- The ideal type: a general model which abandons local or idiosyncratic specificities to enable collective categorisation and knowledge generation in through coordinated action.
- Coincident boundaries: referring to objects which share the same boundaries with different internal forms.
- Standardised forms: facilitates communication and the grouping of diverse content.

(Trompette/Vinck 2009:d)

As we see, BO could possess different ontological statuses and as multidimensional entities they manage to bridge conceptual dichotomies and tensions residing between general-specific, abstract-concrete, material-conceptual and conventional-user-adapted aspects (Trompette/Vinck 2009: d). This conceptual flexibility is, according to a revision of the approach by Wenger (2000), based on the four intertwined functional dimensions of abstraction (facilitating dialogue between social worlds), multi-tasking (different practices and activities are possible), modularity (different characteristics of the object can serve as a basis for dialogue between actors) and standardisation of information (the information in the object is rendered interpretable) (Trompette/Vinck 2009: e). These four functional dimensions of BO provide actors, who inhibit different social worlds, with sufficiently structured meanings to recognise, negotiate, share and integrate various forms of knowledge.

It should, however, not be overlooked that BO also depend on and need so-called boundary agents (e.g. individuals or organisations). These intermediaries gather and manage information needs, offer problem definitions and provide problem solutions by communicating and building relationships across knowledge boundaries separating social worlds (Nowotny et al. 2001). Especially human boundary agents are of vital importance as coordinators and facilitators of knowledge integration because they are familiar with contexts and can initiate processes in which boundary work is carried-out through the co-production of BO (Star/Griesemer 1989). In brief, BO are both cognitively and socially co-produced entities that secure the probity of all participating knowledge systems and the social integrity of actors involved (Fujimura 1992).

In summary, one can say that research on co-management and boundary work are both based on the assumption that knowledge is generated in particular contexts and sites of application and differently dispersed among social actors. This requires situated and socially sensitive processes of translation and context-specific procedures of co-management. Such a situated perspective should recognise that the integration of knowledge can be achieved through boundary agents (Star/Griesemer 1989) and co-produced BO. Their integrated application holds the potential to establish a practical, meaningful and conceptually robust basis for stakeholder involvement in joint management actions. Hence, effective boundary work should be based on meaningful participation and joint knowledge production by all parties involved, it should be structured by a governance structure that warrants the accountability of boundary work to all stakeholders participating and it should secure the co-production shared meanings via BO for productive SSI.

Methodological prerequisites for establishing 'Heimat' as boundary object

To establish 'Heimat as a boundary object to instigate productive SSI, it is important to elicit and analyse the intangible meanings of 'Heimat' on the German North Sea coast using a combination of a qualitative and a quantitative approach. The main aim in our study was to analyse the associations people develop when asked about their Wadden Sea related 'Heimat' and exploring their strategies of giving meaning to it. First, a random street survey was conducted among 15 to 88 year-old regional inhabitants in 18 towns between June and September 2008. The 18 towns, situated along the German Wadden Sea between Greetsiel in Lower Saxony and Niebüll in Schleswig-Holstein, were selected with regard to their proximity to the coast, distance to one another (20 kilometres apart) and comparable size (no more than 10,000 inhabitants) (Fig. 3). In each town, 30 street interviews were conducted using a standardised survey form containing primarily open questions covering aspects of 'Heimat', views of nature, the environment, hazards and how the region should develop in the future. Passers-by were asked at random in places such as shopping malls, parks, pedestrian zones and train stations. Only those local residents who had lived in the respective localities for more than 5 years were included in the survey. Gender-wise, the dataset consisted of 422 men and 440 women with an average age of 46 years.

Results from this survey were then used to develop a qualitative interview guide for in-depth interviews with 16 interview partners living in the German Wadden Sea area. Interview partners were contacted via e-mail with the help of the local 'Island and Hallig Association' and consisted of 11 male and 5 female persons that had lived in North Frisia for more than 20 years. After having agreed to be interviewed, interviewees received an e-mail announcing the main aspects to be discussed during the interview. Interviews lasted between 50 to 95 minutes, were recorded in homes or offices with the help of a tape recorder, transcribed and analysed according to the procedures outlined in Grounded Theory (Charmaz 2006). Each interview opened with the general question of what it means for the interviewee to live in their particular locality. This was followed by other questions, such as whether they consider themselves Frisian, how they would assess recent changes in their localities and what future threats they consider most relevant to their region. Although the use of the term 'Heimat' was purposely avoided by the interviewer, all interviewees used it frequently and employed it to explore their own conception of 'Heimat', indicating the term still holds semantic and communicative relevance. Interviewees mostly identified themselves as Frisians, conceived the region of North Frisia as their 'Heimat'.

The social construction 'Heimat' – studying place-based meanings quantitatively

In the random street survey conducted in several coastal towns on the North Sea, 'Heimat' was approached by asking residents how they would personally describe what the term means to them. It became apparent that place-based meanings of 'Heimat' could broadly be assigned to emotional, wider regional and more local place-based categories, with interviewees merging feelings of belonging with characteristics of the landscape and specific places experienced (Fig. 4). Almost one third of the responses gathered (32%) described 'Heimat' as a feeling of belonging and safety. Paradigmatic statements such as "Heimat is where I feel comfortable" clearly indicate this aspect, although the meaning of 'comfortable' remain unclear. This problem was resolved by looking at the category of family and friends (18%) which emphasises the unique relevance of social contacts and families in generating this feeling of comfortable familiarity. This aspect is further corroborated by quotes that depict 'Heimat' as a place "[...] where you know you are welcome", "a place you can return to any time" or "where you know everyone when you cross the street and say good morning to them", which all highlight feelings of safety and familiarity. The place-based meanings of 'Heimat' thus reflect a spatially and socially experienced construct based on all sorts of social relations and interactions. This is also mirrored in the fact that 'Heimat' appears to be an important concept to people: Out of 862 respondents only two refused to explain what the term meant to them.

'Heimat' is also experienced through ideas and aspects revolving around landscape and the coast (19%). Over half of the responses refer to the North Sea as an important symbolic reservoir from which they construct a strong sense of connectedness to the coastal region. Numerous responses refer to aspects of untouched nature and the close relationship that exists between individuals and the natural coastal environment surrounding them. Quotes such as "being on the beach with horses and dogs" or "when I look out to the Wadden Sea I feel home" provide insight into experiences related to companion species and landscape as an essential component of 'Heimat'. Nature is another interpretative reference point in depicting important essential characteristics of 'Heimat' (Fig. 5). The coastal landscape with its features of water and mudflats (the Wadden) (20%), flora and fauna (15%), an untouched natural area free of buildings (11%) and meadows and fields (8%) provide a matrix of elements which are used to explain elements of the natural environment inherent in 'Heimat'.

What becomes apparent in the above examples is that 'Heimat' is explicated and refined by the respondents by drawing on a variety of typical elements that can function as entry points for interaction and at the same time offer valuable insight into how coastal dwellers constitute

their ‘Heimat’. The deconstruction into typical constituting elements provides an insight into *what* specific characteristics, meanings and experiences people relate to ‘Heimat’. The survey responses and the paradigmatic examples thus provide a conceptual modularity of the BO ‘Heimat’ in which social relations, coastal landscape, specific places and elements of nature can serve as a basis for dialogue. ‘Heimat’ could thus be classified as an ideal type that once deconstructed could open-up conceptual entry points to enable collective knowledge generation. There is, however, a methodological limitation in the quantitative approach: it productively aggregates and outlines *what* respondents have said without analysing *how* they express their sense of ‘Heimat’. The *how* is important as the analysis of the language provides a deeper insight into and a better understanding of the meaning structure of ‘Heimat’ which forms an important component productive SSI.

The Social Construction of ‘Heimat’ – studying place-based meanings qualitatively

In the previous section, we have presented and analysed *what* people said when they were asked to explain their notion of ‘Heimat’. The random street survey and the quantitative aggregation of the data gathered provided an important insight into the meaning matrix by which people express what ‘Heimat’ is for them. In order to analyse *how* and *by which means* people manufacture ‘Heimat’, we now turn to the systematic study of the language permeating the two categories or interpretative repertoires (Wetherell/Potter’s 1988: 172) of *social relations* and *nature/landscape* that structure the category ‘Heimat’.

The following interview extracts exemplify the kind of answers given when asked what living their specific place called ‘Heimat’ meant to them.

1. Well, I was not born on this island. I come from Schleswig-Holstein and my wife and I we both arrived here 40 years ago. We were just married and I applied for a job here. We wanted to stay here for 2 years but we then stayed for 40 years as we enjoyed island life and the nature. Our children were born here; they grew up and went to school. The island quite quickly became our ‘Heimat’ because of the people, friends and family and this beautiful nature. It is a healthy social and natural environment. We like all seasons here, the wild North Sea, the waves, the wind and the infinite horizon. We really feel at home (heimatlich) here. (Interviewee 1)

In this quote, the interviewee draws on a multitude of aspects to explain what ‘Heimat’ means to him. Besides family references (marriage, having children and raising them) emphasis is put on the relatively fast development of social relations (became 'Heimat' quite quickly because of the people, the friends and the family), the natural environment (beautiful nature, the wild North Sea, the waves, the wind and the infinite horizon) and the place of residence

(this island and the island quickly turns into our 'Heimat'). What is striking about the quote is the detailed aesthetic (beautiful, wild, infinite) representation of nature.

Such aspects could also be found in other interviews, although the following emphasises 'Heimat' as birthplace:

> 2. For me, to live here means, ah, 'Heimat' to me. I think Heimat is the place where you are born, where you feel safe and encounter a healthy social and natural environment. Where nature can still be experienced, where you find people whom you know and appreciate. It's a place where you have family, where the children feel safe [...]. To sum up, that is 'Heimat' for me. (Interviewee 6)

The quote reveals the previously encountered interpretative repertoires to depict what 'Heimat' consists of. What is striking is that both quotes hinge on the metaphor of a 'healthy social and natural environment'. This metaphor was encountered in almost all interviews, suggesting it is a meaning device which helps interviewees to conceive social, landscape and place-related visions of 'Heimat'.

Beyond these more general insights, a closer look at the two interpretative repertoires found indicates that they draw on a restricted set of linguistic features. This can be seen in the following extract where social relations are metaphorically depicted as a force field.

> 3. I mean, what is important is the fact that we all here are straightforward human beings. We are that way and for me the social environment of friends and family is most important. They represent some sort of a force field which is important to me. (Interviewee 4)

What becomes apparent in the quote is that, in fact, two metaphors are at work. On the one hand, the metaphor 'social environment' provides an abstract topographical image of social relations while on the other hand the 'force field' metaphor plays with ideas of gravitation and projects this onto family and friends: They become a centre of social gravitation and bonding.

Social relations are also depicted by the German metaphor 'gefangen genommen'. Literally translated as 'to be captivated' it holds a strong positive meaning, especially when nouns such as family, friends and friendship appear in the linguistic context. In the following example, local inhabitants literally 'socially captivated' the interviewee.

> 4. For me, it is the people you know and obviously my family and the friends here with whom we've had a good time. Friendship, that really counts, friends and family. I mean the people and nature captivated me [haben mich gefangen genommen]. (Interview 7)

Considering these results as a whole, it becomes apparent that the interpretative repertoire 'social relations' forms a basic element in which 'Heimat' emerges through the lens of human relationships. Metaphors help to conceptualise basic aspects of 'Heimat' while the recurrent

use of nouns such as family, friends and friendship consolidate the meaning of social relations.

It is, furthermore, interesting that quote 4 also provides a link to the natural environment which seems to also bind interviewees metaphorically to their 'Heimat' (nature captivated me). In fact, aspects of landscape and nature are important interpretative repertoires by which coastal inhabitants define or interpret 'Heimat'. This is reflected in the following quote:

5. Yes, there is the North Sea and it is as unique for me as the coast or the Wadden Sea. That is true and one has to respect the sea as it can be very dangerous. But it can also be very beautiful; it provides a lot of beautiful things. Well the sea that is waves and a stroll on the beach to see all the colours. [...] With the winds and sometimes the silence and the relaxed atmosphere. (Interview 9)

The sea is experienced here as a dangerous entity that can also – metaphorically speaking – provide beautiful things. The aesthetics of nature and the landscape (e.g. colours) is further elaborated with reference to waves as a typical element of the sea and the practice of strolls on the beach which allow experience of a typical atmosphere (wind and silence). Such aesthetic or even contemplative visions of nature in relation to 'Heimat' appear often.

6. I enjoy nature here on the coast, this slowed-down life. It is not as hectic as in cities and the tranquillity [...] means a lot to me. The sea really calms me and I very much like the sound of the waves. (Interview 10)

Here again aspects of tranquillity are depicted and the dichotomy between land and city is used to explain differences in ambience and natural atmosphere. Reference is, nevertheless, made to emotional aspects (tranquillity means a lot to me) while the sea metaphorically exerts a rather therapeutic and spiritual impact (sea really calms me). It becomes evident that the interpretative repertoire of nature and landscape forms an important element in the construction of 'Heimat' as it not only deals with the physical aspects of the land but forms a medium through which people emotionally relate to and spiritually experience it.

The qualitative analysis was able to find two interpretative repertoires which are used to semantically describe the essence of 'Heimat'. The categories 'social relations' and 'nature/landscape' revealed a complex network of meanings that develop into a representation of 'Heimat' based on the key metaphor of a 'healthy social and natural environment'. This metaphor appeared to enable interviewees to constructively blend aspects of nature and social life into the concept of 'Heimat'. The categories, furthermore, relied on metaphors (force field; captivated; nature/the sea provides beautiful things; sea calms me) and used words from the lexical fields of social relations and nature/landscape. Seen from the perspective of research on BO and the different types of BO, 'Heimat' represents an ideal type that is engendered by a specific set of place-based meanings. These meanings, as revealed by the

qualitative analysis, were structured by metaphors that semantically merged the natural and the social which underlie a strong local place attachment. Knowledge about these place-based meanings and their semantic in-depth structure could help to develop context-bound and place-sensitive entry points for SSI.

The potentials of 'Heimat' as a BO in science-stakeholder interaction

'Heimat' is a widespread, socially accepted and finely structured concept among coastal inhabitants on the North Frisian Wadden Sea Coast. It represents a multi-faceted notion endowed with a broad range of intangible meanings, beliefs and experiences that permeates local knowledge about the Wadden Sea and characterises the way in which coastal dwellers in North Frisia feel attached to it. The quantitative and qualitative methods applied in the context of this paper productively assisted in revealing these intangible place-based knowledge dimensions to a certain degree and offered a way by which productive SSI could be pre-prepared before processes of negotiation start. In our view, a detailed investigation of 'Heimat' as a boundary object represents a basic prerequisite for symmetric (Latour 1998) SSI that should include all those involved in a situated management process. Paying attention to the different conceptual layers engendering 'Heimat' as spread among scientists, managers, politician and stakeholders can help to create productive self- and outside perception because understanding different motivations and ways of *why* and *how* people relate to a certain stretch of land or a natural area helps to talk about what is really at stake. It aids to understand each other properly and – if possible – develop common goals, motivating all parties involved to engage in environmental protection schemes (Swart/van der Windt 2014).

Theoretically speaking, it can initiate a process of boundary work in which different kinds of knowledge are not separated but in which the BO could be used as mediator or translator between different types of knowledge. Only then contextualised processes of knowledge co-ordination and integration can start. Such an approach has already been applied in the context of North Frisia and reached political decision makers, as demonstrated by a recent example. In his commemorative speech to mark the retirement of the former head of the 'Nationalpark Schleswig-Holsteinisches Wattenmeer' Bernd Scherer, the current Minister of the Environment of Schleswig-Holstein, Robert Habeck, explicitly referred to the importance of emotional bonds between people, the region and environmental protection. He pointed out that "relationships with places are changing and socially negotiated" and that "politics creates public opinion through the battle over terms" (Habeck 2014:25) or – as we would say – BO.

Although BO have proven to be of certain analytical and practical value in the present context, one has to bear in mind that they are the productive outcome of situated interaction and relational practices. Thus, our results are not transferable to other contexts as processes of negotiating knowledge boundaries and the development of BO are place and context-bound. Conceptually, however, we would welcome more empirical work on BO in the area of environmental management which is necessary to assess their theoretical validity for SSI. This mainly concerns the evaluation of different types of BO and the analytical practicability of Wenger's (2000) four analytical dimensions that have been applied here for the first time to environmental issues. Only when this scientific assessment has been brought further, the concept of BO might be of practical use for environmental managers in the context of 'planaging' (Ratter 2001). Despite these challenges however, our exploration of the potentialities of 'Heimat' as boundary object to instigate productive SSI offers the possibility to develop a way to jointly face up to environmental issues in the North Frisian Wadden Sea, to manage them and jointly plan for the future.

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Figures:

Fig.1: Demonstration by local people in 1996: 'The Wadden Sea is a livelihood for fishermen and not a playground for scientists.' Photo by Hendrik Brunckhorst.

Fig. 2: 'Down with Eco-dictatorship'; 'God created the sea, the Friesian the coast.' Photo by Martin Döring.

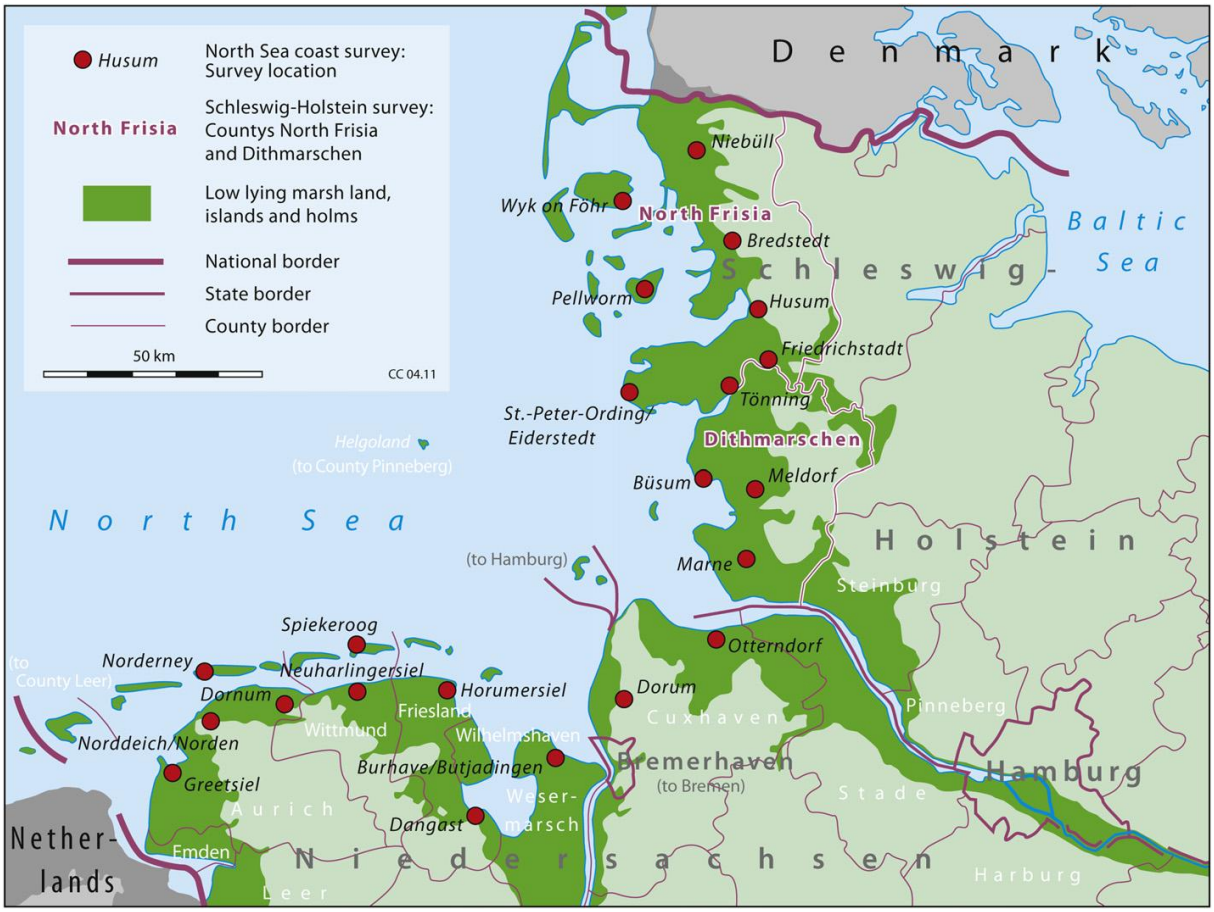

Fig: 3: Map of the Wadden Sea – Survey locations (Ratter et al. 2009)

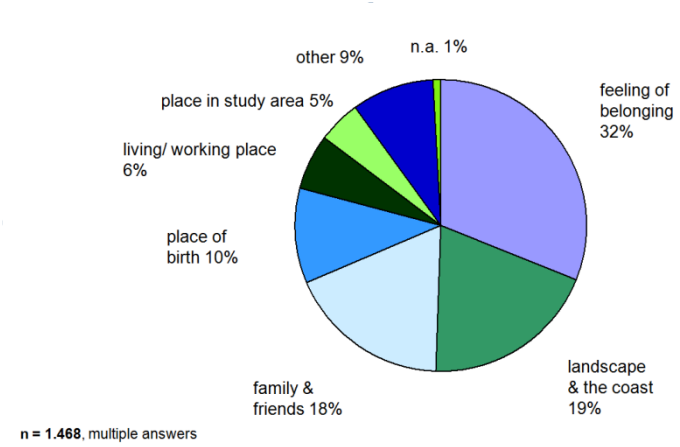

Fig. 4: Answers on the question What is ‘Heimat’ for you? (Ratter et al. 2009)

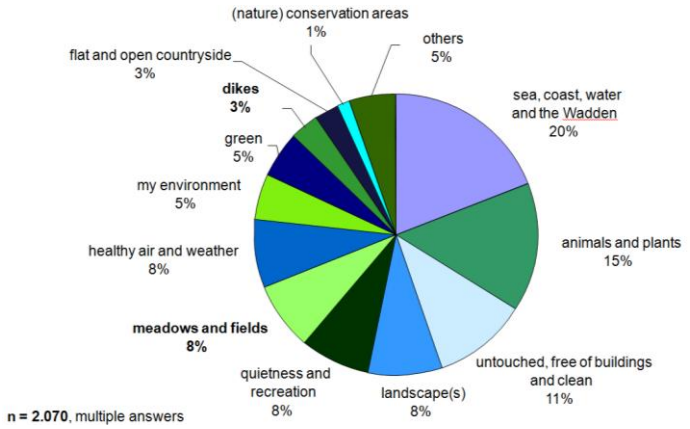

Fig. 5: Answers on What is nature for you? (Ratter et al 2009)