

Scientific publication concerning the EuWatHer project



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The EUWATHER Project: Optimizing the Interplay between Database and Narrative

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With the spread of digital media and affordable smartphones with near-constant internet access and GPS technology, tourism has taken on new forms. Tourists no longer rely solely on human tour guides or books to introduce them to places of cultural and natural heritage, but have turned to web applications, providing them with maps, lists of attractions and descriptions. As such, the responsibility to inform the visitors has expanded from heritage professionals and organisations to include app makers and amateur historians and tour guides. Internet encyclopaedia and archives form important sources of data for these new tourist portals; new stories are written and old ones revised. The availability of reliable and carefully designed online datasets of cultural and natural heritage, for designers of apps and itineraries to draw from, is therefore of pivotal importance.

Designing these datasets poses questions about the relationship between archive, database and narrative. Described as “natural enemies”¹ by Lev Manovich in *The language of new media*, database and narrative have often been seen to oppose one another. While the database is not restricted by linearity and can continue to unfold in space as new data become available, the narrative creates coherence between datapoints by means of its linear unfolding through time, but is limited in its ability to take on new datapoints. More recently, however, other scholars have attempted to reconcile the two and show them to be, what Katherine Hayles calls, “natural symbionts.”² Datasets of cultural heritage used for the design of tourist itineraries illustrate this balance; collecting (digital representations of) cultural objects in databases is often based on pre-existing narratives and allows for a perpetual extension and re-ordering of the data. In turn, different narratives can emerge from this set by selecting smaller sets based on criteria relevant to the particular context.

The interaction between database and narrative is closely related to the connection between database and canon: what is selected to be part of the database, what is knowingly left out and – perhaps more importantly – what is unknowingly left out? In what

¹ Manovich, Lev. *The language of new media*. Cambridge: MIT press, 2001; p.225.

² Hayles, Katherine. “Narrative and database: natural symbionts”. *PMLA* 122.5 (2007): 1603-1608; p.1603.



ways can the database help overcome traditional problems of canonization? How are selections of smaller datasets lifted out of the database and what biases might enter into this process? The problem of the canon is by no means new and many of the historical, art historical and literary canons have been attacked and amended over the last few decades with the rise of fields such as poststructuralism, gender studies and postcolonial studies. But however much we may try and correct earlier canons³, to make them more inclusive and diverse, the core issues of selection, exclusion and bias remain. The selection of data to be included takes place based on narrative; myths about the cultural and natural identity of regions influence the selection process. The selection, in turn, reinforces the myth.

The interplay between the database and narrative has important implications and potential for the field of cultural tourism, something we experienced first-hand in the European Heritage Plus research project *EUWATHER - European Waterways Heritage: Re-evaluating European Minor Rivers and Canals as Cultural Landscapes*⁴. Over the last two years this European project has worked on the design of four datasets of cultural heritage. The datasets are available online (www.waterwaysexplorer.org) and are currently being used to design tourist itineraries. Three of our boating itineraries in the Netherlands, *Nieuwkoop*, *Enkhuizen* and *BroekerVeiling*, can be found at www.izi.travel (search for “Waterways Explorer” plus “Nieuwkoop”, “Enkhuizen” or “BroekerVeiling”). In creating these collections and itineraries, the reciprocity between database and narrative has played an important role. It led us to search for ways of bypassing grand narratives and allowing for different, possibly contradicting myths and selection criteria to be part of the same digital archive, in order to create nuanced and educational tools for tourism. Digital archives like our datasets open up new forms of curatorship and enable experiments with curated, semi-curated and (relatively) un-curated space.

This paper, in which the EUWATHER project will be used as a case study for a theoretical exploration, will discuss the advantages and disadvantages of several practices which aim to expand the archive and optimize the relationship between database, canon and narrative. In particular, I will look into interdisciplinary approaches, strategies of combining and connecting diverse (counter-)narratives, database geo-referencing, and audience participation.

³ For instance in: Pollock, Griselda. *Differencing the canon*. London and New York: Routledge, 1999.

⁴ www.nwo.nl/en/research-and-results/research-projects/185/16285.html.



The *EUWATHER* project

The project EUWATHER is a collaboration between various partners in four countries. The Dutch team of researchers and cultural heritage organisations have worked on the design of a database, as well as several itineraries for a smartphone app for tourists. The international project concerns the presence of artificial waterways connected to natural hydrography and the cultural and natural heritage that has accumulated around these waterways over the centuries. The project intends to promote the knowledge and rehabilitation of the unique cultural heritage of these waterways in four European pilot regions within the UK, Spain, Italy and the Netherlands. In collaboration with local inhabitants, visitors, commercial stakeholders and public sector parties, a body of data has been generated that can reveal the cultural and artistic heritage of the minor waterways in these areas. To facilitate the dissemination and visualization of these data, a spatial data infrastructure (SDI) has been designed. The overall objective is to develop new opportunities for eco-tourism aimed at sustainable development of the studied areas.

The database currently comprises data from a number of cultural heritage collections, including Rijksmuseum Amsterdam, museum BroekerVeiling, the Leiden University Libraries and the district water control board Hollands Noorderkwartier. The process of selecting objects from these collections was based on location data (of locations represented in the cultural objects, *e.g.* paintings); themes of history, art history and nature conservation; and planned routes for tourist itineraries. The data have all been annotated, with the most important metadata fields providing: the official name of the object, its author/creator, the year of creation, the type of object, collection of origin and inventory number, physical location, location of represented content (*e.g.* in the case of a painting of a church: the location of the depicted church), author of the record, keywords and description. Of each object, an image has been included.

An interest in the narratives surrounding the studied landscapes and their cultural histories underlies the project and has played a pivotal role in the design of the data-structures and the smartphone app with tourist itineraries. The project is therefore a good example of the intricate reciprocity between narrative and database. Our Dutch research team – tasked with designing the data structure, the metadata annotation of data objects and the interface of both database and smartphone app – has kept this interplay in mind, trying to optimize the symbiotic relationship between narrative and database. Rather than replace one system of representation with another, I believe we should foster the symbiosis between the two and use it to our best advantage, while remaining aware of



the human context and the potential biases and assumptions influencing the design decisions.

Several aspects of the process of creating our data-structure have direct bearing on the interplay between narrative and database and will be discussed here. In the context of various theoretical positions on the relationship between database and narrative, I will discuss the implications of the following practical strategies: using an SDI in embedding geographical information; interdisciplinary collaboration; layering of narrative and the translation of database to tourist guides. Let me start off, in the next section, by highlighting the differences between narrative and database and explaining the benefits of the latter to our project. In the section that follows, I will move away from the differences and look more closely at the way narrative and database can be translated from one into the other, bringing the two forms of representation together again, to make the most of their symbiotic relationship. The analysis will end with some notes on the importance of audience participation.

From narrative to database and back

In making sense of the world and our lives, whether it be through myth, religion or science, human beings have used narratives for centuries. The linguistic technology of the narrative has been around almost as long as our species.⁵ The a priori human intuition of time and space urges us to find causality in all that we encounter and causality translates itself into stories. With the rise of Postmodernism, however, the authoritative role of the narrative became contested. That is not to say that stories lost their relevance in everyday life, but the belief in grand, singular and universally true narratives – Lyotard's meta-narratives – was lost.⁶ With the decline of the meta-narratives, we are left with a multitude of smaller, conflicting narratives, describing and explaining world events in different ways and from different angles. The stories coexist and vie with one another for authority. In *Staging the archive*, Ernst van Alphen describes these as working "rhetorically: not on the basis of their truth value, but performatively."⁷ Rather than being reflections of universal truths, they are discursive constructions, creating regimes of truth.

Tourist narratives have similarly become more diverse. With the addition of new voices in history, new stories are being marketed in tourist itineraries. These work performatively,

⁵ Hayles, p.1605.

⁶ Lyotard, Jean-François. *La condition postmoderne: rapport sur le savoir*. Paris: Les éditions de minuit, 1979.

⁷ Van Alphen, Ernst. *Staging the archive. Art and photography in the age of new media*. London: Reaktion Books, 2014; p.9.



changing our common understanding of history; the rise of ‘black tourism’ (also dark or grief tourism), focused on stories of atrocities and oppression, attests to this. In designing our EUWATHER database we were aware of the existence of different voices putting the landscape and its cultural heritage into perspective. Our cultural understanding, for instance, of the significance of water in the Dutch landscape has shifted over time, ranging from a force to be overcome to an essential aspect of the land’s identity in need of protection.⁸ An example of the co-existence of two stories of origin, vying for acknowledgment, is provided by the conflict between reed cutters and the Dutch organisation for nature conservation, Natuurmonumenten. While reed cutters point to the cultural interest in preserving the tradition of their profession, Natuurmonumenten prioritizes the preservation of natural heritage, endangered by the reed cutters.⁹ Both parties rely on historical narratives in supporting their claim of the authentic identity of the region. Such diversification of narratives and the decline of the grand narrative has prompted questions about suitable systems of representation.

It is in this context that the archive has gained momentum as a way of understanding the world. While the narrative is a linear unfolding – through time – of events and data, the archive is rhizomatic and relies less on causality, although it can incorporate it. As such, it seems a promising medium to represent multiple, coexisting narratives simultaneously and without the (immediate) need for hierarchy. The decline of the grand narrative has therefore coincided with the rise of the archive.¹⁰ The practices of archiving and categorization have been theorized in Foucault’s thinking, most notably in *The order of things* and *Archaeology of knowledge*, as well as in Derrida’s *Archive fever*. In recent decades the field of Memory Studies has added to the importance of the archive. Memories (both cultural and personal) do not reflect fixed narratives, but rather construct truths about the past anew with every instance of remembering, thereby reshuffling facts and their interpretations. In this way, a multitude of stories can develop and exist at the same time. As archives collect and preserve the building blocks of this process of remembrance, Van Alphen argues that “archives are no longer passive storehouses of old stuff, but active sites where social power is negotiated, contested and confirmed.”¹¹

⁸ Raad, Jacques de & Laura Kooistra (eds.). *De Nieuwkoopse Plassen – op en top een topmoeras*. Natuurmonumenten, 2012; pp.11-19.

⁹ Raad, Jacques de & Laura Kooistra (eds.). *De Nieuwkoopse Plassen – op en top een topmoeras*. Natuurmonumenten, 2012; p.39; Oostermann, Jaap (dir.) *Licht, lucht & water*, Odesign Producties, 2011.

¹⁰ Van Alphen, p.7.

¹¹ Van Alphen, p.16.



This holds true for the EUWATHER dataset as well; each of the objects in our database can be embedded in multiple stories. A photograph of a reed cutter in the Nieuwkoopse Plassen, from 1886, (see Fig. 1) can be given meaning by different voices and within diverse narratives. Constructing one all-encompassing narrative of the region will assume a singular, static context within which this artefact takes up a definitive meaning. However, organizing these objects initially within an archive, rather than a narrative, allows us to do what Jonathan Culler described when he suggested “framing the sign”¹²: it will allow us to move away from the perfect reconstruction of *the* context. Culler introduced the concept of the frame to prompt us to keep in mind that frames are subjective and discursive and never natural or universal. We pick our frames depending on what message we try to communicate. The archive facilitates the polysemic nature of objects such as the cultural artefacts we have collected. Existing in the vast set of data instances, each object can retain its independence. A moratorium is in place, allowing one to postpone the act of permanently selecting and to hold on to all possible stories at the same time, suspended in mid-air. A specific narrative can be ‘lifted out’ of the archive by selecting a partial set, using one perspective or narrating voice as a filter in selecting objects and *framing* them into a narrative. In this way a ‘framed’ canon is constructed. To stay with our previous example, the two sets of objects chosen to tell the separate stories of Natuurmonumenten and the reed cutters will partially overlap but the objects appearing in both will be framed differently.

¹² Culler, Jonathan. *Framing the sign: Criticism and its institutions*. Norman and London: University of Oklahoma Press, 1989. p. xiv.



Figure 1. Peter Henry Emerson, *Reed cutter* (1885-1886), photograph, 28 x 20 cm. Collection Rijksmuseum Amsterdam, The Netherlands.

A further reason the archive has become more relevant in recent decades is the increasing importance of the computer and with it the database. Databases, and in particular those available online, have revolutionized the practice of archiving, in terms of storing, ordering and retrieving data. The act of framing, introduced above, can be translated into the simple computational task of filtering and selecting for attributes or relations. Although databases resemble the archive – or can be said to be a type of archive – they differ significantly from the physical collection of objects and texts that makes up the traditional archive. For one, the ease with which they absorb new data elements and incorporate these in their structure makes them more amenable to change and growth than traditional archives. Ed Folsom emphasizes this when he writes that “[a]rchive suggests physicality, idiosyncratic arrangement, partiality, while database suggests virtuality, endless ordering and reordering, and wholeness.”¹³ Of course the

¹³ Folsom, Ed. “Database as genre: the epic transformation of archives”. *PMLA* 122.5 (2007): 1571-1597; p.1575.



word *suggest* is significant in this sentence – databases are as much restricted by space and human effort as other collections. Nonetheless, the digitization and online availability of both stored objects and storage system means that many online data collections can be accessed and changed from all over the world with unprecedented ease.

The assertion that archives, and by extension databases, can contain multiple stories and a large number of data all at once does not mean that they are objective collections in themselves. It would be naïve to believe that any database can come into being or exist in neutral and unbiased ways, devoid of any narrative influences. Databases are man-made (or man-programmed) artefacts, designed to answer human needs which are inevitably tangled up in narratives. A wide range of stories – e.g. about history, human nature, or science – underlie our construction and use of these digital collections, especially in the Humanities. As Katherine Hayles points out, “database operations say nothing about how data are to be collected or which data should qualify for collection, nor do they indicate how the data should be parsed and categorized;”¹⁴ these decisions are made by humans, in the context of narratives and discourse.

The EUWATHER database is a case in point, as it is embedded in cultural and historical narratives and aims to disseminate this knowledge to a broader public. While the construction of databases can be traced back to narratives, the database in turn allows the user to alter existing or create new narratives, for instance through computation and data mining. Taking this into account, we have tried to diffuse the inevitable bias of the narratives we base our data selection on by working together with different stakeholders, representing different narratives. The stakeholders have provided us with subsets of data which have been incorporated into the main dataset. This means that the dataset as a whole contains these separate stories, but also that elements from these stories could be combined to create new stories. As an example, elements from narratives about the history of fishery on the one hand and of nature conservation on the other (both present in our current dataset) might be recombined into a new narrative taking the perspective of the herring as a point of focalization. If our database is seen as a canon, this could be described as an attempt at “differencing the canon,” to use Griselda Pollock’s words.¹⁵

This ease of (re)combination of objects into novel narratives is facilitated by limiting the hierarchy in the database. Instances in the database are annotated using keywords and metadata fields such as ‘author’ and ‘year of production’ and can of course be

¹⁴ Hayles, p.1605.

¹⁵ Pollock, *Differencing the canon*.



differentiated based on these, but the structure of the database is flat and no one object is more significant than any other. Similarly, although there is a metadata field indicating who contributed a particular instance in the database (for purposes of data verification), this information does not structure the information in a hierarchical way. All objects, regardless of origin or initial narrative, become equally important and available for new storytelling. Furthermore, while the database can currently only be added to and changed by the partners in our consortium, we would like to open it up in the future to a broader audience, allowing an element of crowd sourcing. This way we hope to be able to include cultural objects not currently known or readily available or to us, such as family photos of the reed cutters at work.

The approach has advantages when compared to the collection of narratives, for instance in a book. The addition of new stories to such a collection, as opposed to an archive or database, will keep the elements of these stories locked in their separate, co-existing, narratives. Adding the elements of a new narrative, on the other hand, to an archive like our database, will allow these building blocks of the stories to become separate and take on a life of their own, ready to be combined with different building blocks and be incorporated into new narratives. A family snapshot of reed cutters, originating from a narrative about the family tradition of the trade, might be taken up into a description of the evolution of health regulations in Dutch workplaces, with an ease which is specific to the medium of the database.

Emphasizing the differences between narratives and databases has clarified some of the benefits of uses of the latter as a medium of representation in our project. The database, as a medium, possesses idiosyncratic features that make it suitable for the combination of multiple stories of equal importance, as well as the construction of new stories from the existing set of narrative elements. Now that we have separated the two forms of representation and have focused on their differences, let us bring them back together and look at the possibilities of translation between them.

The database as genre

The idiosyncrasies of the medium of the database, as well as its impact on our representations of the world, have led scholars like Lev Manovich to consider the database the most recent in a string of dominant models of representation, the “new symbolic form of the computer age.”¹⁶ He argues that

¹⁶ Manovich, p.219.



“if after the death of God (Nietzsche [sic]), the end of grand Narratives of Enlightenment (Lyotard), and the arrival of the web (Tim Berners-Lee), the world appears to us as an endless and unstructured collection of images, texts, and other data records, it is only appropriate that we will be moved to model it as a database.”¹⁷

Ed Folsom extends Manovich’s argument and describes the database as “a new genre, the genre of the twenty-first century.”¹⁸ He supports Manovich’s claim that database and narrative are natural enemies.¹⁹

However, this opposition between narrative and database seems rather too strict and other authors have suggested a more nuanced understanding of the interplay between the two forms of representation. Katherine Hayles suggests a new metaphor, which in my opinion better captures the interplay between the two systems: “[r]ather than natural enemies, narrative and database are more appropriately seen as natural symbionts.”²⁰ The database is a powerful tool when it comes to bringing large sets of data objects together in a structured network of relationships. As such it is better able to structure and compute continually growing and changing sets of data than the narrative. But databases are unable to interpret and make sense of these complex clusters of data and relations; they rely on narrative to explain their content. This interplay was an essential part of the construction of the EUWATHER database and design choices were made keeping this symbiotic relationship in mind. Far from being enemies, database and narrative can be made to work together to create meaning.

The two forms of representation complement each other. Where narratives present us with a linear unfolding of events through time, emphasizing the temporal dimension, databases are structured first and foremost in a spatial dimension. A narrative can be created by lifting a set of instances out of a spatially organized database and ordering it in a linear, sequential way. This process is helpfully described by Manovich’s use of the concepts *syntagm* and *paradigm*. When applied to language, for which Ferdinand de Saussure originally introduced these terms, the syntagm refers to the stringing together of elements in a sentence, the choice of building blocks which make up the linear order of the sentence, e.g. article – adjective – noun – verb. For each of these elements a range of different options is available and is chosen from; this, in turn, constitutes the paradigmatic dimension, e.g. all synonyms of a particular word can form a paradigmatic

¹⁷ Manovich, p.219.

¹⁸ Folsom, p.1576.

¹⁹ Manovich, p.225.

²⁰ Hayles, p.1603.



set, all possible verbs can too, etc. If the syntagm is seen as the horizontal unfolding of the sentence, the paradigm would be the vertical columns of options available for each of the elements in the sentence.

Manovich argues that database can be said to correspond to paradigm, while narrative corresponds to syntagm. By selecting one data instance after another from the paradigm of the database, whether they be webpages, menu options or objects in a collection, the user strings together a syntagmatic narrative (a walk through a list of web pages or menu options, or a string of objects from a collection put in a particular order). Here, the difference between traditional, analogue archives and digital databases is again of importance; while selecting objects from a physical archive and ordering them allows the user to create a narrative along this same principle, the ease with which this can be done with a digital (and online) database radically alters the ways in which narratives can be made to 'emerge' from data collections.

It is this interactive use of databases and the freedom it creates in writing (multiple) narratives that forms the driving force behind the EUWATHER project. The spatial dimension of our EUWATHER database is of a particular nature. Like most archives and databases, the ordering of objects in the set is essentially spatial and in parallel, instead of temporal and sequential. All objects exist at the same time, spread out in the (virtual) space of the database. But in addition to this, a second type of spatial dimension has been introduced in the database. All instances have been provided with two sets of geo-coordinates, one indicating the physical location of the actual object (for instance in a museum), the other indicating the location of the artefact, building or landscape represented by the object. A data instance of a painting of a church will therefore contain the location data of the painting as well as those of the depicted church. These geo-coordinates are used to embed the instances of the database in a spatial data infrastructure (SDI), connecting the data based on the location data. This allows the users of the data to visualize the instances in (interactive) maps and to filter by zooming in on regions and villages, (in addition to other filtering operations based on metadata such as type of object, year of production, etc.).

The relevance of this added spatial dimension is best described in terms of syntagm and paradigm. In constructing a tourist itinerary, the unfolding through time of the narrative is directly linked to the movement through space (the city, nature reserve, region) of the itinerary. Sections of the story proceed in tandem with points of interest in the landscape. This characteristic sets the tourist itinerary apart from most other narratives, which lack



this direct conflation of moving through the narrative with moving through physical space. The narrative of the itinerary can be compared to a sentence and can as such be seen as syntagmatic, each of the stops along the way representing a ‘word in the sentence’. The many paths through a region create a multitude of syntagmatic possibilities. These words, in turn, can each be selected from paradigmatic sets, available at each point. This is where the geo-referencing plays a crucial role. In constructing the narrative, the location data at each point of interest in the itinerary narrow the data objects in our database down to a paradigmatic selection tied to that location. Filtering the EUWATHER dataset based on geo-coordinates of a particular spot in the Nieuwkoopse Plassen will, for instance, yield a smaller selection of objects directly tied to that location: landscape paintings created here, tools of reed cutters working here, architectural features of the landscape like water towers etc. This provides the author of the itinerary with a paradigmatic range to choose from in constructing the narrative.

In her introduction to the theory of narrative, Mieke Bal defines a narrative text as “a text in which an agent relates (‘tells’) a story in a particular medium, such as language, imagery, sound, buildings, or a combination thereof.”²¹ The represented story is a particular presentation of a *fabula*, which Bal defines as “a series of logically and chronologically related events that are caused or experienced by actors.”²² A *fabula* consists of the elements of events, actors, time and place which together produce the material of the story. The process of constructing a tourist itinerary from our database can be understood in the following way. The final narrative text is of a particular nature already. It is provided by the smartphone app – which uses traditional media such as text, maps and images to represent the story – but also by landscape features experienced or ‘read’ by the tourist as she makes her way through the landscape. The act of reading is inextricably linked to the act of traveling. Together, these elements of the narrative – textual, visual and experiential – provide the story. This, in turn, consists of the string of paradigmatic choices, made by the author, at each point of interest along the way. The choices might, for instance, reflect a particular theme, an interest in a specific period or the history of a particular group of people. These selected instances in the database, along with the locations of points of interest in the landscape can be seen as *fabula* elements, for the author of the itinerary to put together in a particular order.

²¹ Bal, Mieke. *Narratology. Introduction to the theory of narrative*. Toronto, Buffalo and London: University of Toronto Press, 1997; p.5.

²² Bal, p.5.



By putting our use of geo-coordinates in the perspective of syntagm, paradigm, story and fabula, I hope to have elucidated the relevance of our approach. The unfolding of a story through time takes up special meaning for the tourist itinerary, as it becomes intricately linked to the movement of the tourist through space. Time is not just used within the constructed world of the narrative (for instance the 16th and 17th century of fishery in Enkhuizen) or taken up by the reader in the process of reading the text, but becomes linked to an additional bodily experience of the reader, the act of walking from one point in the narrative to the next. Each move from one element of the fabula to the next comprises the physical move from one point of interest to the next. The importance of the spatial dimension in the database, as described by Manovich, is thus taken to a new level in our database, by ordering the objects not just within the virtual and relative space of the database, but also within the real and absolute space of the represented landscape. This focus on location makes the database an optimal fit with the corresponding narrative type of our project, the tourist itinerary, which is characterized by a direct link between the temporal and spatial unfolding of its story.

Whereas the previous section highlighted some of the differences between the two media, in this section the similarities have been addressed. By putting the translation between the two 'genres' in the context of (a metaphoric use of) syntagm, paradigm and fabula, I hope to have underlined the particular nature of our EUWATHER database. The connection between temporal and spatial dimensions has proven essential to the process of translating between database and narrative and vice versa. In this process of translation, a special role is reserved for participation by users outside our consortium. The final section will therefore provide some thoughts on the implications of audience participation.

The tourist as archivist

Translating narratives into the database and database subsets into new narratives has formed the basis of the EUWATHER project. We explicitly intended to create a body of knowledge that would benefit a broader audience and would allow narratives to be constructed and disseminated, informing the public about the cultural heritage of the landscapes they move through. Tourist itineraries are more than mere commercial entertainment; they can help spread marginalized or novel narratives and make these accessible to people who might not visit the archives or databases on which they are based. As mentioned before, archives need narratives to interpret the information they contain and render this 'legible'. This is arguably even more the case for databases, which



can expand at a rate which far outpaces the speed with which the information can be fully taken in by users. Although digital media come with many benefits for the field of Humanities, there is a danger of 'over-collecting'. Continuously putting small selections from a vast collection into perspective is essential to keep the whole collection active.

Lifting sets of objects out of our EUWATHER database and framing them within tourist itineraries keeps the objects of cultural heritage alive and allows for continuous reinvention of the landscape. To this end, the use of the database by parties outside our consortium is crucial. Increasing the number of narrators who contribute to the project, both by adding objects and by writing narratives, will further diversify the information and the narrative potential of the collection. On a practical note, it is also not feasible for our limited consortium to continue the extension of the project. We are therefore working to provide templates to help users create tourist itineraries from the available data in the database. At the same time, we are looking for ways in which external users can add objects to the database, without too much interference or help from consortium members (both to eliminate bias and to allow the project to be taken over by a broader public). In doing so, the database is gradually transformed from a curated to a semi-curated space. This will hopefully result in a situation in which the audience plays an active role at both ends: adding objects to the database, based on personal and community narratives (input end), as well as parsing the information into novel and/or revised narratives (output end).

This scenario brings us full circle. Throughout the project we have sought to strike a useful balance in paying attention to narrative and database and to fully use the symbiotic relationship between the two. Tourist itineraries can be a powerful tool in disseminating stories that need telling or retelling. Designing a platform which enables external users to collect relevant data and construct itineraries is an important undertaking that stands to gain from a theoretical understanding of the interplay between database and narrative. The EUWATHER project has yielded valuable results, both in its methodological exploration and its practical implementation.



Watery pasts and the constellation of the canal

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Abstract

Heritage trails are an important route into accessing the histories of waterways. They are a multifaceted tourist product, combining a series of complex environmental, economic and cultural policy objectives, and are increasingly used by communities and public agencies as a tool to encourage recreational use along linear corridors. This paper seeks to open a discussion about the use of heritage trails and the processes of heritagisation by thinking about the archival qualities of the canal. It reflects upon research carried out as part of the AHRC-funded 'European Waterways Heritage' project, which (through its UK case study) has produced a new 5km heritage trail for the Ashton Canal in Greater Manchester. The paper considers what happens during a process of historical reconstruction and rehabilitation of cultural heritage when a canal is found to be layered in the unspectacular – lacking any special, historical, technical or aesthetic attributes. Using Walter Benjamin's (1999) concepts of the 'flash' and 'constellation', alongside cultural geographic readings of post-industrial atmospheres, we seek to think with the water and the surrounding built environment of the waterway in a way that suspends an "indexical imaginary" (van Wyck, 2010) and which encourages a deeper embodied engagement with our surroundings, its material and non-material properties, its happenings and incidence. The paper thus has implications for how we write and construct heritage trails, facilitate new user experiences, and deepen forms of public engagement about our watery pasts.

Introduction

In recent decades many millions of pounds have been spent restoring and maintaining Greater Manchester's industrial-age canal network and its towpaths (Inland Waterways Advisory Council (IWAC), 2010). This investment is consistent with a global trend to restore canals and waterfront areas for new uses, particularly to support urban regeneration and renewal, destination development and sustainable tourism (Hazenbergh & Bajwa-Patel, 2014, p. 9; Button and Pearce, 1989; Fallon, 2012; Lennon, 2016; Tang



and Jang, 2010). Though the infrastructure has been rebuilt and even enhanced, with new access points onto the towpath, and resurfaced towpaths to allow cycling and wheelchair access, practical access and infrastructure planning has not always been informed by understandings of minor waterways as unique cultural landscapes (Cosgrove and Daniels 1988; Schama 1995). This is the gap the European Waterways Heritage (EUWATHER) project (2015-2017) was designed to address. The EUWATHER project seeks to promote knowledge and rehabilitation of the unique cultural heritage of minor waterways and historic canals in different European pilot regions, and is driven by the idea that multi-functional heritage deserves a renewed, coordinated commitment to its revaluation, by considering both structural hydraulic artefacts (canals, bridges, weirs, mills, etc.) and their related waterscapes. Its premise therefore is to provide new opportunities for eco-tourism and outdoor recreation as a driver for sustainable development through the identification and publication of resources concerning heritage of minor waterways.

A key output of the project has been the production of specially-designed itineraries, or heritage trails (or 'heritage tours'). In common with heritage trails more generally, they are designed to involve a "sense of a historic journey accompanied by an attractive landscape and built heritage" which provides "a satisfying sense of achievement for the traveller" (Macleod, 2004: 67). Trails are designed to promote sustainable tourism and outdoor recreation via foot, bike or boat. The itineraries rely on the identification of heritage 'assets', covering both the past and present, tangible and intangible, natural and built environment. These include: architectural heritage; landscape features; natural heritage; literature, poetry and song; hydrologic infrastructure; cultural representations; tangible folklore; histories and memories, both oral and written. Each pilot country involved in the EUWATHER project (the Netherlands, Spain, Italy and the UK) has produced itineraries that explore these features; labelling and pinpointing structures related to hydrological engineering, those that support waterborne leisure and commerce, to landscapes that have inspired cultural expression – through art, song, poetry – to networks of canals that play a vital economic and ecological role through irrigation in support of agricultural production, industry and employment. The trails make use of geospatial technologies for managing and promoting cultural heritage to provide residents, tourists and visitors with a deeper understanding of place. The trails feature various layers of detail – stories, oral histories, sound data, photographic and visual resources, textual narrative – which are uploaded to a locative media platform that connects a heritage artefact to a grid referenced (or mapped) point of interest. The locative-aware mobile media application (through the Izi.Travel app <https://izi.travel/en/58bc-waterways-explorer?locale=en>)



allows users to find their position on a map through their smart phones to retrieve information about the artefacts, and to journey on the suggested route of the heritage tour.

The trails did not emerge merely through antiquarian immersion, but represent a methodological process of collection, recording and selective display of heterogeneous historical elements, with details and artefacts collected with (and sometimes by) local communities, entrepreneurs and public agencies. In our case, canal societies, canal preservation groups, and local historians were involved in the co-design of three trails. The project, in particular, has been reliant upon the work of local historians and enthusiasts. These actors place a high value on 'vernacular' heritage resources and take seriously the histories, memories and the material culture of a place (Gilchrist, 2016). The trails have between 12 and 20 points of interest (POIs), depending on length. These reflect a geospatially referenced 'object' (asset/artefact) that forms part of a heritage tour. Through participatory workshops and field walking methods with local groups and enthusiasts a number of POIs were developed collaboratively (Gilchrist, 2016), giving the community ownership over the heritage itineraries. In our case – working with groups on the Rochdale and Ashton Canals in Greater Manchester (the Canal and Rivers Trust, the Ancoats Canal Project, the Wooden Boat Preservation Society), we were able to design routes that met the strategic needs of these organisations; to encourage visitors, tourists and volunteers to the canals, as well as raising community awareness in local heritage. Even though some of these groups have developed their own (now out-of-date) heritage trails of the waterways and the surrounding environment, these served to orient and sharpen particular narratives that could be fashioned that told alternate stories, making use of common POIs where relevant, though extending the range of possible heritage artefacts and assets known locally through archival searches undertaken by the academic team. In these respects we recognised that the heritage trails are ephemeral and temporary cultural products; useful for raising consciousness of the historic value of a neglected site, and meeting wider strategic needs in promoting opportunities for sustainable tourism. But they will necessarily be modified and eclipsed over time, according to different needs and priorities.

Identifying canal heritage assets and itineraries

The initial survey of the Rochdale and Ashton Canals for heritage 'assets' revealed a variety of potential cultural resources that could be entered into the central spatial database inventory. These vary according to location along the linear path of the canal and when collected together suggest different thematic emphases that might be pursued.



For example, a literary tourism trail was considered. Mytholmroyd on Rochdale Canal exploits connection with former Poet Laureate Ted Hughes (1930-1998). Interpretation panels at the railway station provide information about Hughes and fragments of his poetry related to the local area. New artwork inspired by Hughes' poetry can be found on the towpath, which encourages walkers onto and off the canal towpath at selected points. This initiative is seeking to encourage literary tourism, by making the most of available literary and biographic links. Hughes was born and raised in the area; he roamed Mytholmroyd and its surroundings during his childhood. You can find a plaque to his birthplace. But the 'asset' is relatively tenuous; it is a "precarious fiction" (North, 2009: 59) that rests on a local claim to authenticity through which we can encounter the life of the writer. But it is not a story about the Rochdale Canal per se.

In denser urban areas the range of heritage assets and stories that could be told about the canal increase, but this carries other issues in terms of historical and heritage interpretation. Let's consider the layers of urban history as the canal enters central Manchester. The Rochdale Canal runs for 32 miles (51 km) across the Pennine Hills from the Bridgewater Canal at Castlefield Basin in Manchester to join the Calder and Hebble Navigation at Sowerby Bridge in West Yorkshire. In Manchester it passes through the Ancoats area, considered the 'world's first industrial suburb' and is firmly associated with the cotton mills and warehouses of Victorian industrial Manchester (Rose et al, 2011; Blakeley and Evans, 2013), and Asa Briggs's famous depiction of Manchester as the 'shock city' of the Industrial Revolution. The history of the canal intersects with the urban history of Ancoats and Manchester. Writers and historians have found a rich seam in the imagery of the working poor that were once found in this environment; no doubt a task supported by the international fame of Friedrich Engels' *The Condition of the Working Class in England* (1845), which solidified a set of images of the poor social and housing conditions of the very poor, living in other parts of Manchester and Salford, but whose lives were reflected in other industrialising cities. To these sets of images we may layer histories of the communities that abutted the canals, living in the backstreets bisecting the Rochdale Canal. We can include stories of the street gangs ('scuttlers') of Ancoats, a dark underworld of masculine bravado and violence as youths engaged in turf wars during the late nineteenth century (Davies, 2011). A further layer of cultural meaning is present in the identification of Ancoats as 'Little Italy' on account of its sizeable Italian migrant community and presence of ice-cream factories. This is a history which complicates simple stories of the formation of the British working class, taking into account the formation too of a European ethnoscape and the creation of diasporic communities through family and work (Rea, 1988; Taylor, 2000). The canal network once weaved its



way through these communities, supporting industry and employment for tens of thousands of people. A narrative could then be fashioned on the history of the canal in relation to Manchester's urban and commercial development.

If the neighbourhoods of East Manchester are firmly set within a Victorian cultural imaginary, then the Rochdale Canal in the city centre offers a different set of geographic imaginaries to showcase. The canal here runs through an area more closely imagined and labelled as a 'queer space'. Canal Street is the home of Manchester's gay community (Quilley, 1997; Hindle, 2000; Skeggs et al, 2004) and is marketed as a gay tourism destination (Hughes, 2003). Canal Street sits within a queer imaginary as a cosmopolitan, inclusive, safe space – and one linked to Manchester's post-industrial transformation, nighttime economy, and growth as a creative city. Popular television programmes such as *Queer as Folk* have provided representations that draw upon known qualities and experience of place, but as a series of representations they actively constitute the city (Skeggs et al, 2004: 1841; Sennett, 1991) becoming a plausible and intelligible way of making the city known and knowable. As Marback et al, propose: "When you hear or read about a particular city, almost automatically you draw upon what you have previously heard or read about that city to judge what you are hearing or reading now" (Marback et al, 1998: 3). The Rochdale Canal of Canal Street – a pedestrianised thoroughfare where the canal bank is framed by Victorian red-brick warehouses – contains histories related to the emergence and growth of Manchester's gay community, including local authority policies and strategies that attempted to create dynamic spaces of difference in line with New Labour's investment in culture-led regeneration, and subsequent urban gentrification (Skeggs et al, 2004: 1842). It is a space of freedom, escape, liberation – and freedom from gay victimhood and violence – and one in which we can begin to know Manchester in the new Millennium.

The Rochdale and Ashton Canals of East Manchester in the present day continue the story of a landscape reshaped by social and cultural change and the intervention of public agencies. The Ancoats and East Manchester areas have been transformed in the last two decades through public investment and Middle Eastern capital. The waterfront has been transformed into a new amenity for the city and its visitors. A new canal basin – 'Cottonfields' or the New Islington Marina – provides berths for up to 30 narrowboats, though is built on a site that was once a residential housing estate and previously a factory district. Urban policies have been designed to seek families with greater levels of social capital and higher incomes and the area is undeniably going through a process of managed gentrification (Blakeley and Evans, 2009; Young et al, 2006; Mace et al, 2007). Many buildings – public baths and public houses, old warehouses, wharfs and canal arms



– have been lost to the ‘progress’ of late twentieth century urban planning and development. It is arguably the case that the canals are playing a rather orthodox role in property-led waterfront development; a role for waterways and port areas that is common to numerous other urban districts worldwide.

We use these examples to help establish the central question of this paper – what is the constellation of the canal? How can we know a canal? What are the possible identifiable historic and heritage assets and artefacts that go into the making of a waterway from which it is possible to develop itineraries, heritage trails and tours? The linear passing of a waterway through time and space gives rise to multiple interpretative emphases. Given Greater Manchester’s diverse histories it may not be possible to tell a single story of the canal, but in fashioning this story to what degree must we make sense of the canal *sui generis* (on its own terms) or the canal made sense of in terms of intersections and relations with urban and rural environments, processes and histories? What we are seeking to achieve in this paper, therefore, is to open a series of ontological and epistemological questions about what constitutes a ‘watery past’ for a canal and waterway network. This paper offers reflections upon how in telling heritage stories about waterscapes we need to interact with other mediations and identities of space and place, and the complex temporalities, materialities, spaces and scales of the canal itself that may coalesce into a collaborative story about the waterway. We offer reflections about the tools available to reach for historians and heritage professional seeking to create insights into a neglected heritage asset, in ways that do justice to the material and non-material assets, relations and actors of the waterway and its surroundings. For the purposes of this paper, we limit our focus to the Ashton Canal, a 9km route from central Manchester to Ashton-under-Lyne. The paper proceeds by outlining our ‘Stones and Boulders’ trail for the Ashton Canal and then presenting some points for discussion about the archival properties of a canal, informed by Walter Benjamin’s concepts of ‘flash’ and ‘constellation’, which help us to think about the process of storytelling, the narrative events and “angles of vision” possible on minor waterways.

Case Study: Ashton Canal stones and boulders trail

The surface impression of ‘reading’ the buildings, structures and material remnants along the Ashton Canal is that this is an urban environment that is unspectacular. Whereas the other canals in the EUWATHER project possess structures that feed into established visitor perceptions of their regional cultural landscapes (Palladian-style villas in the Veneto; tulip-lined polder, windmills and boathouses in North Holland), the architectural aesthetic on the Ashton Canal is crushingly drab; replete with abandoned red-bricked



mills, warehouses and decaying industrial units; the “redundant spaces” of left-behind economic infrastructure (Clarke, 2008). This is not to say that the landscape of Greater Manchester has no value or cultural merit. Artists such as L.S. Lowry (1887-1976) and his mentor Pierre Adolphe Valette (1876-1942) were inspired by this environment and sought to record its buildings and form, people and their daily activities. Where Lowry captured the anonymous mass hurrying to work through narrow street and canal towpath, Vallette’s impressionist strokes depicted the atmosphere of the Industrial North, the surfaces of buildings obscured by smoke and a damp foggy. Their images, as available cultural artefacts, help to reify the reputation of Manchester as a ‘shock city’ of the Industrial Revolution (Briggs, 1965). Yet, the canalside architecture present today does not play into imagery of a ‘typical’ British landscape - though there could certainly be claims about it feeding into Northern English identity and cultural heritage. As such, its touristic value is limited, arguably only for the niche market of industrial heritage tourism and the parochial interest of local history. There are other grounds in which to be more optimistic concerning the re-valuation of this environment. Human geographers have recently reconsidered ruin spaces as part of the enduring representational devices of the western tradition (DeSilvey and Edensor, 2013; Pikner, 2014), with industrial buildings and sites now provoking insights into the dynamic material and non-material processes that make place (DeSilvey, 2017).

Thus, whilst a surface impression is that the abandoned building is a waste product of the shift to a post-industrial economy, and generally of little classificatory value, journeying to and through ruins can excite new discoveries and an appreciation of local vernacular ecologies now seen as important to evolving and multiple forms of post-industrial transformation. As Pikner (2014: 86) notes,

“the visual appearance may hide some embedded ongoing processes and capacities related to the ruins. The ruins are therefore not interesting as such but as an obliteration, an absence of stable form and a presence of a void. Ruins and ruination can illuminate the structures, and the processes of organizing that often involves many bodies and entities.”

Whilst the Ashton Canalside is unspectacular, un-cherished and under-valued compared to major urban canals across Europe (in particular next to those found in Venice and Amsterdam – The Grand Canal or Amsterdam Canal Belt), nevertheless, it is an environment with a material fluidity and a story to tell. During the length of the project we have witnessed warehouses being turned to rubble, sites scraped over for brownfield redevelopment, paths and roads removed, and buildings in various states of decay.



There are no assurances that the material record entered into our archival database and into our heritage trail route will remain there for the visitor. The space is in flux. The points of connection are threatened with obsolescence. Navigation may be restored but the view from the water, over time, is one of demolition, replacement, renovation and reconstruction as buildings come and go. To quote Karl Marx, “All that is solid melts into air”. A challenge has been to appreciate the material fluidity that characterises the immediate built environment of the waterway (DeSilvey, 2017). We have recognised how the urban environment is constantly being repurposed and rebuilt. As Tim Edensor observes, buildings “are subject to endless recontextualization and adaptation, dependent upon prevailing aesthetics, political ideologies and religious imperatives, technologies and interpretations of history” (Edensor, 2013, p.447). Following from this then, there are opportunities to narrate how the canal, its hydrological infrastructure and surrounding built environment, has been subject to changing aesthetical tastes, functions, and uses, recognising that the canal and its immediate observable landscape is always in a fluid process of becoming.

In this respect, we were transfixed by the unfolding state of ruin of the Ashton Canal and in particular its “stony materiality” (Edensor, 2013). Stones, lumps of concrete, bricks – they don’t always look like much, but they have a story behind them. The more you look into the local area’s history, the more you see stone everywhere, from the limestone transported from Prince’s Dock to the slates on the roofs and the cobbles beneath your feet. We chose stone as an element in understanding the city’s ever-changing temporal collage (Edensor, 2013). The points of interest developed for the heritage trail on the Ashton Canal were themed around stone. We sought out these features in an attempt to enrich our everyday apprehension of the canal, avoiding “a narrative that reifies place-identity, but which honours the host of human and non-human agents that continuously make, re-make, interact and engage with urban materiality” (Edensor, 2013: 448). The properties of stone, we felt, tell stories about why they have come to be, placed in situ, or worked in a particular environment. They harbour stories of how a material surface came to be, as well as opening questions about the social and economic relations of material objects (Tilley, 2007: 17), and the emotive and sensuous connections and relations people have had with materials (Ingold, 2007).

The ‘Stones and Boulders’ trail we co-designed for the Ashton Canal (<https://waterwaysheritage.wordpress.com/2017/03/29/donkey-stones-and-boulders/>) thus sought to make something out of a vital urban materiality. We wanted to shed light on this ubiquitous material asset in order to offer something different to our understanding of the heritage of waterways and the choices that are made in the process of re-valuing



or rediscovering heritage assets. To a large extent, this was born from necessity. Initially we went in search of tangible cultural heritage, as our European colleagues had done. We were keen to find drawings, prints, paintings, sculpture, poetry and song that told the story of the canal's cultural landscape. However, faced with intractable issues over gaining copyright permission to use the images and texts we found, let alone locating plausible historic artefacts, we had to shift tack; to begin to look anew at other possible stories to be told from the local environment. The process was an object lesson in the premises of a cross-European research project and the commensurability of method.

The “stony materiality” of the Ashton Canal brought into focus an assemblage of different material elements. Points of interest on our trail include the Ashton Packet Boat Company boat house in Droylsden. What is now a children's canoe centre, near the junction with Droylsden Marina, was once the boat house of the Ashton Packet Boat Company. The building is made of hammer dressed stone and the roof is slate. According to its datestone it was built in 1833. Though we tend to think of canals transporting heavy goods for industry, the Packet Boat Company ran a passenger boat for many years. Indeed before the railways, there was a regular passenger service from Ashton to Manchester. The canal was a good, fast way to get people from one town to another. So, the inclusion of this building helps us to understand the canal's diverse transport types, the growth of new consumer markets and the need for populations to move, for work and leisure. Across the water from the packet boat house you can see low stone walls marking the boundary of the towpath and the land of the Fairfield Moravian Settlement in Droylsden. Beginning in the 15th century, the Moravian church is one of the earliest Protestant churches. The Fairfield settlement was built in the 18th century as a planned village. It has its own schools, shops, farm, fire-engine and doctor, for example. Today the settlement is still there, though there have been changes over the years. Manchester Art Gallery has two paintings of the settlement, probably from the late 18th century. You can see how rural the setting was by viewing the paintings, but a look at satellite images today will reveal the same characteristic layout of buildings.

Other buildings and protrusions remain. At Fairfield Junction there is a private lockside cottage. This was originally built for the canal agent. Adjoining it is a small tollhouse, where people would pay to use the canal, at its junction with the Hollington Branch. The long low boathouse – now used by the Children's Water Adventure Company - used to be the boathouse of the Ashton Packet Boat Company, which ran a busy passenger service from Ashton to Manchester, at a time when the roads were poor.



The canal is lined with many lumps and bumps of concrete and brick left behind when uses for the canal changed. By the boatyard of the Ashton Packet Boat Company there's a large block of concrete, which serves no obvious purpose, but was connected to the Ashton Moss Colliery, or otherwise known as the Snipe Pit, which mined the south east corner of the Lancashire coalfield. The Ashton Moss Colliery was opened in 1875 as demand for coal in the region grew, and had its own railway branch and canal arm for the easy transportation of coal, with coal loaded onto boats using a big overhead gantry. The gantry is gone but what remains is the big block of concrete that used to support it. In 1882 a second shaft was sunk, which at 2,850 feet, was the deepest in the world at the time. The pit closed in 1959. Until it ceased production in the 1950s, 150,000 tonnes of coal were being dug out here every year. Prince's Dock, which served a small canal-railway interchange, is where limestone was loaded onto railway wagons. You'd hardly know now but for the fact that as you walk along the canal towpath, you find yourself walking up over a bridge, just near Oxford Mill. This bridge went over the arm of the canal going into the docks.

At Lower Wharf Street in Ashton can be found Eli Whalley's Donkey Stone Factory. A blue plaque erected on a building marks the spot. Donkey stones were a kind of soft artificial stone made from reconstituted stone powder. They were part of the everyday life of Lancashire mill towns; used to clean and apply a temporary coloured surface to doorsteps and sometimes also window sills and pavements. The Eli Whalley factory was founded in the 1890s. It produced 2.5m donkey stones a year at its peak. It was the last place in country to manufacture donkey stones when it closed in 1979.

A short detour to the churchyard of St Peter's Churchyard in Ashton, places the visitor in the vicinity of the Boulton Boulder [sic], a large boulder, where bears the following inscription:

This Boulder
was placed here by
Alderman Isaac Watt Boulton MP
of Stamford House Ashton under Lyme
in affectionate remembrance of
his eldest son
Thomas Boulton
who was for 9 years warden of this church
Born November 5th 1841
and died at sea February 5th 1880



on board the R.M.S.S Kinpauns Castle
wherest on a voyage to the Cape of Good Hope
to recruit his health
his remains were committed to the deep
in Lat.11.30 South Long.2.30 West, February 8th 1880
Lord have mercy on my soul
and take me to thee.

The memorial consists of a huge glacial boulder, weighing four tons, which was discovered during excavations in the area. Mr Isaac Watt Boulton acquired the boulder and placed it on an ashlar pedestal as a memorial to his lost son. Engraved upon the boulder are traces of lives. The inscription reveals the emotional trauma of loss of a valued family member as well as clues to British social history. The details of Thomas' voyage to the Cape of Good Hope present the high watermark of British imperialism, with cargo vessels plying the route to colonial cities. The memorial provides a clue also to sites of therapy and recovery, perhaps from illnesses and ailments associated with urban living in places like Greater Manchester. The names of the Boulton family themselves are associated with the industrial history of Ashton. Isaac Walton's father, John Boulton, for a time had a successful horse-drawn passenger boat business, taking advantage in the gaps in the transport web left by the opening of railway lines in the region (Bennett, 1971). Isaac Walton became a locomotive manufacturer and, as founder of Boulton's Siding at Ashton-under-Lyne, had a successful locomotive hire business. The Boulton's were a family intimately connected to the evolution of nineteenth century transport in the Greater Manchester region. The history of the boulder also bears other, now forgotten, histories. The boulder was subject to damage shortly after its erection, with a dynamite charge destroying part of the base. It is insinuated that this was the work of disgruntled trade unionists, which Boulton despised having never allowed a member in his workshops (Bennett, 1971).

The stones on the Ashton Canal trail invite reflection on the geological properties of the materials that have made the area, and from this the social and economic histories that have shaped how they have come to be. As these examples show, there are layers of cultural meaning marked, etched, inscribed, deposited on stones which form important stories about the canal and its development.



Discussion: the constellation of the canal

Presenting the ‘stony materiality’ and remaining material fragments of the Ashton Canal addresses a conundrum we have faced throughout the project: how can we know a canal? What are its identifiable properties which can be recorded as ‘assets’ and which subsequently contribute to our understanding of the disappearing heritage of a minor inland waterway? This is a question which has been taken up by Peter Van Wyck. In his essay, ‘Footbridge at Atwater: A Chorographic Inventory of Effects’, van Wyck proposes that the mapping of a waterway’s hydrotechnic infrastructure is only a partial perspective (van Wyck, 2013, p.262). The waterway’s changing materiality, its entanglement with a host of relations and actors – engineers, industry, government, riparian ownership – can afford a narrative of the canal as a “technological system” governed by an “environmental regime” (Pritchard, 2011) within an urban political ecology. A focus on sociomaterial relations can capture the material flow of resources and how a waterway becomes an object of social and political action, composed of and configured by “artifacts, practices, people, institutions, and ecologies” (Pritchard, 2011, p.19).

Van Wyck then lends another set of thoughts:

“From the bridge, the territorial archive is but a conjecture. The water below, as water, reflects the sky above (incidence), not the archive below (incidents). But this is only partially about the visible to begin with. The archive of toxicity is only ever legible, and only then aided by multiple literacies and actors – from benthic organisms, macrophytes and mammals, to biochemical transactions and curious academics. Another bridge, then, is required; a conceptual and hermeneutic bridge between the metropolitan archives and the territorial indices – inscriptions, traces, florescences and absences. A reader, then, am I of this dilatory place, sifting and gleaning through the remains. In other words, the movement is not from archive to site – the indexical imaginary – but to see the site as archive, dispersed as it is” (Van Wyck, 2013, p.263)

Three points can be pulled from this paragraph. Firstly, van Wyck sets up a distinction here between what is knowable from the archive and what is knowable through experience. A conceptual, theoretical and interpretative framework - through creating ‘points of interest’, labelling artefacts as heritage and categorising tangible and intangible cultural assets – can be achieved through desk-based study. The process of interpretation is essential to understanding the meaningful relationships between people and things in particular places, as a basis to compare and contrast between the material



properties and relations to be found on other waterways (Tilley, 2007). The historian or heritage professional thus invites the public to consider the semiological coherence of materials, with the index or category indicating the authenticity and tangibility of things (the 'indexical imaginary'). This can be born from a desire for referentiality, to record and have certainty, indicating reliable, trustworthy and authentic sites for a person to consume (Doane, 2007). Critical interpretive histories of waterways and water bodies add a post-empiricist intellectual agenda to objects through helping to identify the ideological milieu, socio-natural relations and political-economic contexts of waterways, taking account of the material practices involved in their construction, the processes of modernisation (and modernity) driving the engineering, landscape transformation and reconfigured relationships between nature, resource and city; and their cultural identities, aesthetics and symbolism to locality, region and nation; the modernising desires cut into landscape, if you will (Brannstrom, 1995; Cosgrove et al., 1996; Keiner, 2016). Yet, following C.S. Peirce's theory of categories, van Wyck argues there is a world beyond brute facts (or even interpretation); people encounter the world pre-symbolically and apprehend resemblance and form, where the semiotic coherence and thus capacity for testimony of an object may be in flux (van Wyck, 2013). What this means is that we can encounter a place without necessarily having understood it.

Secondly, the archives are plural. The waterway is composed of many actors, human and non-human, and subject to processes and transactions that shape and reshape what there is to know. Stories can be fabricated from the cultural artefacts that remain; artefacts waiting to be found, recorded, categorised, interpreted, publicised. However, lurking beneath the water are alternate narrative possibilities; the hidden layers of history to be found in the small grains of contaminated sediment at the bottom of the canal that speak of an "archive of toxicity" if probed or disturbed. A "stony materiality" at the micro scale. The interpretive possibilities of bringing alternate materials and materialities into view is that it opens up space to write nonlinear histories of waterways, accounting for the variances in material decay and the nonlinear, cyclical, delayed or slow effects of entropy on people, object and environment (see Brettell, 2016). Brettell, for instance, writes of the boats to be found on the Severn Estuary, their "crab-like hulks...creeping with entropy. Simultaneously they accumulate, gather, and generate new grounds, while gently, slightly, steadily, decomposing and decaying" (Brettell, 2016: 414). Like the buildings, stones and stonework to be found along the Ashton Canal, these things are subject to entropic and elemental processes. An openness to plurality can therefore afford or give licence to new narratives at particular moments; foregrounding the attuned waterway explorer to consider a full range of incidence and incidents.



The third and related point to glean from van Wyck is that the material environment is not set in stone; it's dynamic. There are things that can be encountered and apprehended but they are being acted upon; their material form warped, twisted, eroded, and rusted into new shapes, forms and configurations. Cultural geographers such as Caitlin DeSilvey (2006, 2017) have begun to alert us to the interpretative possibilities of living with entropy, finding value in the processes of decay and decomposition, and taking heart that if we learn to live with this process that other memories and histories will be mobilised in time. A view on entropy thus invites stories relating to the political-economic processes of urban change as well as the presence of non-human agents in making materials mutable. Materials and materiality affords narratives upon which a canal heritage tour can be based.²³

Stone is transformed through its contact with other human and non-human agents and processes. It has a “material mutability” (Edensor, 2013) which reflects its geological origins, geomorphological transformation, and its long history from quarry to place. Stone becomes a constituent part of a built assemblage, but is then eroded by human, organic, chemical, meteorological inputs. There are complex temporalities at play. Edensor – also focusing on the Manchester area - writes persuasively about the relational geographies and complex, connective, flows, networks and scales of stone. “Thus, a stone in a building is forever in formation, shedding its previous incarnations as it becomes repositioned and resituated within a host of changing co-constituents and agencies. These material properties and capacities, changing connections, and the effects of multiple agencies can be tracked to reveal historical depth...” (Edensor, 2013: 449). Stones acquire variable temporalities and materialities as they move, are shaped and come to rest at particular sites. They are witness to tangled and intricate histories.

²³ Following Ingold (2007), artefacts in and of themselves only tell some of the story. Weather, light, rain, mist, fog, shadow, puddles, wind, are also part of the material world and in particular have impacted on how we make sense of stone as part of a wider built environment. Human have played a part in the positioning of the “stony materiality”, and in the processes that led to where they were and how they are. Drawing on James Gibson’s delineation of different kinds of materials in *The Ecological Approach to Visual Perception* (1979), Ingold makes the case that medium, substances and surfaces matter when things about material. Medium includes air, light, radiant light, vibration, sight, hearing, smell – with air key to movement of senses and hence ecological perception. Substances include rock, gravel, sand, soil, mud, wood, concrete – the physical foundations. Surfaces are “where most of the action is” (Gibson, 1979: 23). Ingold writes, “Surfaces are where radiant energy is reflected or absorbed, where vibrations are passed to the medium, where vaporization or diffusion into the medium can occur, and what our bodies come up against in touch” (Ingold, 2007: 5). Surfaces are the interfaces between materials. Viewed through these foundations of perception, then, there is much to understand.



Affording encounters with entropic heritage

The question about how you story the “entropic heritage” (DeSilvey, 2006, 2017) of mutable materials and a transforming landscape put us in search of concepts and metaphors to understand the process in which a narrative can form to tell an alternate history beyond histories already told and recounted about waterways. We sought through our trail a narrative that does not give primacy to discrete events or prominent individuals, but to mutability, material and materiality (DeSilvey, 2017). We were not concerned with mediating or remediating what already existed – or the well-known cultural representations of Manchester as we outlined earlier in the paper; representations that frequently fill the itineraries of heritage tour guides working in the area - but in fashioning, with our community partners and informants, a narrative that moved from the “salvage work” of historical contextualisation (Hall, 1988, p.73), to one that pointed to different connections between people and environment through the various artefacts available to us (Gilchrist et al., 2015). In effect, we sought not to enhance and confirm dominant narratives, but through a process of “antithetical accretion” (Dwyer, 2004: 421), to establish new meanings that could contradict or challenge conventional messages about canal heritage. In concerning ourselves with the ontology of a canal – what can be recorded as an ‘asset’ or ‘point of interest’ - and the epistemology – how we can get to know the waterway, we were drawn to the work of Walter Benjamin, who in his essay *The Storyteller*, recognised the radical interdependency between narrated events and narrative events. He stated: “The storyteller takes what he tells from experience – his own or that reported by others. And he in turn makes in the experience of those who are listening to his tale” (Benjamin, 1999a: 87). Establishing ‘points of interest’ provides an “angle of vision”, to coin Benjamin again (1999a: 83), which shares information different to that previously signified, but this is only one part of storytelling: we need to think carefully too about how the story is communicated and experienced, to consider the “weaving and spinning” (or spiralling!) that occurs when stories are listened to (Benjamin, 1999a: 91).

The movement from text to action is mirrored by the interest shown by cultural geographers in trails and walks as performative mappings of landscape (see Brettell, 2016; Dawney, 2013; MacPherson, 2016). They have shown how we are humanly and physically involved in making sense of the world through creatively and actively working our stories and histories through routes that provide new knowledge and understanding, fusing our apprehension of place physical remainders and ghostly reminders (spectres) of the past (McCormack, 2010; Wiley, 2010). Benjamin’s words are useful here as a



theoretical frame for locating heritage trails within a tradition of storytelling; shifting the terrain away from what is ‘heritage’ and where is trailed to how the processes of heritagisation, the making of heritage and the plotting of trails, and the experience of telling and listening, feed into the experience of storytelling as part of the rediscovery and revaluation of place. In this sense then the heritage trail is not simply an achievable project deliverable but a pedagogic public space, a classroom, through which people are led and allowed to discover connections at their own pace and in their own way (see Ingold and Vergunst, 2008: 5). Peterle and Visentin (2016) coin the term ‘liquid chronotope’ to describe the ways in which a waterway affords narrative emplotment and empowers agency, steering geographical observations through a process of disclosing geographical information as our eye is drawn to signature features (e.g. hydrological structures, constitutive landmarks) whilst at the same time giving the wanderer (waterway explorer) agency to consider the here and there, past and present, similarity and difference. For Peterle and Visentin, the River Po, their case study, is “a water landmark that influences the landscape configuration, and its socio-economical organisation; on a narrative level, the river’s ‘liquidity’, its uncertain fluid essence, affects the writer’s wavering gaze, and his drifting narrative voice” (Peterle and Visentin, 2016: 474). We return then to the meshing of incidents and incidence, experience and essence, set out by van Wyck.

In thinking through the slippage between reference points and physical experience that the heritage trail affords we want to think more about what is produced when people are invited to come into contact with unfamiliar environments replete with entropic heritage, with shifting materials and new materialities, as they make their way along a trail. A further Benjamin concept is useful here for thinking about how insights and knowledge builds in the environment, through movement and connections to stories: the constellation. The metaphor of the constellation has appeared in the work of a number of cultural thinkers (e.g. Walter Benjamin, Theodor Adorno, George Agamben) (see Friesen, 2016). For Walter Benjamin the ‘constellation’ is a conceptual tool and critical epistemological metaphor that helps us to think about the connections between the material and ideational. A ‘constellation’ helps historians to connect the materially ephemeral to a broader system of ideas and through their configuration, as stars in the night sky, meaning and recognition, becomes apparent. Nevertheless, Benjamin argued that the constellation could also be disruptive and dialectical. In his ‘Convolute N’ in the *Arcades Project* (*Passequenwerk*), which deals with historical method and his analysis of that method, Benjamin presents dialectical images as a means to awake a consciousness from slumber. The dialectical image could produce “lightning flashes” of knowledge sufficient to jolt the subject. The lightning flash escapes us, but it creates an impression,



a resonance, a connection. A specific epistemology begins to emerge. For Benjamin the flash of the image creates an instantaneous insight, an epiphany, providing access to history, memory and culture. He wrote in an oft-cited passage from the *Arcades Project*, “In the fields with which we are concerned, knowledge comes only flashlike. The text is the long roll of thunder that follows” (Benjamin, 1999b: 456). A latency is present between the flash of insight and conscious reflection (Weigel, 2015). And yet, we can see that the knowledge is embodied. The flash penetrates the eye, it enters the body and is worked upon to create knowledge. “It is not that what is past casts its light on what is present....Rather, image is that wherein what has been comes together in a flash with the now to form a constellation. In other words, image is dialectics at a standstill” (Benjamin, 1999b: 462). This makes us think less about heritage trails as a linear path of cognition, where with every step we gain in a teleological way further insight into a history. Rather, the knowledge is decentred to the elements.

To a degree these thoughts coincide with a post-empiricist intellectual agenda concerning materiality, one that attempts to foreground experience, consciousness and atmosphere as a mode of thinking and way of knowing figured around a sudden flash (an image, a touch, a sound, a feeling) that grabs our attention and which gradually becomes solidified into a new constellation of knowing (see Behrendt on sound walks). The ‘points of interest’ thus act as focal points for critical reflections on space, materials and materiality, recognising too that they carry affective characteristics which are involved in the process of memory and the experience of place. Consider, for instance, how we encounter stone on the trail in different weathers, in different light conditions, sometimes haptic other times at a distance. Consider how the trail works as a whole to produce understanding. We move past the ‘cultural atmosphere’ of the Northern canal, as rendered by Lowry and Valette, to its moods as a landscape of post-industrial ruination and transformation, and may become transfixed on a particular element on the trail: a boulder in a churchyard and its atmosphere of mourning. Viewed in this light the microgeographies of the elements that compose a heritage trail are significant for they (should) inspire reflection on presence and significance, past and present, permanence and entropy.

As Benjamin highlighted, there is a dialectical and pedagogical role being played in setting the eye before a constellation. The historian’s or geographer’s task for this project, we reiterate, is not the work of antiquarian immersion or reconstruction, but the collection and juxtaposition of heterogeneous elements. It is, to follow Sigfried Giedeon, who extended the idea of ‘constellation’, to “establish constellations” through a kind of atemporal lucidity, which, Giedeon explains, is “ever tied to the fragment [with] the known facts...scattered...like stars across the firmament” (1948, pp.2-3).



He writes:

“The meaning of history arises in the *uncovering* of relationships. That is why the writing of history has less to do with facts as such than with their relations. These relations will vary with the shifting point of view, for, like constellations of stars, they are ceaselessly in change. Every true historical image is based on relationship, appearing in the historian’s choice from among the fullness of events, a choice that varies with the century and often with the decade, just as paintings differ in subject, technique, and psychic content” (1948, pp.2-3).

Whilst we initially found the environment unspectacular, ugly even, we were struck by the constellation that was emerging during the time of the project. We were struck by the repeated patterns – the warehouses, their entropy and removal and the material fragments that retain a connection to the past. We were bewitched by the seemingly unceasing process of erasure and transformation. The “constellation of the canal” was not always visible, but there were knowable elements – things (materials, assets, tangible heritage, representations) through which it was possible to know the space, however limited or unsatisfying such knowledge may be to the antiquarian.

In this sense the metaphor of the observer looking at a constellation in the sky is enlightening, for it encourages us to think about the practices of looking and knowing, the excitement of a sudden flash in the night sky, and how we may build familiarity with a space through studied and careful observation, guided perhaps by an expert hand behind the telescope. Following Paton (2013), we argue that one of the key lessons from the EUWATHER project is to go beyond the archives, to think closely about the relationship between materials, materiality and knowledge in place, and the medium of the heritage trail in producing knowledge and understanding. Paton argues that to know objects requires an emotive engagement and physical presence:

“objects are hard without that familiarity, for they are just stuff over there, doing their own thing, impenetrable. These exteriorated objects are in a revolving isolated present from which one can merely rebound, pinball like, unless one is prepared to spend time with them, have them move through you and shape a growing lifeworld” (Paton, 2013: p.1076).

So, objects may have archival qualities, but familiarity as an accumulation of bodily knowledge through sensuous engagement with an environment, matters. This leads to our final point. The process of heritagisation in the construction of heritage trails goes beyond an archivist’s priority of categorising and arranging – digitally or otherwise – static



objects for public education. That we produced trails for strategic purposes, to encourage people onto the water and towpaths, to get to know their watery pasts and the 'constellation of the canal', presupposed that we were also thinking about the sensuous and pedagogic relationships involved in the meeting of people, artefact (asset, object, material), landscape and place. What we know of a canal and its narratives, its narrative events, is bounded by the waterway which acts as a linear reference point to plot a narrative and guide a journey (Peterle and Visentin, 2016). But *how* we know a canal cannot be preordained; when knowledge and understanding is devolved to material elements the role of the storyteller is unsettled: the visitor may be staring at the night sky and tracing the pattern of a constellation only for their view to be dazzled by a 'flash'.

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Young et al, 2006



Geo-based technology in support of creating a seamless free-choice learning experience on minor water-heritage sites. Lessons learned from the EUWATHER project

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Abstract

Tourism has the potential to persuade people to adopt pro-environmental principles and practices. Nature-based tourism, or ecotourism, particularly aims to influence tourists' behaviour in their home environments by offering a free-choice environmental learning experience. The academic body of literature on the impact of ecotourism practices on cognition, attitudes, and behaviours of tourists confirms the positive correlation between travel and learning. However, the permanence of free-choice environmental learning experiences has been hotly debated. Scholars question the long-term effects of ecotourism on the pro-environmental attitudes and behaviours of tourists²⁴. We argue that geo-based technologies provide multiple opportunities for encouraging knowledge acquisition and experiences on ecological landscapes. These technologies can, if employed in a well-organised manner, contribute to a seamless free-choice learning environment, and as such, to a better understanding and appreciation for nature and local culture. The ecotourism project European Water Heritage (EU.WAT.HER) investigates how the use of geo-based technology can contribute to tourists' connectedness with the landscape and how it can stimulate pro-conservation values and attitudes toward the ecological landscape. This paper provides an overview of the current lessons learned in using geo-based technology to promote minor water-heritage sites. It explores literature on the connections between tourism and informal learning, especially the promotion of pro-conservation values and attitudes, and how geo-based technologies can contribute to this field. Furthermore, this article seeks to combine multiple types of geo-based technologies to create a seamless, free-choice learning experience on minor water-heritage sites.

²⁴ ARDOIN *et al.* 2015; BALLANTYNE, PACKER 2011; BEAUMONT 2011; FALK, BALLANTYNE, PACKER, BENCKENDORFF 2012; WEAVER 2005



1 Introduction

The relationship between tourism, education, and the adoption of an environmental ethic was a relatively under-researched field for a long time²⁵. Fortunately, scholars recently have examined the positive impact of ecotourism on tourists' knowledge, attitudes, and behaviours, resulting in a significant body of work on the benefits of travel for informal education or free-choice learning²⁶. An increasing number of studies empirically demonstrate the cognitive, affective, and behavioural outcomes of ecotourism practices²⁷. This academic endeavor has resulted in fruitful insights on the (long-term) positive impact of ecotourism practices. However, few studies have closely examined the mechanisms that have made a profound impact on such outcomes²⁸. As a result, the academic debate on the nexus of education, ecotourism, and sustainability outcomes remains relatively under-explored -- especially the effects of new technologies and communication platforms in support of free-choice educational ecotourism practices²⁹.

Accordingly, this paper provides a discussion of how geo-based technology can help develop respect and appreciation for ecological sustainability and foster knowledge acquisition from the ecological landscape through free-choice learning. We demonstrate how geo-based technology is utilised for the JPI Heritage EUWATHER project. EUWATHER aims to promote knowledge and rehabilitation concerning the unique cultural heritage of minor waterways and historic canals in four European pilot regions. Ca' Foscari University of Venice (project leader), University of Leiden, Frei University of Amsterdam, University of Girona, and the University of Brighton participated in this study. The project aimed to bring together people (locals and tourists, stakeholders, the public sector, etc.) to generate a body of data that can reveal the cultural and artistic heritage of minor waterways to create a Spatial Data Infrastructure (SDI) and interactive maps, while exploring ways to communicate this heritage to a range of audiences. The overall objective was to develop new opportunities for eco-tourism and outdoor recreation as a driver for sustainable development, together with better management and planning of secondary waterway networks.

First, we will discuss the academic literature on ecotourism and free-choice learning, as well as the value of using geo-based technology to develop respect and appreciation for nature and local heritage. We continue with a description of the developed material (e.g. narratives, multimedia) from the itineraries in the Italian case

²⁵ FALK *et al.* 2012

²⁶ BALLANTYNE, PACKER, FALK 2011

²⁷ ARDOIN *et al.* 2015

²⁸ BALLANTYNE, PACKER 2011

²⁹ TAN, LAW 2011



study. Subsequently, geo-based technologies for creating a seamless free-choice learning experience on minor water heritage are discussed. The study concludes with an inventory of the current lessons learned from the EUWATHER project and an overview of the research questions we seek to answer in the final phase of the project.

2. Theoretical framework: Geo-based technology in support of ecotourism practices

2.1 Literature on free-choice learning experiences and travel

Various scholars have underlined the potential of informal learning activities in tourist contexts for the development of pro-environmental attitudes and behaviours. Fun and challenging educational practices, such as *geocaching*, help people acquire knowledge and develop new skills while contributing to the self-development of the learner-traveler³⁰. Because of this understanding, supranational authorities such as the United Nations (U.N.) and the European Union (EU) refer, in their mission statements, to the role that informal education plays in addressing the environmental challenges of this century and how it can encourage individuals to shift daily habits toward environmentally sustainable actions³¹.

Powell and Ham (2008) examined to what extent a targeted interpretive programme may contribute to tourists' environmental literacy. They noticed that the offered free-choice environmental learning experiences during a trip to the Galapagos Islands made a significant impact on tourists' on-site knowledge. Furthermore, this targeted educational approach also contributed to environmentally responsible attitudes and behaviours. After the trip, 78% of the sample made donations to a Galapagos conservation organisation – an action that can be seen as pro-environmental behaviour³². Based on these findings, Powell and Ham posit that there is (preliminary) evidence 'that the type of ecotourism experience examined in the study is capable of (...) positively influencing the [tourist's] knowledge and attitudes toward protected areas (...)'³³.

Ballantyne and Packer (2011) demonstrated that free-choice environmental learning can have a positive effect on community-capacity building in relation to the environmental challenges of this century. They posit that the tourism sector has a great opportunity to address broader environmental problems through informal educational experiences. In turn, these learning experiences may have a profound effect on the visitor adoption of

³⁰ DONADELLI, ROCCA 2014; LO 2010

³¹ BALLANTYNE, PACKER 2011

³² POWELL, HAM, 2008

³³ POWELL, HAM, 2008



environmentally sustainable principles and practices. Although little is known about the effects of free-choice learning experiences during nature-based travels, there is empirical evidence that a conservation-based ethic can be developed through well-organised ecotourism practices. Ballantyne and Packer demonstrate that *post-visit action resources*, such as Facebook or Instagram, may contribute to tourists' adoption of environmentally sustainable behaviours. Using an online, proactive approach, ecotourism operators have the opportunity to remind traveler-learners about the urgency to adopt and maintain sustainable behaviours in their home environments³⁴.

Ardoïn et al. (2015) reviewed the aims, methodologies, and findings of empirical research on nature-based tourism between 1995 and 2013. Eleven studies emphasised the importance of a well-organised, tailored, and meaningful free-choice ecological learning programme to positively change the knowledge, attitudes, and behaviours of participants. The development of pro-environmental outcomes during ecotourism practices is highly dependent on the organisation of the informal curriculum. Furthermore, academics also have examined the influence of trip duration, pre-existing visitor characteristics, prior preparation, and post-visit support in developing positive pro-environmental behaviours across different types of travelers. As such, Ardoïn et al. argue that future research not only should focus on tourists' on-site actions, but also should seriously examine tourists' pre-visit assets (e.g., prior knowledge, experiences, interests, etc.) and post-visit orientations. Furthermore, characterising when and how changes in these orientations occur during the trip also could strengthen the academic debate in sustainable-tourism studies³⁵.

2.2 Enhancing free-choice learning with geo-based technology

Ardoïn et al. (2015) also explored the relationship between (digital) technology and free-choice ecological learning. They correctly assert that the advent of affordable smart-communication devices in the last decade has made technology ubiquitous in everyday lives. For example, tourists use their smartphones to navigate, search for information, and share experiences through social media, such as Facebook or Twitter. As such, (mobile) smart technology has a profound impact on our geographic cognition and behaviour³⁶.

Tussyadiah and Zach (2012) argue, based on an empirical study, that geo-based technology has a profound impact on three dimensions of geographic cognition: *landmark knowledge*, *route knowledge*, and *survey knowledge*. Geo-based technology is a

³⁴ BALLANTYNE, PACKER 2011

³⁵ ARDOIN et al. 2015

³⁶ ARDOIN et al. 2015



container concept that entails all kinds of geospatial technologies, such as car navigation, map applications, portable tourist guides, geographical information systems, etc.³⁷.

Tussyadiah and Zach investigated the added value of geo-based technology in constructing spatial experiences that represent geographic behaviours and overall spatial experiences (e.g., attachment to places). Based on their findings, the authors argue that geo-based technology helps the user develop authentic experiences at certain places. Here, mobile smart technology aggregates emotional bonds between the traveler and the landscape by offering tailored information and user-friendly functionalities that enhance the three dimensions of one's geographic cognition. As such, ubiquitous (geo-based) technology plays a key role in shaping people's spatial experiences³⁸.

Regarding the assumption that ubiquitous technology enhances spatial perceptions and may contribute to the free-choice learning experience, Tan and Law (2015) have demonstrated the potential of (digital) mobile learning for environmental interpretation and visitor education³⁹. Mobile and communication technologies allow tourists to access practical information anywhere and anytime, undertake different activities (and, as such, spend more time at the destination), view high-quality (multimedia) information at the visited area, and provide feedback for future strategic planning and development.

One of the few studies to empirically assess the impact of ubiquitous social-media technology on tourists' adoption of environmentally sustainable principles and practices was carried out by Wheaton et al. (2016), who investigated the overall spikes in the adoption of pro-environmental principles and behaviours after using social media as a post-action resource. Elaborating on the findings of Ballantyne and Packer (2011) concerning the influence of *post-action resources* on the pro-environmental behaviours of tourists in their home environments, they posit that technological extensions such as Facebook or Twitter indeed stimulate tourists' reflective engagement after tourism experiences. This personal reflection may, in turn, contribute to the development of pro-environmental values and behaviours⁴⁰. However, technology-enhanced, context-aware learning only will succeed if ecotourism operators adapt offered learning experiences to diverse needs and pre-visit learning predispositions: 'It will (...) require different visitor management and interpretative techniques to be applied at each site'⁴¹. During development of free-choice learning experiences, particular attention should be paid to tourists' learning conditions and contexts.

³⁷ TUSSYADIAH, ZACH 2012

³⁸ TUSSYADIAH, ZACH, 2012

³⁹ TAN, LAW 2015

⁴⁰ WHEATON *et al.* 2016

⁴¹ WHEATON *et al.* 2016



Furthermore, Wheaton et al. demonstrated that the learning effect generally lasts for three months. After this period, acquired knowledge and motivations for pro-environmental action start to fade. Thus, it is argued that ecotourism operators should employ post-action resources to remind visitors of their experiences and commitments. Tan and Law also acknowledge that learning takes place not only during the visit, but also before and after the tourism experience. Mobile learning should, therefore, be integrated into a seamless learning experience⁴² in which smart technology and software-based technological extensions are deeply integrated into one comprehensive learning entity throughout the entire tourism experience⁴³.

3. Creating the content for a seamless, free-choice learning experience on minor water-heritage sites: a case study description of the inland waterways of Venice

3.1 Between leisure and tourism: the opportunity 'offered' by minor rivers and small canals

In many respects, most of the analysis on tourism studies appears to be increasingly divided between an unquestioning embrace of market research, on one hand, and questions of discourse, culture, and representation on the other. Tourism is also often viewed and conceptualised as something unusual and exceptional to, or in contrast with, everyday practices and routines. Then again, leisure practices have been seen as more meaningful and localised because interweaving mundane, everyday activities with uncommon ones creates a complex contradiction in terms of understanding tourist activities in local communities and the tourism effects on places and heritage⁴⁴. This apparent contradiction allows us to re-think the phenomenon of tourism from a multi-layered perspective, as mobility practices in the middle of a conceptual axis of everyday and peak experiences, in an area where ideas and practices of the ordinary and the extraordinary blur⁴⁵. In this context, rivers and canals, especially in Europe, offer a great opportunity to link leisure activities with tourism-centric ones. Europe's geography provides an extensive network of natural rivers that have been connected over several centuries by considerable numbers of artificial canals. As noted by Erfurt-Cooper (2009), 'These extensive canal networks now support growing river tourism activity throughout Europe, particularly in the long-distance segment', but especially due to the geographical features of Europe and to the great diffusion of canal networks linking major cities with remote, rural regions. 'Over the last few decades, waterways have become more

⁴² CHARITONOS *et al.* 2012

⁴³ TAN, LAW 2012

⁴⁴ EDENSOR 2007; LARSEN 2008; RYAN 2010; KAARISTO, RHODEN 2017

⁴⁵ CRESWELL 2010, 2012, 2014



prominent sites for recreation and leisure activities⁴⁶.

The minor rivers and small canals offer a great opportunity to analyse and develop new studies and approaches about specific contexts. Much has been written about the many functions that can be derived from major waterways throughout Europe. The secondary, or 'minor', regional hydrography – e.g., small rivers and secondary canals -- is equally significant in forming a multi-functional resource.

Indeed, while secondary waterways offer similar water-management potential and capacity compared with major waterways, their cultural identity tends to be more localised and thereby more hidden from wider research and policy agendas, while their tourism potential tends to be related more to small-scale ecotourism⁴⁷.

Local attitudes toward some rivers and canals in the inland of Venice are oriented toward developing alternative approaches to mass tourism, which is inundating the historic city. Locals view this as a priority, although there has been little response in political circles. The impressive extent of the hydraulic network of canals in the Venetian hinterlands hints at a potential for a successful renewal of land-development dynamics, which, to date, have led only to limited improvements in Venetian urban planning⁴⁸.

3.2 All the waterways lead to Venice: description of the Italian case study

For more than 700 years, from the 12th to the 18th centuries, the Venetians carried out extensive hydraulic work in their hinterlands to control and manage their waterways. Local engineers continuously modified and diverted local rivers, including major ones, such as the Po, which flowed naturally into the Venice Lagoon and its vicinity. These efforts created a unique chapter in hydraulic history and formed a heritage that was peculiar to Venice's hinterlands⁴⁹. Therefore, the present-day hydrography of the Venetian hinterlands is the result of a long history of human intervention that dates back at least to the Middle Ages. This enormous inland-water heritage – both tangible and intangible -- currently is not at the centre of regional government policies. The regional government has demonstrated little interest in fostering the recovery of navigation along the rivers and canals (with the sole exception of Riviera del Brenta, the well-known elongated Grand Canal), despite their high potential as tourist and leisure attractions. Veneto is one of the most-visited regions in Italy, with more than 60 million visitors annually. There is Venice, the hyper-touristic-city⁵⁰; the Dolomites; the Alps; the City of Verona, with its

⁴⁶ ERFURT-COOPER 2009 pp. 95-96

⁴⁷ VALLERANI, VISENTIN 2017

⁴⁸ EULISSE and VISENTIN 2017

⁴⁹ CIRIACONO 2006

⁵⁰ COSTA and MARTINOTTI 2003



Shakespearean vibe; and the Palladian Landscape, with several villas dotting the plains and foothills of the Alps. All of these attractions are UNESCO heritage sites. Above all, Venice is a borderline case, where mass tourism is still growing, having reached over 7 million tourists in 2016 (estimate), making a huge impact on the city⁵¹.

The watery geography of Veneto includes the main regional rivers -- many only partly navigable -- such as the Po, Adige, Brenta, and Piave, which discharge into the Adriatic Sea, as well as several artificial canals that were built from the 12th century onward to strengthen navigational connections between Venice and Ferrara, Mantua, Milan, Padua, Pavia, and Verona, as well as several minor towns. An extensive network of navigable waterways was thereby created to facilitate trade and for strategic military reasons, i.e., the transportation of troops.

This secondary waterway network crossed the entire region, facilitating access to the most important heritage sites, cities, walled towns, and villas, representing a potential -- and unexplored -- conduit for visiting the region. These historic inland waterways of Venice may also serve as a desirable leisure outlet for locals, and they also have the potential to be an interesting water-tourism destination in peri-urban areas⁵².

However, the tourism potential of minor rivers and small canals in Veneto is an under-researched topic. For the Italian case study, we considered three different types of minor water flows. The first was the Battaglia and Bisato canals, one of the most ancient European artificial waterways. It was built between 1189 and 1201 and is pensile. Until the 1960s, it was used only for trade purposes. The second was the Bacchiglione River, which flows through several cities, including Vicenza and Padua. We consider only the low section after Padua, where the river is highly managed and canalised. The third is the Sile, a 90 km river in northern Italy, originating in the line of springs that cross the plain parallel with the mountain foothills of the Alps, with residual semi-natural reaches.

3.3 Creating a database in a collaborative way

One of the aims of the project is to foster, at a later stage, sustainable tourism in areas currently off the beaten path of tourism traffic. Moreover, very little is known about using approaches to cultural heritage that reflect external (tourist) interests, as well as local values on the scale of a (minor) waterway system, or about the interface between research and the development of marketing products for both locals and tourists. In

⁵¹REGIONE VENETO 2016. The number is referred only to the touristic arrives/presences not to the daily commuters, or to the daily visitors (day-trippers).
<http://statistica.regione.veneto.it/jsp/turi1.jsp?D0=2016&D1=REGIONE+VENETO&D2=00Totale+anno&D3=Presenze+annuali+per+mese+e+provincia&B1=Visualizza>

⁵² VALLERANI 2004, 2013



geographical studies related to tourism, the presence or absence of river-tourism activities along a waterway can tell us what kinds of relationships a society has with the hydrographic networks of its territory and what kinds of cultural dialogue spring from it. This discourse is not only about tourism *per se*, but also about how waterscapes are responding to political and economic changes at all levels. Thus, no studies of changes to rivers and canals should overlook tourism, and efforts must be made to examine how tourism fits into broader questions of sustainable growth and development related to waterscapes⁵³. The project was first articulated (especially during the first year) in census activity that involved generating a database. To generate the local database, each of the European partners worked on a census with a shared methodology. The plan was to create a record of all bridges, artefacts, traditional boats, locks, mills, sheds, banks, and river-harbours. The census also recorded intangible heritage -- oral history and visual arts -- as well as pictures, paintings, poems, traditional celebrations, interviews, local newspapers, and moving settings. This census is not just a list; it's a descriptive record aimed at creating metadata with the characteristics of objects, mapped as points of interest and connected to contexts, i.e., places⁵⁴. In the case of Italy, three rivers and canals were mapped, and 130 points of interest (POIs) were divided more or less in equal proportion for each of the three case studies. It is useful to note that some elements are similar or correspond to all the case studies. For example, some typical river fish are present in all the waterways considered, and some traditional wooden boats are used in all the inland waterways, with various landscape features, such as the reclamation landscape, sharing similar peculiarities (Table 1).

Table 1: The exact amount of elements recorded for each sub-category

Architectural Heritage	Hydraulic Infrastructure	Cultural representations	Landscape Features	Natural Heritage	Histories and Memories	Literature, poetry, and songs	Tangible folklore	Vessels
41	24	15	4	7	16	8	8	6

⁵³ AIME, PAPOTTI 2012

⁵⁴ The census list was divided in 9 sub-categories: Architectural Heritage (AH); Hydraulic Infrastructure (HI); Cultural representations –visual, i.e. painting, photography, film, etc. (CR); Landscape Features (LF); Natural Heritage (NH); Histories and Memories (HM); Literature, poetry and song (LPS); Tangible folklore –traditional costumes, crafts, tools, etc. (TF); Vessels - boats, ships, ferries, etc.- (VE).



The collection of data was done concurrently with a review of the available literature (including books, local newspapers, and journals), through interviews with local historians and researchers, and through fieldwork in every case study to geo-map every single element. The EUWATHER research seeks to combine historical and design research components to generate an interdisciplinary approach to data generation (database) and an analysis that reflects the ‘participatory turn’ in arts and humanities research⁵⁵. However, to succeed, it is crucial that during the development process of the project, the interests of users, stakeholders, and local communities take precedence from the beginning. In close collaboration with stakeholders who play a major role in the economics of the region, we analysed the end-user requirements, and we tested the local itineraries in local communities in the context of dissemination workshops. Feedback on the content has been generated. The Italian group held individual meetings with specific stakeholders or people belonging to local communities, and it organised four different workshops to share knowledge, suggestions, information, expertise, etc.. The first workshop was held on 8 April 2016 in Venice at the University of Ca’ Foscari. This first meeting was directed especially at stakeholders and associations involved in river tourism. There were up to 35 stakeholders present, coming from the three different areas of study. The stakeholders came from distinct sectors, including the public sector, entrepreneurs, local associations, local experts, and tour operators, among others. We then organised three local workshops for each case study dedicated to the local communities to give voice to ‘water’ inhabitants: 18 November 2016 for the Battaglia and Bisato Canals (Municipality of Battaglia Terme), 3 February 2017 for the Bacchiglione River (Municipality of Pontelongo), and 31 March 2017 for the Sile River (Municipality of Casale sul Sile). Altogether, more than 180 people attending the three workshops. During these local workshops, we distributed a common questionnaire that was structured in three parts, with one being more general, utilising seven closed questions about the relevance of project objectives (evaluation from 1 to 5). A second part was pertinent to the main themes related to waterway tourism. We proposed a set of priority themes about river navigation, and each person could express three preferences. The last part was structured with five open questions about heritage (tangible and intangible), purpose, local knowledge, and unknown water histories. The objectives of this questionnaire were to enhance local community and association involvement, launch a qualitative analysis of local perceptions on waterways, try to understand the main problems related to waterscape quality, discuss issues tied to waterway accessibility and navigation, and intensify local awareness of tourism efforts. What’s interesting was discovering that societal attitudes toward water

⁵⁵ GILCHRIST 2017



heritage in local communities revealed an increased appreciation for riparian environments insofar as they provide ideal settings for sports and recreation, as well as opportunities for cultural tourism.



Figure 1: Below, three pictures taken during the local workshops and one of the fliers prepared for promoting the events. Starting from top-left: the flier prepared for the Pontelongo workshop; Casale sul Sile (31 March 2017); Battaglia Terme (18 November 2016); Pontelongo (3 February 2017).



3.4 Small stories from small rivers: the itineraries

All the information coming from the database -- the workshops, the personal meetings with local experts and historians, and the filed work -- must be understood in a general methodological framework that we applied during our research -- especially during the itineraries' generation. The EUWATHER conceptual framework for this research is known as the Collaborative Stories Spiral (CSS). It is a new approach to the generation and use of oral histories⁵⁶. In building upon conventional participatory approaches to research, CSS offers a framework within which oral histories are simultaneously generated, mediated, and remediated as a means of co-creating a deep cultural understanding of Europe's smaller waterways. Through the CSS, it is possible to recognise that minor hydrography offers not only valuable assets that are at the core of landscape management, but also more intangible aspects that actually could matter deeply to people, such as 'familiarity' or the complex, emotional (and often unknown) relationships that affect what is understood as 'sense of place'. The whole European-waterway system is an endless repository of water-related stories simply waiting to be re-told, re-evaluated, surveyed, and catalogued. Thus, recording community stories bridges the historical practices of unearthing contingent social, political, economic, and technological complexities of context, as well as a prefigurative interpretive stage, following Ricoeur (1984)⁵⁷, to understand the structures of river and fluvial life that enable narratives and make storytelling possible⁵⁸.

⁵⁶ GILCHRIST, HOLMES, LEE, MOORE, RAVENSCROFT 2015

⁵⁷ RICOEUR 1984

⁵⁸ LORIMER 2003; LORIMER, PARR 2014; MICHON 1984

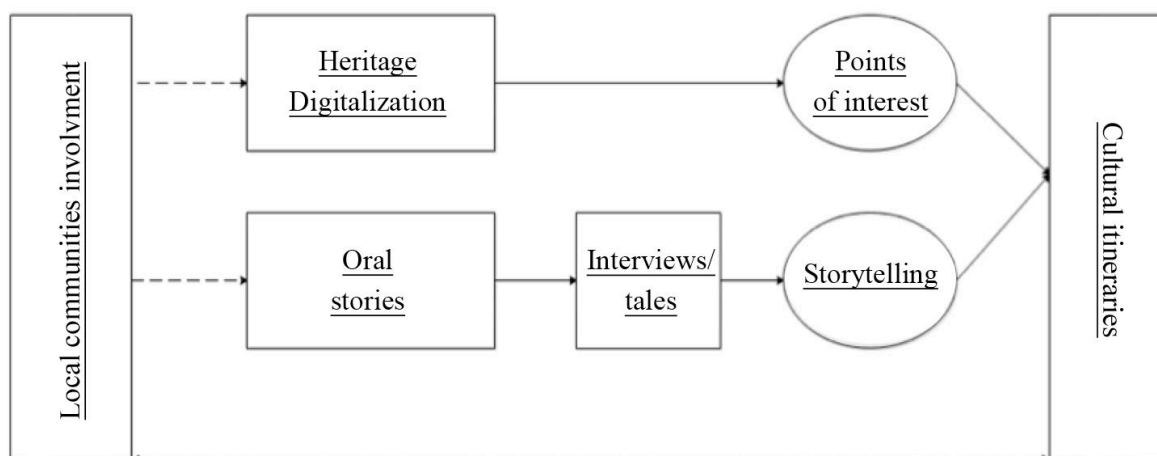


Figure 2: Below is a general scheme of the research process involved in integrating oral histories (1):

We recorded 18 interviews during our research. Decisions on whom to interview were made after collecting several oral stories that emerged from our studies of available literature on the canals and rivers, and from making first contacts with local historians, librarians, and stakeholders. Through a snowball effect, our potential pool of interviewees grew quickly, especially after the local workshops, where we asked explicitly through the questionnaires whether participants had personal stories to share, or whether they could direct us toward people who did have stories. As illustrated in the graphic above, we selected interviewees based on how their stories fit in with the final goals of the project: the itineraries. Therefore, we favoured interviewees who could help us regarding specific themes treated by the itineraries. Our final goal was to create a series of cultural itineraries to re-evaluate waterways' tangible and intangible heritage and to increase eco-tourism opportunities, as well as enhance territorial competitiveness and awareness. In the end, we designed six itineraries for the Italian case study (tours on foot, by bicycle, and by boat or kayak), and we considered approximately from 11 to 14 POIs for each trail. The number of POI varies from the length of the trail. Every itinerary was based on storytelling that links the different POIs, especially cultural practices along the rivers and canals from the past to the present, transforming these practices and manifesting culturally specific meanings and values, economically-driven forces, and political processes. While this approach does not account for many tourism experiences per se (at this stage), it does open up important questions regarding Veneto's cultural politics within the context of its



communities' historical waterway routes⁵⁹.

4. Enhancing the pre-visit, on-site, and post-visit ecotourism experience with geo-based technology

According to the discussed body of knowledge on maximising the impact of free-choice learning on cognition, attitudes, and behaviour, persuading the tourist to acquire new knowledge about destinations' nature and culture before, during, and after the visit is key. Hence, an appealing seamless, informal learning experience must be developed that allows the tourist to gently add new pieces of information to his or her prior knowledge. We posit that geo-based technology offers rich opportunities to motivate the tourist to learn during the pre-visit, on-site, and post-visit phases.

The project team responsible for the digital work package (University of Leiden, Vrije Universiteit Amsterdam) set up a website, geographic information system (GIS), mobile application, and social media channels. These components were selected to motivate the tourism-learner to visit the EUWATHER pilot-study regions and become informed about their tangible and intangible heritage.

Table 2: Geo-based technologies in support of a seamless, free-choice, ecological learning experience

Medium	Software	Target audience	Function	Location
Website	Wordpress	Tourists	Practical information	www.waterwaysexplorer.org
StoryMap	ESRI StoryMaps	Tourists	Pre-visit free-choice learning experience	www.waterwaysexplorer.org → case studies
GIS	ESRI ArcGIS Online	Professionals	Perform spatial analysis, develop/improve heritage trails	www.waterwaysexplorer.org → Waterways Explorer Map

⁵⁹ GILCHRIST 2017; EULISSE, VISENTIN 2017



Mobile application	IZI.TRAVEL	Tourists	On-site free-choice learning experience	www.waterwaysexplorer.org → Waterways Explorer App
Location-based social media	Facebook, Instagram, Twitter	Tourists	On-site and post-visit learning experience	www.waterwaysexplorer.org → Twitter, Instagram, Facebook

4.1 StoryMaps

The EUWATHER website functions as a starting point, where all the different components – StoryMaps, GIS, mobile application, and social media – have been integrated. From here, the traveler can explore the natural landscape, local society, and culture of the tourism destination in his or her home environment. The website provides practical travel information and offers StoryMaps to create a pre-visit learning experience. StoryMaps uses geo-based technology to allow a tourist to integrate multimedia and geospatial information to create a rich, visual image of a destination. StoryMaps are created to foster the traveler's understanding of a specific subject or area with audio, video, images, and dynamic mapping features. In EUWATHER, these mapping features can be used to illustrate paths and points of interest on a heritage trail. We hypothesise that StoryMaps effectively contribute to free-choice learning experiences on minor water heritage. It allows the tourist to get acquainted with the region's tangible and intangible water heritage. As such, a StoryMap provides serious opportunities to tap tourists' pre-visit learning predispositions.

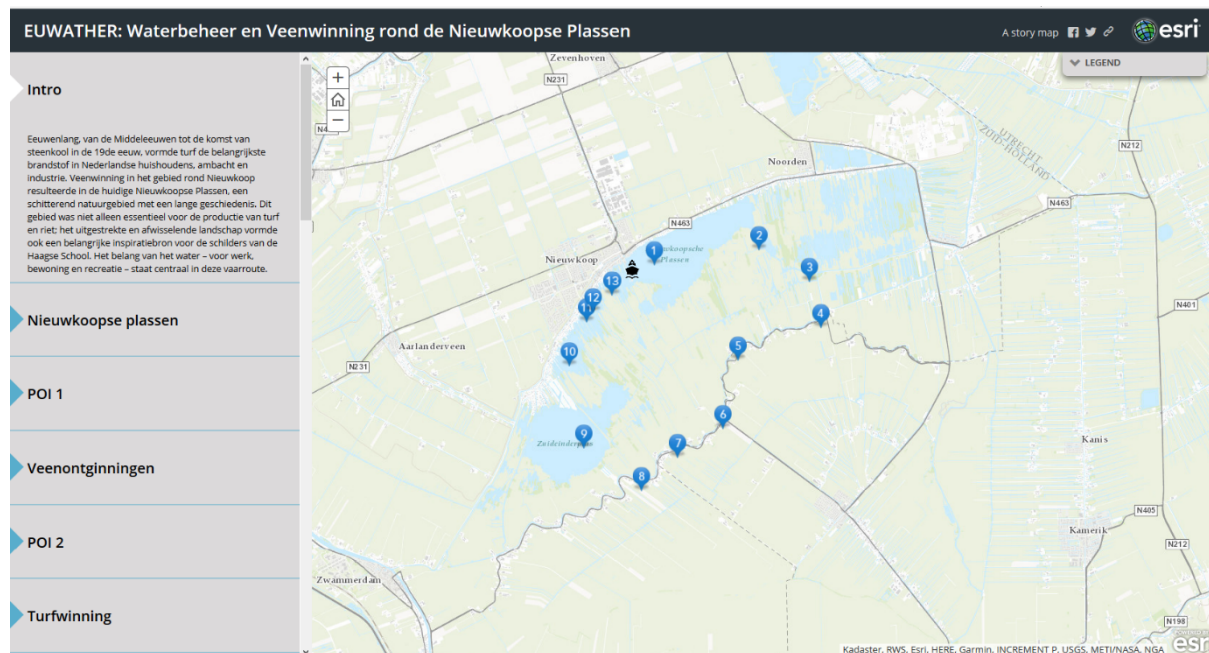


Figure 3: Spatially enriched narrative on Dutch water heritage made with an ESRI StoryMap.

4.2 Mobile tourist guide

Subsequently, a traveler's guide has been developed to inform the tourist on site about the region's tangible and intangible water heritage. Like StoryMaps, the mobile guide provides heritage sites with interesting stories, background information, and high-quality images, videos, and voice narratives. It aims to trigger tourists' prior knowledge and combine it with new information and emotional experiences during visits to water-heritage sites. Hence, after one enters his or her personal attributes, they are enriched with new pieces of information that will subsequently result in a positive, free-choice learning experience. We hypothesise that adding this mobile application will encourage seamless learning experiences, ultimately fostering understanding and appreciation of visited water-heritage sites.

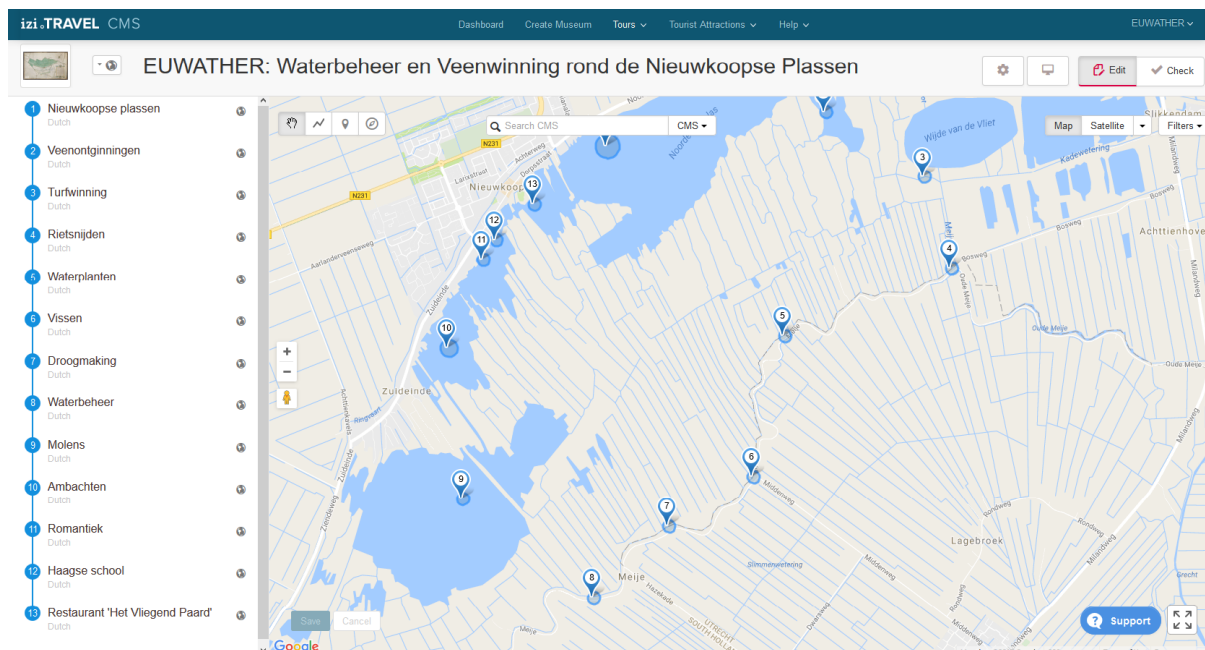


Figure 4: Mobile tour guide on Dutch water-heritage sites made with IZI.Travel.

4.3 Location-based social media

EUWATHER uses social media by creating an online community for discussing the conservation of minor water-heritage sites. Location-based social media, such as Instagram and Twitter, among others, let users share locations with other followers. Location-based social media have proven to be very strong post-visit resources for ecotourism practices. These resources let operators share their news and offerings instantly, as well as keep in touch with other followers in a very direct manner. It also offers a platform to remind visitors about pro-conservation behaviour at sites. Moreover, social media let tourists share their experiences with the digital world, generating word-of-mouth recommendations on interesting points of interest through immediate feedback on attractions⁶⁰. Ultimately, social media function as platforms for reflective engagement. Reassessing shared texts and media in the post-visit phase helps tourists process cognitive and affective aspects of their experiences, which will, in turn, result in long-term

⁶⁰ DICKINSON 2014



learning. We hypothesise that social media have a profound impact on facilitating tourists' long-term learning outcomes⁶¹.

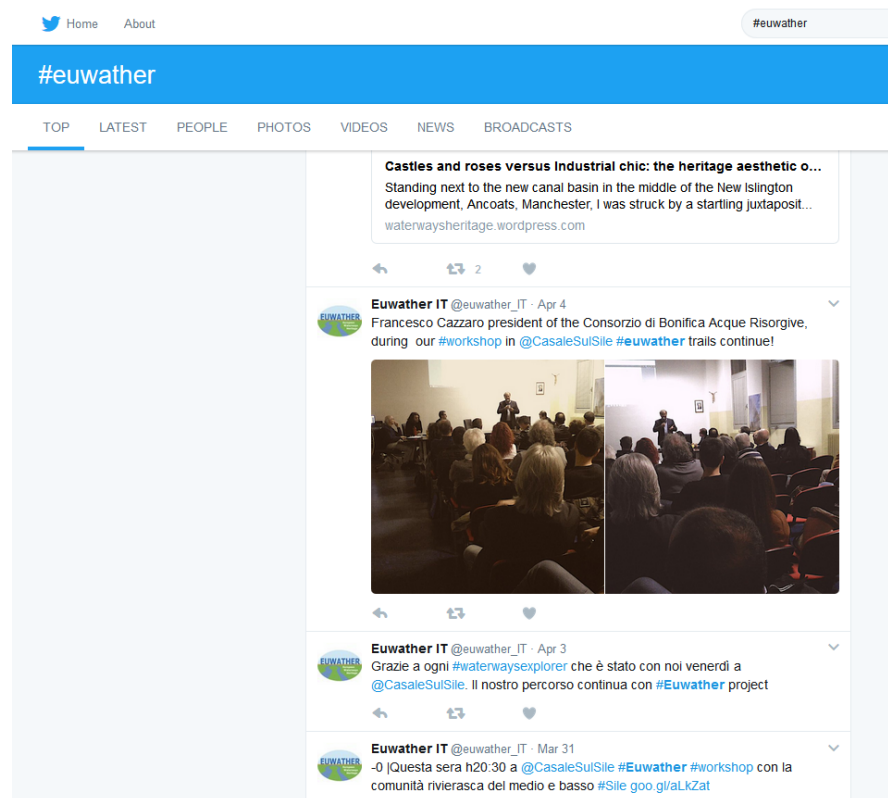


Figure 5: Social-media sites, such as Twitter, can provide travelers with the latest updates.

5. Conclusions and opportunities for further research

The aims of this study were to investigate an academic debate on tourism, informal learning, and ecological appreciation. We have sought to understand the impact of free-choice learning experiences on tourists' understanding and appreciation of minor water-heritage sites. Although not empirically tested, the results indicate that learning is a cumulative process that not only occurs on-site, but also is highly influenced by pre-visit

⁶¹ FALK 2012



assets and post-visit experiences⁶². As such, ecotourism operators can maximise tourists' learning experiences by focusing on all three phases of the learning experience.

The aforementioned studies represent just a small sample of the body of knowledge on the impact of free-choice learning on the development of pro-environmental values and behaviours. A comprehensive analysis of the academic debate on this topic goes beyond the scope of this study. However, the discussed literature illustrates four key notions on ecotourism and learning that have been considered in the EUWATHER project: 1) Ecotourism operators promote free-choice learning experiences, and, as such, offer rich opportunities to motivate tourists to adopt environmentally sustainable principles and practices; 2) ecotourism fosters an understanding and appreciation of nature, local society, and culture, finding a place in all three phases of the travel experience -- pre-visit, on-site, and post-visit; 3) pre-visit knowledge assets highly influence the free-choice learning experience during ecotourism excursions. (In this paper, we hypothesise that these three assumptions about ecotourism and free-choice environmental learning also apply to free-choice learning amid ecological landscapes); 4) Local communities play a crucial role during workshops, by suggesting new opportunities and strategies for enhancing awareness of their own daily waterscapes. The increasing attention paid by local communities on local recreation, eco-tourism practices, and the quality of local bodies of water fosters a new interpretation, reimagining historical views on local waterways in a modern perspective.

Furthermore, we hypothesise that geo-based technologies benefit free-choice learning. The above discussions (empirically) indicate a positive influence from geo-based technology on the construction of overall place experiences. Location-based applications enable one to navigate tourist destinations, access on-site practical data and high-quality background information, and provide feedback and share experiences on social media. In addition, during the pre-visit and post-visit phases, these technologies may have a profound effect on free-choice learning experiences. GIS-enhanced websites and location-based social media enable traveler-learners to virtually explore tourist destinations and adjust their pre-visit orientations on the natural landscape, local society, and culture. Furthermore, this web portal lets tourists share their experiences in an embedded, geo-based, social-media environment (e.g., interactive maps). By applying geo-based technologies during the pre-visit, on-site, and post-visit phases of the travel experience, a seamless, free-choice ecological learning experience can be created to foster tourists' understanding and appreciation of the ecological landscape.

⁶² BALLANTYNE, PACKER 2011



In the final phase of this project, further empirical research will be undertaken to develop an understanding of the influence of geo-based technologies on visitors' knowledge and attitudes toward ecological landscapes. Few studies have tried to empirically elicit the mechanisms that positively affect tourists' cognition, appreciation, and behaviours during ecotourism excursions. Thus, this project aims to provide scientific evidence to explain any causality between geo-based technologies and improved knowledge and appreciation of minor water-heritage sites. Hopefully, these outcomes will strengthen the body of knowledge on travel and informal learning, as well as provide practical recommendations for ecotourism operators to include location-based action resources that offer seamless, free-choice learning experiences to travelers.

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Assessing the tourism potential of historical canals as cultural heritage. Lessons from the Baix Ter region (Costa Brava, Spain)

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Abstract

Historical canals and secondary rivers are linear paths of high cultural value where it is possible to identify specific and unique cultural landscapes. Since tourism is nowadays used to stimulate regional development, cultural heritage tourism is used for, both preservation of regions as well as economic development of the territory. Tourists expect to make a much deeper and profitable use of the landscaping, environmental, natural and architectural resources. According to this, the development and application of a system assessing the tourism potential of cultural and heritage assets including cultural, physical, product and experiential values is vital for the sustainability of the tourism attractions. This paper aims to identify and characterize the nexus of cultural heritage and potential touristic values from the results of the EUWATHER project. From a mixed methodology, this paper analyses the role of the main historical irrigation systems of the Baix Ter area (Costa Brava, Spain) from their existing and potential cultural heritage. For this purpose, this contribution will discuss about how to improve the tourism offer of this area, what actions have to be addressed, and who should lead them in order to ensure the tourism potential of the Baix Ter region. The final purpose of the research project is to stimulate local people to rediscover their waterways, as well as promoting eco-tourism and fruitful involvement of territorial competitiveness, fostering joint actions to plan the recovery of abandoned waterscapes.

Introduction

Several tourism destinations have seen progressive deterioration in the main tourism performance indicators (Butler, 2006). This situation, which is quite evident in mass coastal destinations, can be identified as stagnation or decline phase, or maturity (Hernández, Álvarez, & Padrón, 2015). In this phase, viable capacity levels have been reached or exceeded, which is related to environmental, economic and social problems



(Jurado, Damian, & Fernández, 2013). Tourism makes intensive use of common resources (Farsari, Butler, & Prastacos, 2007). Over-exploitation and congestion externalities linked to their use may result in serious damages to the environment and a destination's image, which compromises the long-term sustainability of tourism (Canavan, 2014). Although coastal tourism was regarded, in its origins, as exclusive to elite tourists, its democratization in the second half of the twentieth century contributed to its expansion, especially in southern Europe, which became a symbol of mass tourism (Bujosa, Riera, & Pons, 2015). Since then, statistics have displayed the importance of sun-and-beach tourism as the largest segment of world tourism, showing high rates of growth to date (Oh & Kim, 2016). Looking at Europe, spending time in the sunshine or at the beach was for 48% of Europeans, the main reason to take a holiday in 2014 (European Commission, 2015). According to this report, the sun or beach is the main reason for going on a holiday (of four nights or more), while just under a third (31%) say that nature (landscapes, mountains, rivers, etc.) was one of the main reasons they went on holiday in 2014. In addition, more than a quarter of respondents (27%) mention culture and heritage as two of their main reasons for taking a holiday, and around one person in eight (12%) went for a sport-related activity (walking and cycling). Many studies present sun-and-beach tourism as an undifferentiated market segment, with the presumption that all tourists look for sunny weather and idyllic beaches anywhere (Guclu, 2011). However, in fact, there are many differences within this segment depending on the heterogeneity of motivations, experiences, perceptions, and, even, the way in which tourists use time and space at the destination. Examining sun-and-beach tourist spatial behavior is important, not only to better target this segment, but also to improve planning and marketing strategies to manage tourists once they are at the destination (Lew & McKercher, 2006). The latter has a significant importance in destinations at a mature stage which present a high degree of dependence of the exterior, their demand is consolidated, their carrying capacity is near maximum and their principal tourist multipliers are exhausting (Timothy & Boyd, 2003). The various elements of a tourist-recreation product (landscape elements, attractions, amenities, facilities, etc.) and tourist locations (cities/villages, accommodation facilities, service areas, etc.) are combined by tourists according to their knowledge, images, preferences and current opportunities (Dejbakhsh, Arrowsmith, & Jackson, 2011). Tourists do not use the recreational possibilities in a given area randomly (Zillinger, 2007). Their recreational pattern can be depicted as a network, consisting of different nodes (several locations and landscape elements) that are connected to each other in some way (Butler, 2011). These relationships become tangible as tourist flows established by the aggregation of individual trips made by tourists (McKercher, Wong, & Lau, 2006). In this way, a macro-spatial analysis of intra-destination movements is the



result of connections between nodes in a tourist region, such as hotels, cultural sites, beaches, or shops (Smallwood, Beckley, & Moore, 2012).

Literature Review

There is large consensus that tourism plays a key role in the development and competitiveness of many regions, that is, tourism is an agent capable of providing the means by which local people can be identified (Alberti & Giusti, 2012). Numerous studies have discussed the major aspects of tourism, such as economic benefits, social concerns, environmental sustainability, and their impacts on residents' attitudes or perceptions toward tourism in the host community (Yu, Chancellor, & Cole, 2011). Since tourism is nowadays used to stimulate regional development, cultural heritage tourism is used for the preservation of regions as well as for their economic development (Tweed & Sutherland, 2007). Many cultural and heritage tourism destinations are located in rural or suburban areas, usually quiet and peaceful residential settings during off-peak tourist seasons (Jeon et al., 2016). Heritage tourism embraces both eco-tourism and cultural tourism, with an emphasis on conservation, sustainable practices and cultural heritage (Landorf, 2009). Tourists expect to make a much deeper and profitable use of the landscaping, environmental, natural and architectural resources (Keitumetse, 2009). The argument is that cultural heritage with multi-functional nature must be invested with new meanings to make them more alluring, seductive and marketable to a consumer market looking for new experiences (Novelli, Schmitz, & Spencer, 2006). Overall, cultural heritage is a non-renewable resource and can be seen as a value in itself with a right to remain unspoilt (Richards & Wilson, 2006). However, there is a growing tendency to see cultural heritage as a resource or as an asset for fulfilling human needs, often termed "added value" for the traditional offer in consolidated tourism destinations (Loulanski & Loulanski, 2011). Canals and rivers are linear paths of high cultural value where it is possible to identify specific and unique cultural landscapes, while secondary or minor regional hydrography is equally significant in forming a multi-functional resource to be valued by society. Secondary waterways are essentially local waterways for local people, but with potential to fulfil many of the functions of main waterways. In the post-productivist transition, rural resources that were traditionally the basis for the regional competitiveness are now increasingly subject to other demands, including attracting tourists (Cawley, 2008). This is seen to be a consequence of or a response to the intertwined processes of globalization, which involves an increased awareness of the specific qualities of the local community. Knowledge about the connection between agriculture and cultural heritage is mainly related to the multi-functionality debate divided into views from the outside



(typically tourism and recreation) and insiders' views (farmers and other locals in agricultural areas) (Butler, 2010). The relationship between cultural heritage and agriculture is of special relevance for two reasons: the combination of agriculture as economic activity and system of land, water and environmental issues on the one hand, and cultural heritage involving conservation on the other hand, represents a challenge. Cultural heritage is also actualized through the role of agriculture as a producer of collective goods in addition to food and fibre. In this way, the presence in many European countries of artificial waterways connected to natural hydrograph can be considered a relevant cultural heritage (Sun, Jansen-Verbeke, Min, Cheng, 2011). It is indeed a multi-functional heritage that deserves a renewed, coordinated commitment to its revaluation, by considering both its structural hydraulic artefacts (canals, bridges, weirs, mills...) and their related waterscapes as new vocation for recreation and amenity functions (Ruhanen, 2013). With the aim of shedding light on the importance of diversification of tourism offer in a sun-and-beach mature destination, this paper aims to identify and characterize the nexus of cultural heritage and potential touristic activities from the preliminary results of the EUWATHER project as a tool for promoting the unique cultural heritage of minor waterways and historic canals in different European pilot regions.

Methodology

Integrated approaches, dealing simultaneously with the environment and economic development, and with often neglected social, political and cultural issues, such as local communities and cultures, are increasingly advocated in the tourism field (Bramwell & Lane, 2005; Dinica, 2009). Accordingly, a mixed methodology with both qualitative (literature review and key stakeholders' interviews) and quantitative (items identification and characterization) perspectives is required. This paper is based on the preliminary results obtained for the *European Waterways Heritage: Re-evaluating European minor rivers and canals as cultural landscapes* (EUWATHER) project, granted by the FP7 ERA-NET PLUS JPI on cultural heritage (HERITAGE PLUS Joint Call 2014-2015). This project provides a diverse and innovative vision for cultural heritage and tourism nexus in minor waterways and historic canals in four European regions of Spain, Italy, England and The Netherlands. The aim of the project is co-design, with key stakeholders, a body of data that can reveal the cultural and artistic heritage of minor waterways as an additional tourism offer for traditional tourism products. A Spatial Data Infrastructure (SDI), interactive maps and a mobile application are developed in order to share the cultural heritage of each area to a range of audiences. One of the expected outcomes is a digitally collected, structured, standardized and managed census of the waterscape heritage (both

material and non-material, including the heritage of waterscapes in fine arts and photography) based on an interdisciplinary, multi-stakeholder and trans-national approach. To this end, an identification and characterization process of the heritage items for each case study (three historical irrigation canals) were conducted from January to October 2016. In addition, a series of cultural itineraries to re-evaluate waterways' heritage are defined to promote the social recognition of the pilot region from its tourist potential. The obtained data was digitally collected from literature research and fieldwork analysis (Figure 1). In parallel, and following the hypothesis that participation and knowledge sharing are intrinsic conditions for valuating cultural heritage, an individual participation process involving identified local existing stakeholders (e.g. public administration, water agency, irrigators' association, cultural public and private foundations and museums, Natural Park' managers, environmental platforms, among others) was carried out. Interviews were used to know the touristic potential of the historical irrigation systems as cultural heritage.

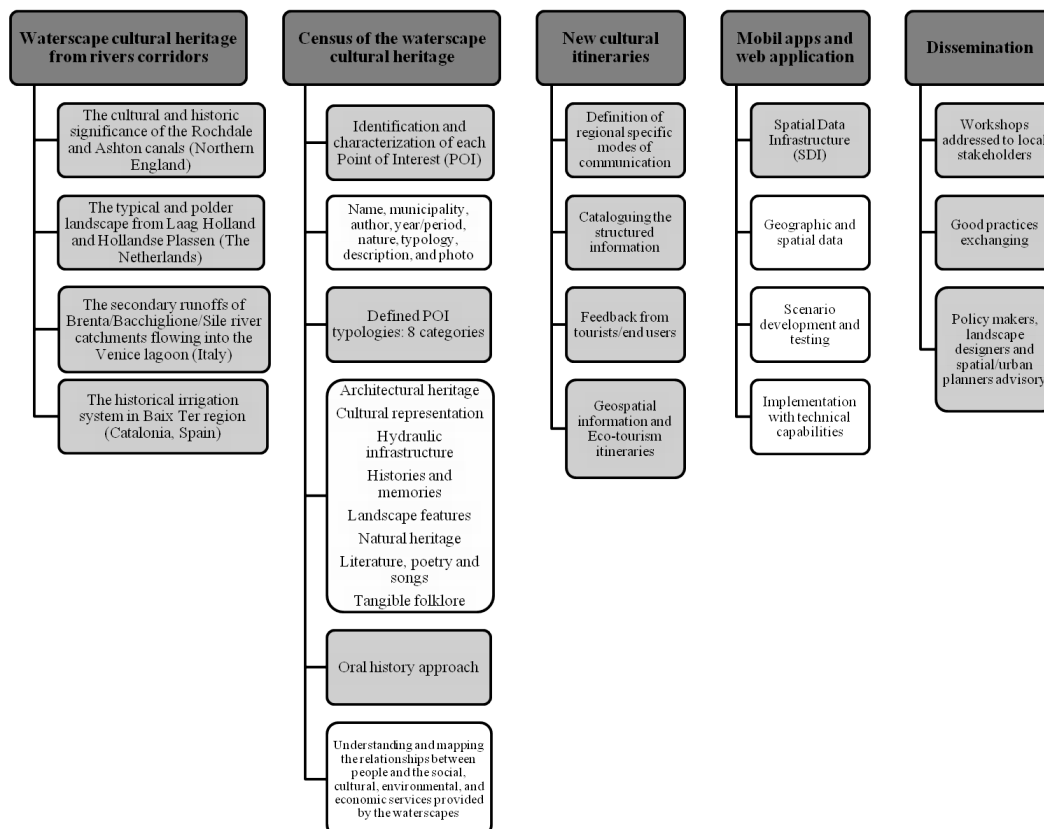


Figure 1. Methodological approach for developing the EUWATHER project



Case studies

The Costa Brava (Catalonia, Spain) is one of the most important tourist destinations in the Spanish Mediterranean, with a well established reputation that attracts million tourists a year.

According to the Government of Catalonia's Business and Labour Observatory, Catalonia received 17.4 million foreign tourists (3.7% more than 2013) in 2015, who spent over €15.63bn (a 3.4% year-over-year increase). By markets, France is still the destination's biggest source market with a total of 28.6% of the tourists who visited the region over the year. The number of tourists from other major markets has also increased, including those visiting from the United States (25.9%), France (8.2%), the UK (6.5%) and the rest of Europe. The source market with the biggest decrease in tourists was Russia, down to 31% from 2014. The Girona region and its Costa Brava and Pirineu de Girona brands registered 4.6 million foreign tourists in 2015 (up 3.32% from 2014) and 18.9 million overnight stays (2.83% more than in 2014). Since it first became a tourist destination at the end of the 1950s, tourism has been the most important productive sector in the area and has completely transformed the territory, and its society and economy. The Costa Brava is seen as an old mature tourism destination within Europe, where tourism activity has been promoting for ensuring its economic development (Donaire, Fraguell, & Daunis, 1997). However, as occurs in other mature destinations in the Mediterranean area, and in conjunction with the development of tourism, the coast has been very heavily used and degraded, and at the turn of the century, traditional tourism has stagnated (Gabarda, Ribas, & Daunis, 2015). The Baix Ter, situated in the hinterland of the central part of the Costa Brava, is an alluvial plain that represents one of the main agricultural areas of the internal basins of Catalonia region (Ribas, Pavón, Ricart, & Roset, 2016). The Ter and Daró rivers have over the centuries shaped an agricultural landscape including a network of secondary canals and ditches to distribute water for supplying an irrigable area of 6,000 ha. The three most relevant secondary canals –the Sentmenat canal, the Molí de Pals canal, and the Vell canal– play a key role in this vast agricultural plain located between the villages of l'Escala and Pals (Figure 2) and bounded by a consolidated sun-and-beach tourism offer. Two main circumstances related to the management of natural resources in the Baix Ter area must be considered: i) Competition for water use. The area has a Mediterranean climate, characterized by important variations in water availability. Additionally to the water use for agriculture, it must be considered the huge amount of water transferred from the Ter River towards Barcelona metropolitan area ($8\text{m}^3 \text{s}^{-1}$) for urban and industrial uses, which currently represents 70% of the Ter River flow rate and

would have priority in case of restrictions. Moreover, the recreational uses of water are very important in the Costa Brava region (which has a great tourism and economic interest, approximately one third of the economic value generated by tourism for all of Catalonia), especially during the summer period, when the agricultural water demand is the highest; ii) High environmental and landscape importance, both for the tourist interest of the area as well as to be partially included in the Montgrí, Illes Medes and Baix Ter Natural Park, created in 2010, and considered an area of special environmental protection by the Autonomous Government of Catalonia (Ribas, Llausàs, Saurí, Roset, 2012b).

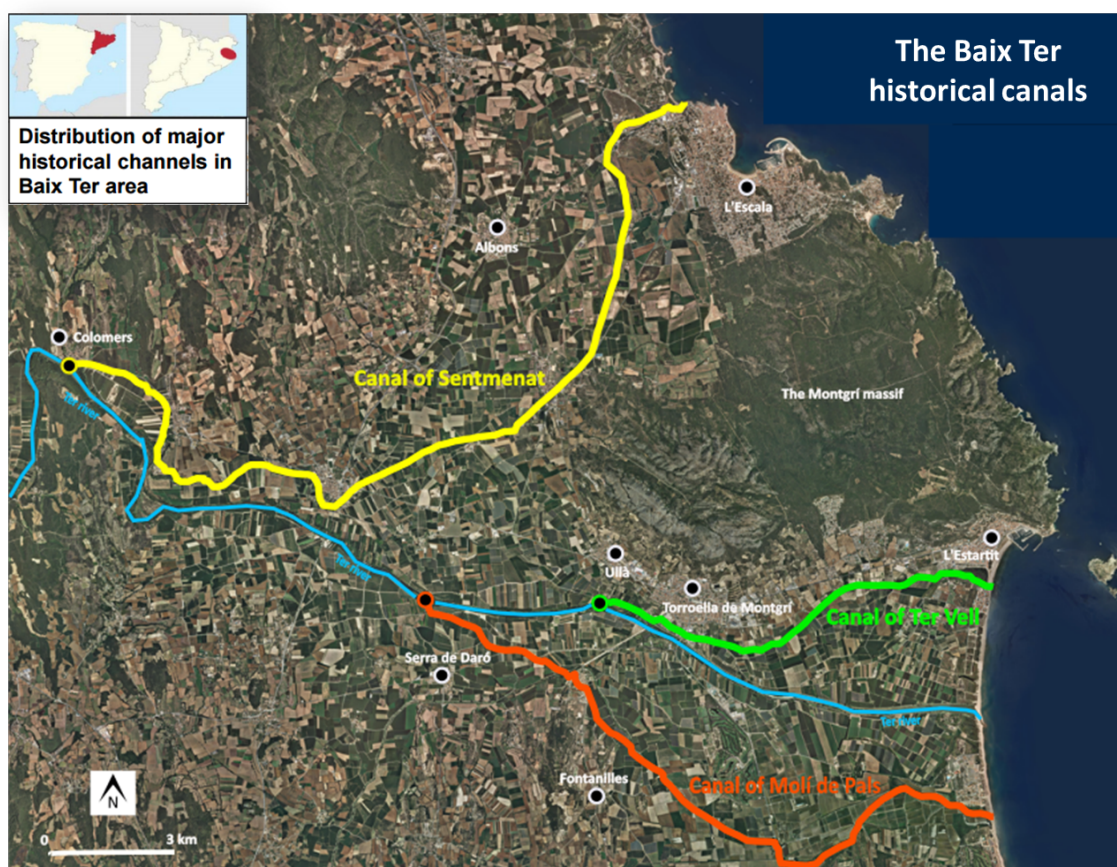


Figure 2. The main historical irrigation systems of the Baix Ter region, including the Sentmenat historical canal



Results and Discussion

Stakeholders' Discourses

In order to understand the different perspectives and interests regarding the functionality and the potential of historical irrigation canals, a representative sample of key stakeholders involved in the management of the three historical irrigation systems were identified and interviewed. The main typologies interviewed were rural administration, regional water agency, irrigators' association, municipalities, the natural park, environmental platforms, museums and foundations, among others. The main topics addressed by the key stakeholders are focused on irrigation' canals ownership and the cost of maintaining their historical infrastructure once some of them have been modernised for improving their water efficiency; their concerns about the Ter River water transfer to Barcelona area; the valuation of multifunctional use of the historical canals for landscaping and recreational uses; and the role of each key stakeholder in the promotion of the Baix Ter as a complementary tourism product of the Costa Brava. For example, the manager of the Montgrí, Illes Medes and Baix Ter Natural Park commented about the potential role of the historical irrigation canals and their ability to provide new tourism offer for deseasonalising the sun and beach tourism offer by focusing the attention on the environmental role of these canals as natural connectors of the Ter River. Another stakeholder, the environmental association Gent del Ter (*people of Ter River*) recognizes that they have felt marginalized in defending the historical irrigation systems from their ecological and social function, because water and agricultural policies are still governed by productivity schemes, with an engineering point of view and without understanding that there are natural limits that cannot be exceeded in order to guarantee the sustainability of the natural system and promote natural tourism offer. This point of view is not shared by the Irrigators' Association of Presa de Colomers and the Irrigators' Association of Rec del Molí de Pals, which recognize the environmental role of the historical canals, even though they consider that it is the Natural Park, with the support of the rural administration and water agency, who should reinforce the role of these historical canals from touristic and cultural point of view.

Cultural Heritage Identification

Up to 123 heritage items have been identified and characterized according to their tourism potential, as shown in Table 1. The results obtained for the whole of the area shows how four of eight categories account for 73% of the items, being the categories of architectural heritage, hydraulic infrastructure, natural heritage and cultural representation the most

relevant of the Baix Ter area. The results by canal shows how the main typology identified in the Sentmenat canal refers to the category of Hydraulic Infrastructure (HI) –which includes different mills, laundries and small weirs–, and followed by Architectural Heritage (AH) with 9 points of interest focused on small rural villages and churches. According to the results obtained in the Molí de Pals canal, the AH is the dominant category with 13 points of interest, while in a second place there are the categories of HI, Natural Heritage (NH) –river, naiads, ponds and estuaries– and Cultural Representation (CR) –paintings from Mascort Foundation and Irrigators Association, foundations and museums. Finally, the main cultural heritage typology in the Vell canal is NH –enclosures, fishes– followed by CR –paintings from Mascort Foundation– and HI –mills. Figures 3-5 show some graphic examples of the identified elements in each canal.

Table 1. Points of interest identified in each canal of the Baix Ter area

Typologies	Sentmenat canal	Molí de Pals canal	Vell canal	TOTAL
AH: Architectural Heritage	9	13	4	26
HI: Hydraulic Infrastructure	10	7	6	23
NH: Natural Heritage	6	7	8	21
LF: Landscape features	5	4	5	14
TF: Tangible folklore	3	2	1	6
LPS: Literature, Poetry and song	3	2	2	7
CR: Cultural Representation	6	7	7	20
HM: Histories and Memories	2	3	1	6
TOTAL	44	45	34	123



Figure 3. Examples of points of interest identified in the Sentmenat canal

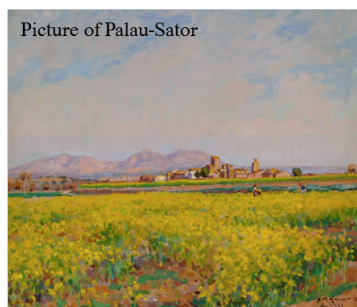


Figure 4. Examples of points of interest identified in the Molí de Pals canal



Figure 5. Examples of points of interest identified in the Vell canal



Potential Itineraries

Once each point of interest was identified and categorized from its nature, different itineraries were created in order to join them and define the basis for a tourist product able to be added to the existing tourism offer in the Costa Brava. According to this and as shown in Table 2, an itinerary is defined and clearly characterized for each canal according to different issues.

Table 2. Itineraries characterization

Issues	Sentmenat canal	Molí de Pals canal	Vell canal
Distance (km)	21,53	22,62	10,28
Starting / Ending	Colomers / l'Escala	Sant Iscle d'Empordà / Pals	Ullà / l'Estartit
Municipalities	Colomers, Jafre, Verges, la Tallada d'Empordà, Bellcaire d'Empordà and l'Escala	Serra de Daró, Fontanilles, Gualta, Palau-sator, Forallac and Pals	Ullà and Torroella de Montgrí
Counties	Baix Empordà and Alt Empordà	Baix Empordà	Baix Empordà
Tourism reference	Costa Brava	Costa Brava	Costa Brava
Included in the Natural Park of Montgrí, Illes Medes and Baix Ter	Yes	Yes	Yes



Type of road	Rural path	Rural path	Rural path
Conveyance	Cycling / By foot	Cycling / By foot	Cycling / By foot
Tourist modality	Cycling tourism / Walking / Cultural tourism / Nature tourism	Cycling tourism / Walking / Cultural tourism / Nature tourism	Cycling tourism / Walking / Cultural tourism / Nature tourism
Difficulty	Low	Low	Low
Recommended period	All the year	All the year	All the year
Services	Car parking, public shuttle, bicycle rental, accomodation and restaurants	Car parking, public shuttle, bicycle rental, accomodation and restaurants	Car parking, public shuttle, bicycle rental, accomodation and restaurants

Conclusions

Destinations serve different roles for tourists and, consequently, tourists consume destinations differently. Cultural heritage is related to an experience-based knowledge of natural resources utilization and management, an example of coexistence of territory and human civilizations. We are talking about a place where the setting would not look the same without the culture, and the latter would not look the same without the landscape. One of the main activities for including both values –cultural and landscaping– is tourism, which plays a key role in the development and competitiveness of many regions, that is, tourism includes different activities capable of providing the means by which local people and territories can be identified. In this context the need to encourage cultural diversity and promote local identity, both as touristic resource and cultural inheritance received with the obligation to safeguard and pass down to future generations becomes a priority. The obtained results from key stakeholders' interviews show there is a desire to promote the valorisation of the historical canals from their tourism potential, although doubts are focused on who should support and lead this process. This valorisation is justified on the number and range of identified points of interest in the three main historical canals of the



Baix Ter area, where architectural heritage and hydraulic infrastructure are highlighted. According to this, we consider that the cultural heritage and tourist potential of these historical canals has been demonstrated and this should facilitate, firstly, the ability to deepen into those visualization methods able to promote them within existing Costa Brava tourism offer. Secondly, the need to put in value and managing this tourism potential from the dissemination process of the itineraries as a tool for explaining and rediscover the hinterland of the Costa Brava in an integrated way with the involvement of key stakeholders. It should be emphasized that the recent piping of the traditional canals increases the risk that henceforth no one assumes its management. The loss of part of the functions performed by these infrastructures since its construction is a challenge for its conservation and continuity in the future. The irrigation modernization policies may contribute to increase the efficiency of water consumption and to offer better possibilities of permanence for the agricultural activities. However, this type of interventions shouldn't leave out other environmental and historical elements that help to structure the territory and that offer potential for local development and its heritage. We have to add other challenges for the conservation of this heritage as the dispersion and fragmentation of ownership and the need to finance fundamental intervention projects

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