

Water Narratives

Exploring the Convergence of the Canal du Midi and Its Coastal Landscape

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WATER NARRATIVES

Exploring the convergence of the Canal du Midi and its coastal landscape

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ABSTRACT: Considering ‘infrastructures as landscapes’ and ‘landscapes as infrastructures’, this article uses an open framework to reconsider the distinctive water infrastructure of France’s UNESCO-listed heritage Canal du Midi. More specifically, it profiles the Canal’s Mediterranean outlet. Viewed through a landscape architectonic lens, we investigate the canal, drawing on the theory of landscape narrative and using the illustrative method. The article identifies three crucial narratives – *infrastructural*, *natural & environmental* and *social & cultural* – that help to examine the spatial values of the Canal and its relationship with its southern coastal landscape. The study shows how the Canal du Midi has been transformed and has influenced its surroundings, becoming an integral part of the coastal landscape. We identify and analyse how the Canal functions as an infrastructure composition and an environmentally and culturally significant feature. The landscape narrative framework offers the possibility of sharpening the interpretation of water infrastructures beyond conventional problem-solving approaches by providing a holistic view of the Canal and its water landscapes. This, in turn, offers inspiration for the region’s future development, which presently prioritises the preservation of the Canal du Midi and the regeneration of the surrounding area as distinct projects.

KEYWORDS: Landscape infrastructure, illustrative method, landscape narrative, Canal du Midi, coastal landscape

Introduction

For a several decades, infrastructures have been read as landscapes and landscapes as kinds of infrastructures (Strang, 1996). The hybridisation of the two concepts seeks to redefine infrastructure beyond its strictly utilitarian definition while allowing landscape design to

gain operative force in territorial transformation processes. With flows and movements at the core, landscape infrastructures facilitate aesthetic, functional, social, and ecological relationships between natural and human systems (Nijhuis *et al.*, 2012). Infrastructures should be understood as the primary system of essential services supporting cities, regions, and nations, indivisible from their surroundings (Bélanger & Williams, 2016). Water infrastructures such as the Canal du Midi – a vast, constructed waterway built to transport goods and connect seas – have influenced regional development at a natural level, as per water flows, ecosystems, and habitats, and at a cultural level as per traditions, local economies, and identities. Building an infrastructure excludes as much as it integrates. To understand landscape infrastructure as “a live index and indeterminate interface of hard technological systems and soft biophysical processes” (Bélanger & Williams, 2016) evokes a far more complex and powerful way of knowing the world than a practical problem-solving one.

In this contribution to scholarship in the field, Canal du Midi serves the purpose of understanding the function and meaning of water landscape infrastructures by building up different narratives to allow for a more comprehensive reading of the area.

Analytical framework

In Sun (2022¹) the iconic Canal du Midi is addressed to demonstrate the importance of analysing an infrastructure as a landscape. Research for the study involved explorations of the significant relationship between the Canal du Midi’s operation as a heritage waterway and regional development, as well as the complexity of the impact of the former on the latter. The Canal spans a considerable distance, both in terms of spatial and time dimensions, crossing natural and administrative boundaries, and has been operational for over three hundred years. The Canal is not merely a component of physical space but can be considered as an organic entity that drives and is involved in local development and evolution – i.e., living heritage. However, comprehending and understanding the various connections between the waterway and the region is highly complex. This encompasses different elements and perspectives such as social, cultural, ecological, historical, and political factors, both tangible and intangible. As an outcome of the previous research, three narratives have been adopted as analytical perspectives to conduct the research and design. These are based on the perspectival switch of viewing ‘water infrastructure’ as ‘water landscape infrastructure’.

The three narratives were built on the framing of the Canal du Midi as a world heritage site. The Canal du Midi was inscribed in 1996 as “one of the most remarkable feats of civil engineering in modern times (UNESCO World Heritage Centre, n.d.). Three aspects were highlighted in the official comments of the Canal. Firstly, that the Canal “is notable as the first major summit-level canal built to meet a strategic territorial development objective”, highlighting the infrastructural functionality for a territorial strategy. Secondly, “[a]s soon as it was built, the Canal du Midi became the most striking feature of the territory through which it ran, all the more integrated into the environment as it gently modelled the

¹ A Master’s thesis entitled ‘The Canal Story: Canal du Midi – the Living Water Heritage’ was developed by Pingyao Sun and mentored by Dr. Inge Bobbink within the framework of the Circular Water Stories Lab, part of the Flowscales Graduation Studio. The studio structures the second year of the Master of Science in Landscape Architecture, Faculty of Architecture and Built Environment, Delft University of Technology.

landscape”, highlighting the natural and environmental influence of the Canal as part of the surrounding landscape. Thirdly, “[c]onstructed from 1667 and 1694, it represents a significant period of European history, that of river transport through the mastery of hydraulic civil engineering, and reprehensive of the technological breakthrough paved the way for the Industrial Revolution and contemporary technology” highlighting the socio-cultural value of the Canal linking an old era to a new one, the spirit of innovation and adventure with shared memory (UNESCO World Heritage Centre, n.d.).

Traditional perspectives on reading and understanding the Canal du Midi have focussed solely on its functioning as a piece of infrastructure. Although UNESCO's assessment of the Canal's significance as a world heritage site highlights its impact on the environment, society, and culture, there are no analytical drawings able to illustrate and support this viewpoint. By incorporating landscape architectural theories and methods such as 'landscape as infrastructure', 'landscape narrative', and 'illustrative method', a more comprehensive understanding of Canal du Midi's landscape is offered. On the one hand, landscape narrative theory helps to organise and interpret the complex landscape through different storytellers' perspectives, understood as narratives; on the other hand, the illustrative method provides a tool to visualise the water landscape of Canal du Midi. The article will concentrate on the southern coastal region of the Canal du Midi as a case study and demonstrate how narratives can be used to analyse and interpret the Canal du Midi, guiding future transformations in the area.

Landscape narrative as an unveiling tool

The theory of landscape narrative theory encompasses the reading, understanding and, thus, interpretation of complex landscapes. Narratives can be told in and by the landscape, not only serving as the background setting for stories but being a changing, eventful figure and process that engenders stories. Therefore, places configure narratives (Potteiger & Purinton, 1998). The point of view of the landscape subject, or storyteller, is essential as it holds discursive power when interpreting the meaning of the landscape. In this sense, the three proposed narratives will be written and discussed from different perspectives to reveal complementary definitions of the same piece of landscape.

Landscape narratives engage memories and ongoing cultural and natural processes while combining two dimensions: a temporal sequence of events and a nonchronological configuration that organises narrative into spatial patterns (Potteiger & Purinton, 1998). By discovering the interrelationships of spatial information and integrating them into meaningful stories, the dimension of time will also be revealed when space is analysed by employing narrative thinking. Thus, not only can spatial information about the Canal du Midi be revealed but also the temporal dimension attached to these spaces, such as seasonal alternation and historical eras. As a result, landscape architecture becomes a crucial medium to draw connections between environmental and social dynamism (Cox, 2017). As Potteiger & Purinton suggested, “[t]hrough narratives, people learn from experiences and understand landscapes”. Therefore, the narratives offered in this article can play a role in people's understanding and involvement in the landscape of the Canal du Midi.

The illustrative method and water landscape

The illustrative method is developed to analyse and communicate traditional water systems and their development through time from the landscape architectonic perspective. The term “traditional” emphasises the focus on water systems that have functioned for hundreds of years (Bobbink *et al.*, 2019, 2022). Illustration and visualisation synthesise reality, and address issues relevant to the maker, reader and viewer. The method combines multiple types of visuals like pictures, maps, diagrams, and architectural drawings (plans, sections and 3D images) and connects water systems’ spatial, social, and cultural aspects. It provides insight into unique local patterns, forms the foundation for comparative analysis, establishes knowledge, and can ultimately inform the creation of new designs (Bobbink *et al.*, 2022). The main types of drawings used within this article are a context map based on the soil types and height lines; a map framing the catchment area and climate information; drawings which show geomorphological transformation over time; and drawings that identify functionality and human activities. The method provides a rich toolbox to analyse the Canal du Midi case through drawings and serves as a base to discuss and derive relevant narratives.

The case study location is the coastal area bordering the Mediterranean Sea. Compared to the vast hinterland dominated by agricultural cultivation land, the coast is where the Canal encounters the most dynamic and complex environment featured by anthropic (urbanity, harbour, agriculture, etc.) and natural dynamics (wetlands, lagoons, sea, etc.) (Figure 1).

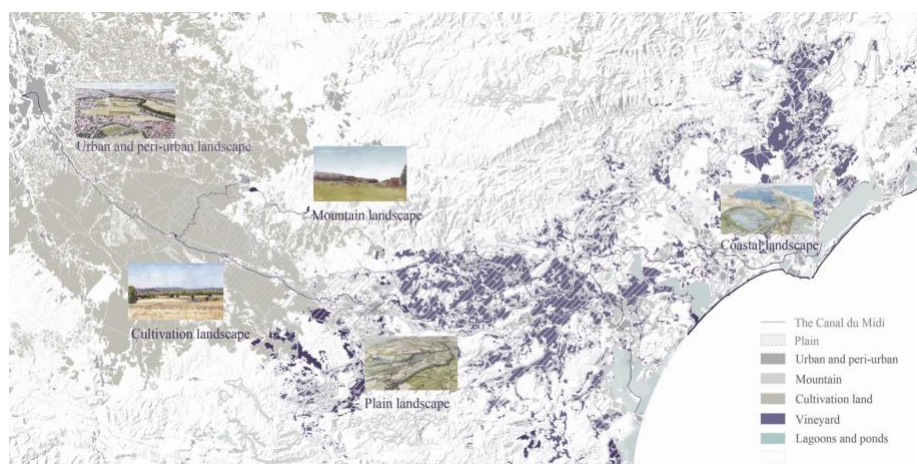


Figure 1. The landscape typology of the Canal du Midi.²

² The landscape typology of the Canal du Midi, edited from the thesis ‘The Canal Story: Canal du Midi – the Living Water Heritage’. Map made by author; Illustration source: i-pat, G. (December, 2020). Le canal du Midi, Bien du Patrimoine mondial, PLAN DE GESTION (Version finale).

The living water heritage and its context

Five centuries ago, French visionaries dreamed of a water route from the Mediterranean to the Atlantic coast (Comair & Fredrich, 2012). This waterway would enable French goods to be transported through the hinterland of Southern France without being subjected to threats from pirates or passing through the Strait of Gibraltar, controlled by Spanish and British forces (McCusker, 2006). During the 17th century, such a utopic idea was realised through the construction of the Canal du Midi. This impressive feat of engineering is one of the oldest still-functioning canals in Europe and represents a revolutionary trading waterway (Mukerji, 2021). The Canal was initially the result of the vision of one man, Pierre-Paul Riquet, who in 1662 communicated to Jean-Baptiste Colbert, First Minister of State under the rule of King Louis XIV: “about my plans for a canal which could be built in this province of Languedoc to connect the Atlantic Ocean and the Mediterranean Sea” (*France Today*, 2006).

The Canal’s monumental hydraulic infrastructure straddles half of south France, crossing two administrative regions, Midi-Pyrénées and Languedoc–Roussillon (Figures 2 & 3). The Canal has a total length of 360km (278 km of canals and 82 km of water supply system) and includes 328 hydraulic works (staircase locks, aqueducts, siphons, spillways, feeders, dry docks and a tunnel) overcoming 246 metres of height difference (Borjon, Colin, Cotteret & Breant, 2020). It took 14 years (1667 - 1681) to complete the main structure (Figures 3 & 4). Still today, its waterworks support and maintain navigation and irrigation, demonstrating how French civil engineering expertise has manipulated the landscape and waterscape of southern France. Given their long tradition of agriculture, the Midi-Pyrénées and Languedoc-Roussillon regions had many resources, such as wheat, wine, woollen cloth, silk, olive oil, and salt, which producers were struggled export due to a lack of trade (Cotte, 2003). Since 1681, the Canal’s water conservancy facilities have enabled cargo and freight transportation, allowing it to exchange goods and resources with the broader world.

Such a work of engineering consolidated the royal power of King Louis XIV and promoted the French economy by creating a span of waterways joining the two seas (Sun, 2022). For this reason, it is often called the ‘Canal des Deux Mers’ (Canal of/between Two Seas) (Jefferson, 2009). The Canal’s two outlets, the Mediterranean and the Atlantic coastal regions, allow openings and passages through the whole Mediterranean basin towards North Africa, the Middle East and Western Asia, and through the Gironde estuary towards the United Kingdom, the countries of north-western Europe and the African and American continents. The two mouths are the basis for establishing the dream of the Canal du Midi as a route to access the “Seven Seas”³.

³ “The Seven Seas include the Arctic, North Atlantic, South Atlantic, North Pacific, South Pacific, Indian, and Southern oceans.



Figure 2 – The continental location of the Canal du Midi/Canal des Deux Mers.

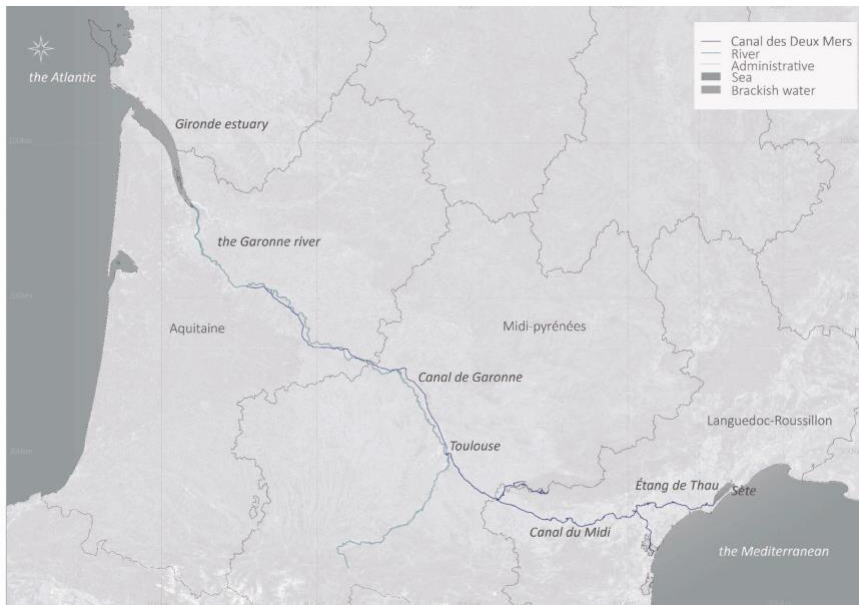


Figure 3 - The regional location of the Canal du Midi.⁴

⁴ National boundary information based on: World Countries (Generalised). (n.d.-b). <https://hub.arcgis.com/datasets/esri:world-countries-generalized/explore> - administrative information based on BD TOPO® Géoservices; base map revised from Google Map.



Figure 4 - Map of the Royal Canal of Languedoc (Canal du Midi) by J.B. Nolin (1697).⁵

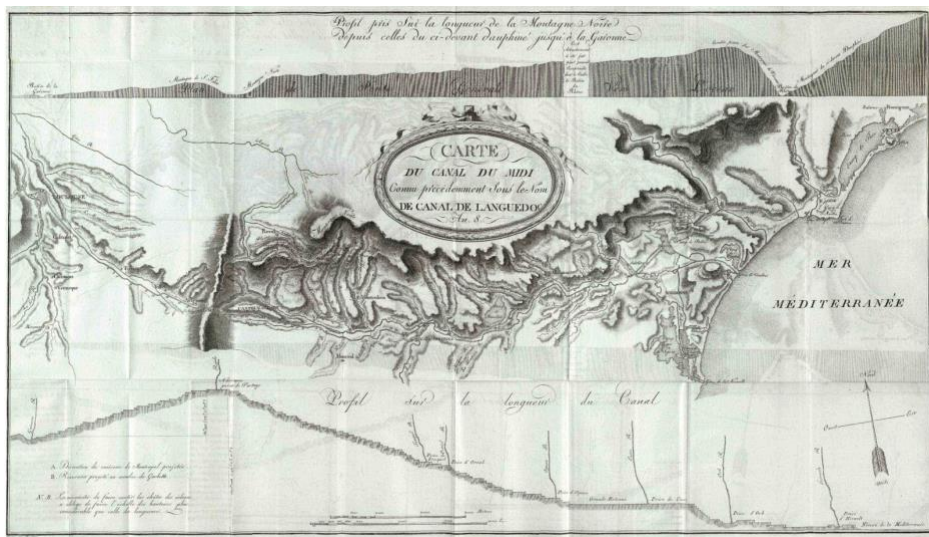


Figure 5 - Historical map illustrating the plan and section of the Canal du Midi (Toulouse to the Mediterranean Sea).

The two outlets of the Canal du Midi belong to two hydrologic regions surrounded by several mountain massifs: the Pyrenees in the south, the Massif Central in the northwest, and the Montagne Noire in the southeast. To cross them, the Canal du Midi must negotiate the high area between two valleys through the Seuil de Naurouze. With the Seuil de Naurouze as the watershed, the Canal du Midi flows in two different directions: towards

⁵ https://www.davidrumsey.com/luna/servlet/detail/RUMSEY~8~1~296098~90067587:Le-canal-royal-de-Languedoc%2C-pour-l?sort=Pub_List_No_InitialSort%2C-Pub_Date%2C-Pub_List_No%2C-Series_No&qvq=q:canal%20du%20midi;sort=Pub_List_No_InitialSort%2C-Pub_Date%2C-Pub_List_No%2C-Series_No;lc:RUMSEY~8~1&mi=0&trs=3

the South, flowing to Port de Sète through the Étang de Thau (a large saltwater lagoon) into the Mediterranean Sea (the case study area); and towards the North, flowing to Toulouse (Sun, 2022) and then through the Canal de Garonne and the Garonne River to Bordeaux port, the Gironde estuary and into the Atlantic Ocean (Figure 5).

Close to the coastal area, the Canal du Midi runs parallel to the coastline of the Mediterranean Sea. The site is characterised by lagoons, salt marshes, and sandy beaches, constantly replenished by rivers and runoff from the more mountainous northwestern region. The typical environmental character is a result of the Mediterranean climate associated with frequent hot and dry days in summer and heavy rain in winter (Joly *et al.*, 2010). This climate and topographic conditions create a high flood-risk area that the Canal passes through. Agriculture, especially vineyards, can be found along the rivers and the Canal, which are closely related to the Canal's wine trading business and irrigation system. The coastal city of Agde, the last important resting and supply station before cargo ships sailed out to sea, is situated at on slightly higher terrain. Forests, Mediterranean shrubs, meadows, and other natural or semi-natural green spaces are distributed in the gap between cities and agriculture. The distribution of natural green spaces in the area is relatively high. In the shore part, the Canal traverses the entire wetland and part of the lagoon until it reaches the monumental lighthouse, the Phare des Onglous (Figure 6).

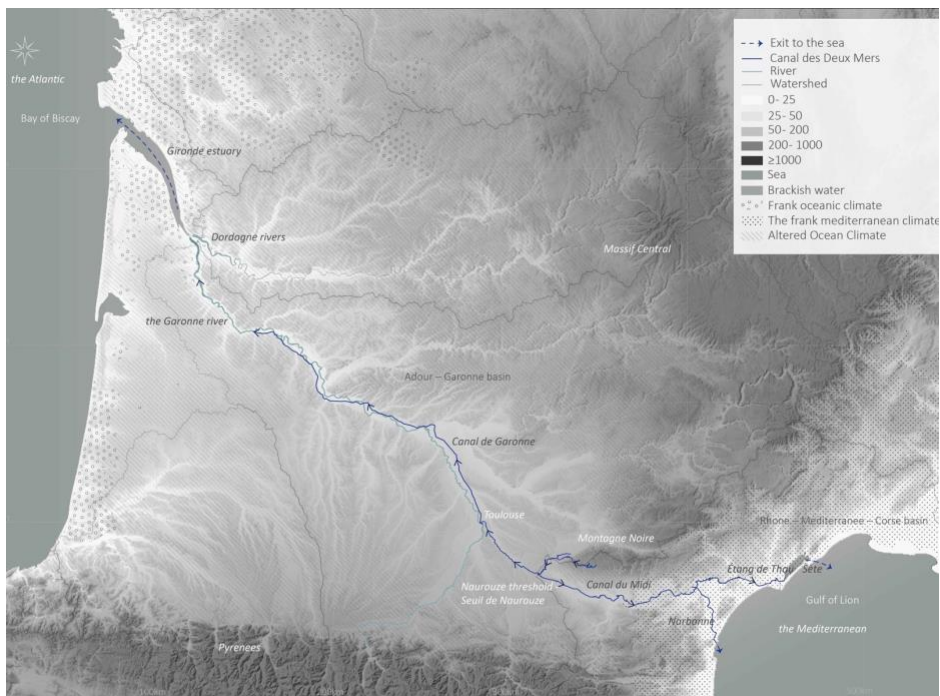


Figure 5 - Map of the natural and geographical landscape of the region (Andréossy, 2014, p.xiii)

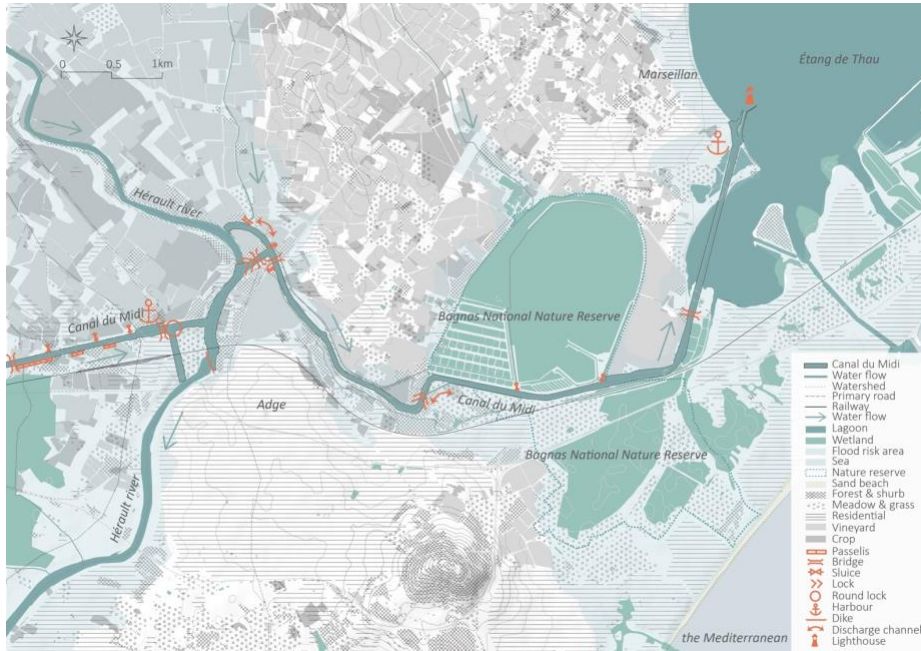


Figure 6 - Map of the southern coastal section of the Canal du Midi.⁶

Water management – the infrastructural narrative

The infrastructure narrative emphasises the Canal's navigation and irrigation functions and the built components that ensure these functions. Due to the period in which they were built and the project's endeavour, this infrastructure is well-articulated and solidly part of the Canal's heritage. To help understand and visualise these functions, the illustrations delve deeper into specific sites – the Passelis, the Round Agde lock, the convergence between Canal du Midi and Hérault River, the Prades lock and the Bagnas lock (Figure 7).

Site 1 (the Passelis) combined the drainage, flood discharge, and passage function. On the north side of the canal, a small sluice allows the water from the agricultural land to flow into the Canal du Midi when needed. On the south side are some spillways, the longest of which has 47 spans (L'Officiel du canal du Midi, 2012). These spillways, so-called *passelis*, allow the canal water to flow over the flat land before running through a ditch when water levels are high during the flood season. The bridge behind the spillway, the Pont Saint-Joseph, has also been carefully designed to allow navigation. The highest opening in the middle is for boats; one of the bridge openings was built in the spillway, where stones on the culverts were cut with an upward bill on the sides of the towpath to retain a thick layer of gravel. Such specific design allowed the horse-drawn vessels to traverse the Canal.

⁶ Drawn by the author, elevation information based on EU_DEM; watershed & waterway information based on VNF; Land use based on BD TOPO® Géoservices.

Sun, Bobbink & Chouairi: Water narratives – The Canal du Midi

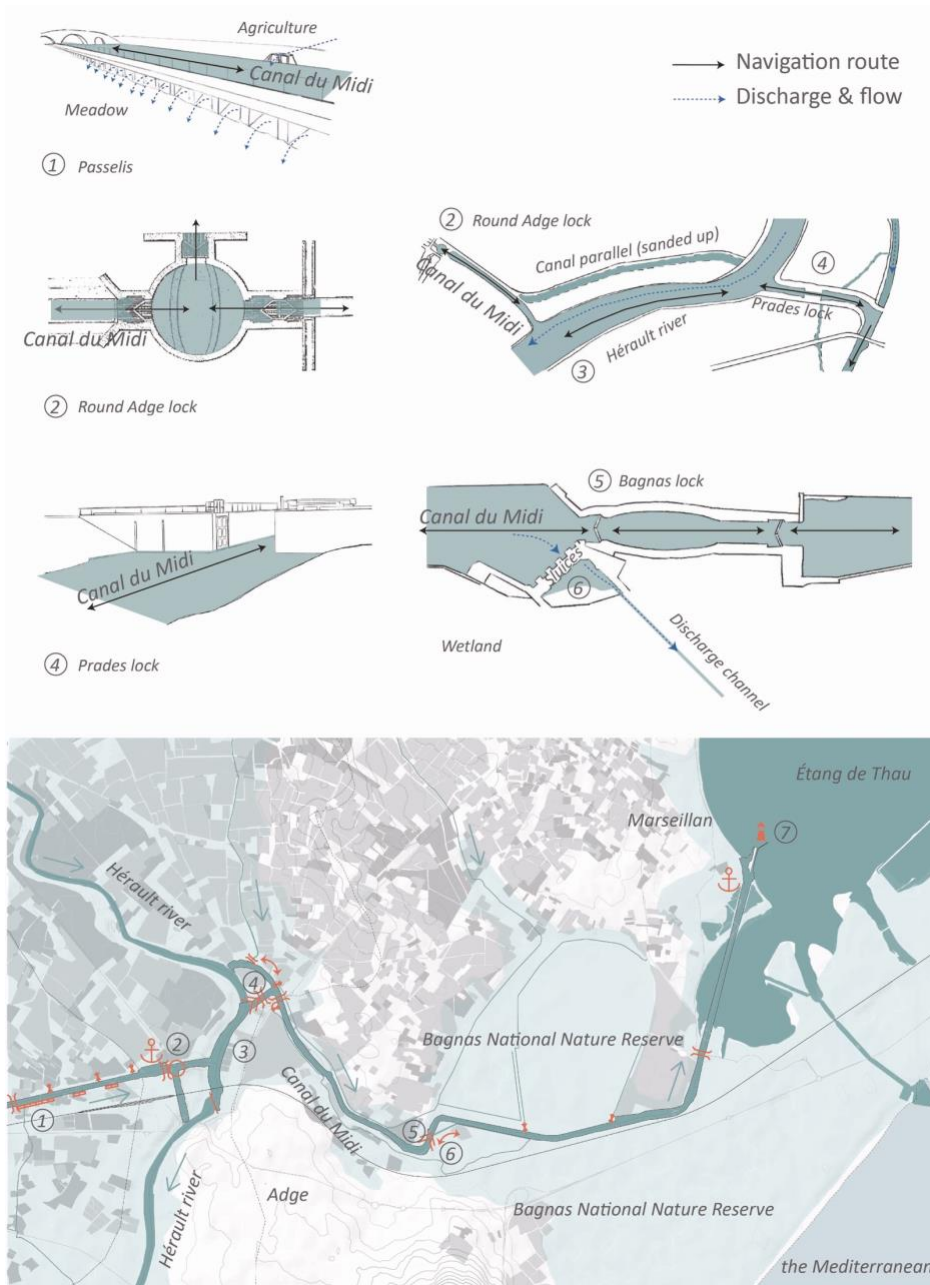


Figure 7 - Water management.⁷

⁷ Drawn by Sun. Information based on Google map, VNF, Le Canal du Midi de long en large, Canal du Midi - Canal Royal de Languedoc. (n.d.). ② Round Adge lock revised from File: CdM - Ecluse Ronde D'Agde.jpg - Wikimedia Commons, 1697

To cross the Hérault River, many intriguing elements needed to be designed (a combination of sites 2, 3, and 4). Firstly, the Round Agde lock is the only round lock in the Canal du Midi. It has a very ambitious and unique design: the round shape serves three different water levels and allows ships to turn around. It is like a combination of a modern roundabout for traffic with an addition of three locks. The water level of the Hérault River is slightly higher than the water level in the Canal. Moreover, the water of the Hérault River contributes to the Canal's water supply (L'Officiel du canal du Midi, 2012). The middle level goes towards the West, and the lowest level is the one that connects to the South, towards Agde. After crossing the round lock, the Hérault River forms an obstacle for the Canal du Midi; the water level difference between the river and Canal is not high enough to allow for an aqueduct, thus for around 300 meters, the Hérault River becomes part of the Canal. The Prades lock is a guard lock, which means that it is intended to prevent the waters of the Hérault River from flowing into the Canal. Unlike the other locks, the Prades lock is usually open; only when the Hérault River has high water is it put to work. The Prades lock works with the Agde Round lock to maintain the Canal water level. The Canal reaches the sea at Site 5, the Bagnas lock, and Site 6, the discharge channel. The latter is equipped with four sluice gates that can divert the water from the Hérault River by channels that can irrigate the agricultural fields (Le Canal L'Officiel du canal du Midi, 2012) and flood the wetland.

The infrastructural narrative is thanks to the Canal's innovative design, which is engaging and recognisable. The designers at that time carried out localised adaptation and innovation according to the characteristics of the coastal environment to precisely guide the water. The narrative not only demonstrates the ambition of humans to cross natural barriers but also demonstrates how to compromise with local conditions through creative and flexible design.

Water dynamics – the nature and environmental narrative

Narratives concerning nature and the environment are seldom considered in conventional descriptions of engineered infrastructures that are frequently shown as obstacles and challenges that must be solved technically. However, nature is the foundation of any intervention and reflects the essential and spatial morphological relationship between the natural and the anthropic landscape. In this narrative, the relationship between the Canal water and the surrounding natural water system, as well as the agricultural land and the flora and fauna that inhabit is emphasised in Figure 8.

In site 1 the *passelis* has been designed to adapt to this low and sometimes flooded environment. This particular spillway only appears in this landscape and differs from other spillways in the hinterland region. The design has influenced the surrounding environment by creating a wet zone. The axonometric section A – A' demonstrates that while the water from the higher ground paddy field flows into the Canal, the flat land beside the *passelis* (mainly meadow, with shrubs, trees and a wetland area in the south) remains as a floodplain, creating a rich habitat for flora and fauna.

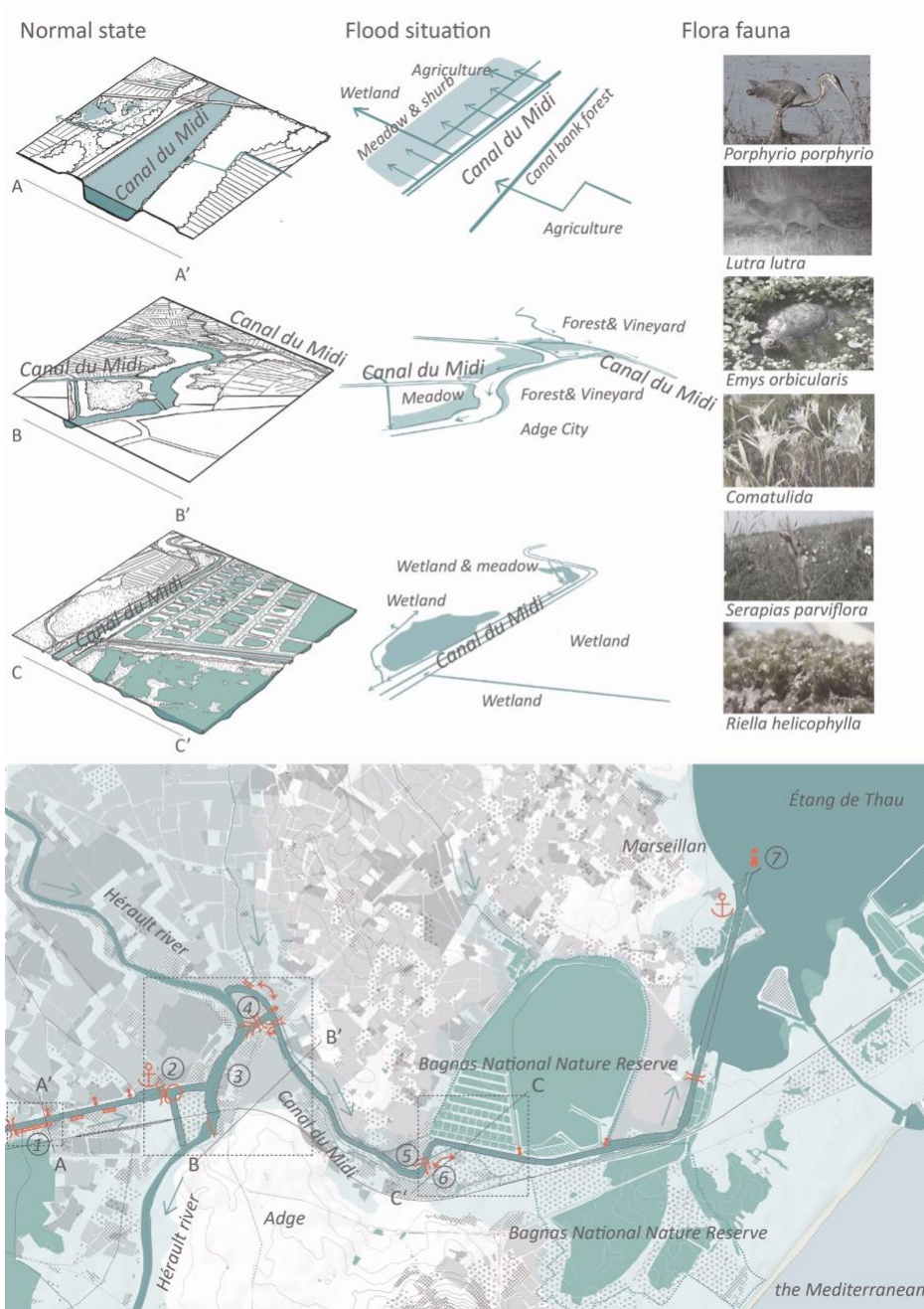


Figure 8 - Water dynamics.⁸

⁸ Drawn by Sun. Information based on Google map, VNF, Le Canal du Midi de long en large, Canal du Midi - Canal Royal de Languedoc. (n.d.).

In sites 2, 3, and 4, in the location where the Canal intersects with the Hérault River, the canal and the river merge because it is impossible to construct aqueducts on the low terrain. The axonometric section B – B' shows that the river connects the Canal at site 2 and becomes one of the canal's water sources; excess canal water can flow back into the river by flowing through a canal tributary towards the city of Agde. In site 4, another canal tributary is intended to divert a certain amount of the river's water and collect upstream runoff that disperses through the crop fields to decrease the volume of the central Canal watercourse. Two expansive green areas that may be submerged seasonally along the water's edge provide animal habitats and vegetation around these water systems. This design, which is closely tethered to the natural environment, offers sufficient adaptability to the drought and flood challenges in the Mediterranean region and creates more ecological spaces surrounding the Canal.

At sites 5 and 6, which comprise the last lock connecting the canal with the sea level (Écluse De Bagnas - Canal Du Midi, n.d.), the Canal runs through the Bagnas nature reserve. The reserve is a vital wetland environment constituted by diverse natural habitats such as the brackish water pond and lagoon, the reed bed, freshwater environment (canals and breeding ponds), salt meadows/grasslands and dune. The axonometric section C – C' shows the discharge channel that water from the Canal du Midi can flow through into the wetland area on the south side of the Canal, while the water from the wetland in the North can flow into the Canal du Midi. This water exchange system has connected the Canal and the nature reserve as one integrated organism that is home to various flora and fauna, including some distinct local species. 572 plant species have been identified, including scarce plants linked to temporary Mediterranean lagoons such as *Althenia filiformis* or the bryophyte *Riella helicophylla*, both of which are protected. For fauna, 9 species of amphibians, 30 species of mammals, 25 species of fish and 418 species of insects have been found in the nature reserve. It is the temporary home to many waterbirds who spend the winter there, and it is also an important breeding site for many animals, especially for ardeids such as the purple heron (*Ardea purpurea*), the cattle egret (*Bubulcus ibis*) etc. Another emblematic species nests in the reedbeds of Grand Bagnas: the purple swamphen (*Porphyrio porphyrio*). The marine environments of Bagnas are also home to the endangered European otter (*Lutra lutra*). Among the reptiles present on the reserve, the European pond turtle (*Emys orbicularis*) is one of the most notable. A population of this aquatic turtle species is maintained in a Canal bordering the Grand Bagnas (ADENA, 2021).

The natural-environmental narrative shows that the Canal du Midi has integrated into a dynamic system where water levels vary through seasons and years. The Canal waterworks are connected not only to other watercourses but also the natural systems like nature reserves. On the one hand, the Canal and its surrounding environment have conflicting interests: the Canal may introduce foreign species while water flooding from the adjacent rivers could damage the canal. On the other hand, rivers provide water for the Canal, and the canal and its floodplains offer unique habitats for various species. Overall, the Canal and the natural environments constitute one ecosystem.

Water memories – the social and cultural narrative

The social and cultural narrative interprets the waterscape from histories, social-economical systems, and aesthetic perception that forms the “genius loci” (Norberg-Schulz, 1980) or ‘identity’ of the place. Being a UNESCO World Heritage site, the Canal can be seen as an expression of various ways of living with water passed on from generation to

generation. These manifest, expressed in both tangible, physical objects, like waterworks and other sites or in intangible forms, like social practices, events, knowledge, representations, beliefs, traditions, lifestyles, etc. (Cultural Heritage, 2023b) (Figure 9).

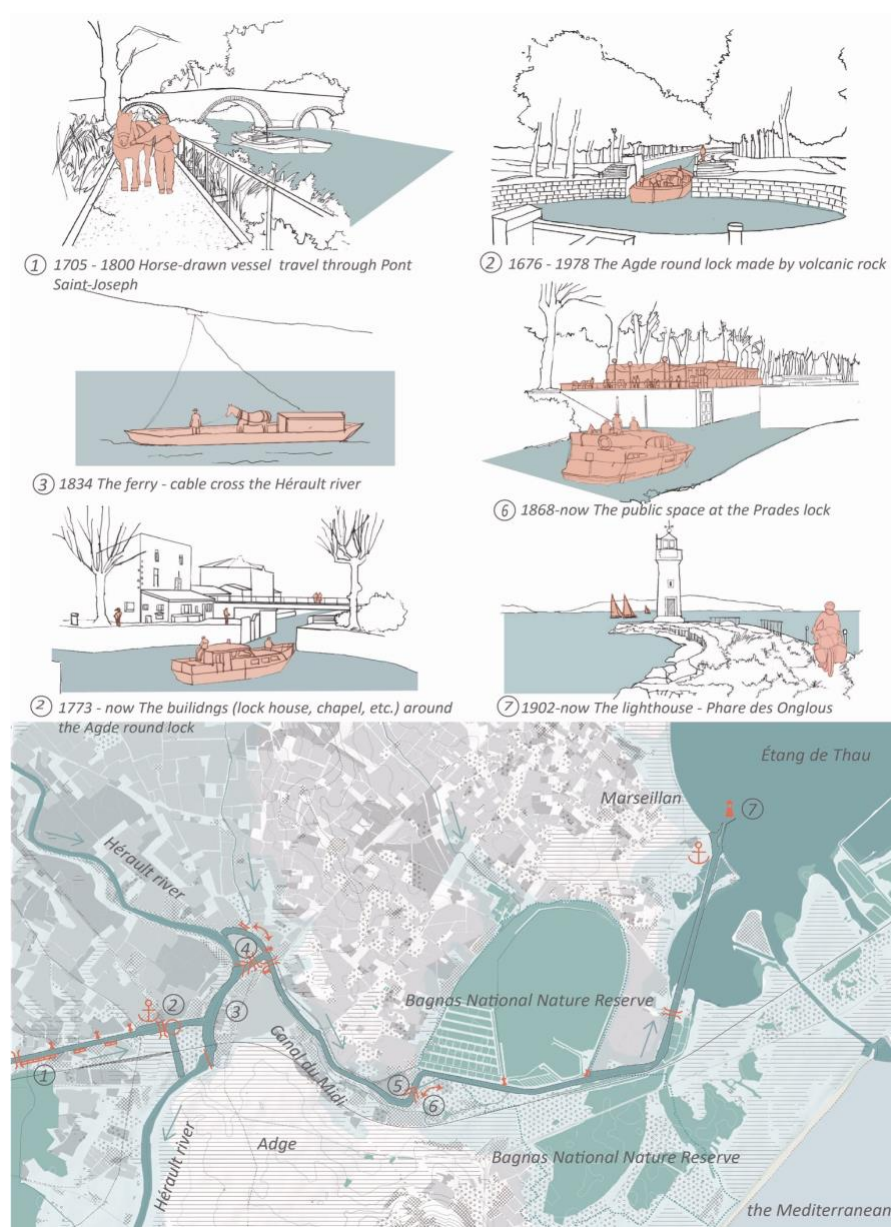


Figure 9 - Water memories.⁹

⁹ Drawn by Sun. Information based on Google map, VNF, Le Canal du Midi de long en large, Canal du Midi - Canal Royal de Languedoc. (n.d.).

In the case of site 1, the spillway along the water bank created a serene path alongside the green canal, adorned with majestic trees and vibrant flora. In horizontal order (as in Figure 9), the waterworks (Pont Saint-Joseph) distributed on the canal constitute the focus of the vision and some wild shrubs and agricultural landforms constitute the background. Integrating the facility's structure with the environment creates the Canal's picturesque aspect as a cultural landscape. In addition to depicting the view, this composition also reveals how the Canal has been used historically, with a towpath to facilitate horse-drawn vessel travel (a traditional means of navigation reflecting industrial techniques and lifestyles during the 18th century). Moreover, it provides an appealing route that now allows today's visitors to travel along a short section of the Canal by bike or on foot.

Site 2, the Agde round lock, famous for its unique design, is also a tourist attraction. Apart from its engineered design, the locks' material is also striking. The black volcanic rock used to construct the lock comes from a nearby quarry and is also used in the construction of houses in the city of Agde and in many of constructions along the coastal region.

Initial constructions around the area of the round lock included an administration building, stables, shops, and a chapel built in 1773 to provide a space for travellers to pray (Chandra, 2009). On the left bank of the Hérault River dike there is a building that has been used successively as a flour mill (for the grain from nearby agriculture field), as a power plant that opened in 1885, a sardine cannery in 1962-1979, and a multipurpose hall since 2010. The Hérault River route makes it possible for today's boats to pass through the lock, while during the 19th century, a ferry-cable was used to guide the ships and people over 600 metres to cross the river (L'Officiel du canal du Midi 2012).

Site 5 and site 6, the Prades lock, provides an appealing public space near the waterside, where people can imbibe, watch the boats and enjoy the view. Site 7, the Phare des Onglous lighthouse, is where the Canal watercourse finally reaches its end at Étang de Thau, a narrow strip of land between the lagoon and the Mediterranean Sea. The lighthouse serves as both a functional and symbolic element, guiding the direction of boats and opening up the possibility of international travel via maritime trade routes.

The social and cultural narrative of the Canal du Midi is closely related to how people once used the canal and how knowledge, traditions and activities have evolved. The cultural landscape of the Canal exists through the superposition of various local landscape factors. At the same time, the Canal is the carrier of history, memory, and transformative processes. In addition, the cultural influence of the Canal is wider than the Canal itself: neighbouring towns (such as Agde), people's lifestyles (such as public activities along the Canal), economic products (such as wine), routes, and service facilities (such as chapels and mills) are all part of its cultural story. Thus, to empower the value of the Canal as a cultural heritage, the whole landscape system, including tangible and intangible elements and people's perceptions, must be included in the narration.

Conclusion

Through a landscape architectonic approach, valuable insights and details were collected and composed on how the Canal was designed, its locations and developments over time.

The illustrative method demonstrates and interprets three different readings (stories) through the mutual employment of drawings and texts. The outcome of the research displays how the Canal du Midi is functionally part of a wider coastal water landscape functionally, environmentally, and culturally. Different focus areas have been analysed through the various narratives to provide knowledge about the water landscape the Canal du Midi created. Studying the Canal in this way means understanding it as part of the wider landscape and understanding the coastal landscape as an integral part of the Canal.

By understanding the three narratives and the way they interact, we can comprehend the complexity of the influence the Canal has generated, enriching our reading of it as a water landscape infrastructure. The infrastructure narrative serves as the skeleton of the system operativity; the nature and environmental narrative reveals the mutual support and adaptation relationship between the function and the environment; the cultural narrative draws back memories, history, rituals, and the daily life of people who have used it. Much landscape information that could support the future transformation of the area could be obtained by combining knowledge from the three narratives and discovering their relationship, supporting the emergence of an integrated landscape infrastructure system. In this system, the multifunctionality and multiconnectivity of the Canal are revealed as central to the development of the coastal area. For example, the spillway is commonly known for its function to release water at times of high capacity, but the system shows it can also create significant natural value by irrigating paddy fields and wetlands, providing places for public recreation and appreciation.

In terms of future waterway and waterscape design, understanding the system can help identify the impact of changes to landscape elements, and the impact on associated infrastructure and also with other landscape stakeholders. Thus, such an approach could work as an essential tool to communicate with different stakeholders, including 'silent' ones such as flora, fauna and further intangible stakeholders such as lifestyles and memories. In addition, the specific coastal lowland conditions, including drought and flooding, played a crucial role in the design of the section of the Canal du Midi. Thus, possible changes in coastal conditions, such as hotter weather and mean sea level rise, must be considered in further transformations. Careful readings of narratives require always taking such processes into account, acknowledging that while seasonality is a circular system the timeline is a linear one, perpetually leading a solid past to possible futures. Figure 10 summarises the whole process of how the Canal du Midi has been analysed as a water landscape to inspire future transformations for the area. The framework can help to gain operative force in territorial transformation processes and can also be used for other landscapes. By employing it, landscape analysis is enriched and goes beyond solving problems.

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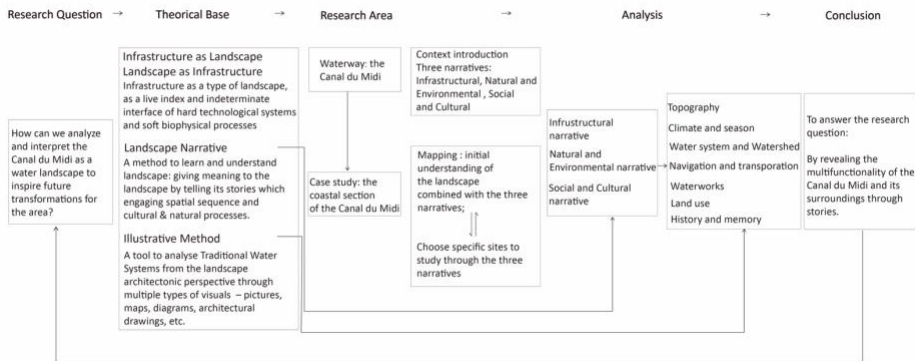


Figure 10 - Framework diagram: From water infrastructure to water landscape

In the research presented in this article, the analysis involves engineering, environmental ecology, geographical science, social economics, history, and other disciplines. As Bélanger and Williams (2016) identified, the complexity of knowledge cannot be achieved by one person or people of one discipline. However, as a discipline of spatial design, landscape architecture can provide extensive information through intuitive and rich drawing tools. Drawing can not only be used as a means of analysis but also as a tool for communication with different professions and public. Therefore, building a framework that integrates the comprehensive knowledge of various disciplines is essential. The analytical drawing produced with the help of the framework provides a first step and needs others to elaborate on to make the stories come to life in the future.

REFERENCES:

- ADENA. (2021, October 8). La faune et la flore - Réserve naturelle du Bagnas. ADENA. <https://www.adena-bagnas.fr/la-reserve-du-bagnas/decouvrir/faune-et-flore/>
- Bélanger, P., & Williams, R. H. (2016). *Landscape as infrastructure: A base primer (1-1)*. Routledge. <https://search.ebscohost.com/login.aspx?direct=true&scope=site&db=nlebk&db=nlabk&AN=1417432>
- Bobbink, I., Chouairi, A., & Nicola, C. D. (2022). Visualizing water: Using the illustrative method to learn from long-lasting water systems. *Blue Papers*, 1(1), Article 1.
- Bobbink, I. (2019). Testing the illustrative method: How to reveal hidden knowledge stored in traditional water systems - Lessons from the past, visions for the future. <https://repository.tudelft.nl/islandora/object/uuid%3A50a936d4-6803-4489-9do4-44f4cefda1a6>
- Borjon, M., Colin, M., Cotteret, C., & Breant, L. (2020). *Le Canal du Midi, Bien du patrimoine mondial (Plan de gestion)*. Préfet de la Région Occitanie et Groupe de Recherche Art Histoire Architecture et Littérature
- Comair, G., & Fredrich, A. (2012). From sea to shining sea: 17th century French Canal du Midi. *World Environmental and Water Resources Congress 2012: Crossing Boundaries*. <https://ascelibrary.org/doi/10.1061/9780784412312.105>
- Cotte, M. (2003). *Le Canal du Midi: Merveille de l'Europe*. Herscher-Belin.

- Cox, A. (2017, April 5). Landscape as narrative. *Foreground*.
<https://www.foreground.com.au/culture/landscape-as-narrative/>
- Écluse de Bagnas - Canal du Midi. (n.d.).
<https://www.canaldumidi.com/Biterrois/Agde/Ecluse-de-Bagnas.php>
- France Today editors. (2006, May 17). History of the Canal du Midi. *France Today*.
<https://francetoday.com/learn/history/history-canal-du-midi/>
- French-waterways.com. (2023, June 8). Canal du Midi |- Detailed navigation guide and maps. <https://www.french-waterways.com/waterways/south/canal-midi/>
- Jefferson, D. (2009). *Through the French canals*. (12th ed.) Adlard Coles.
- Joly, D., Brossard, T., Cardot, H., et al. (2010). Les types de climats en France, une construction spatiale. *Cybergeo: European Journal of Geography*.
<https://doi.org/10.4000/cybergeo.23155>
- L'Officiel du canal du Midi. (2012). Le Canal du Midi de long en large. <https://www.plan-canal-du-midi.com/le-canal-du-midi-de-long-en-large/>
- McCusker, J. J. (2006). *History of world trade since 1450*. Thomson Gale.
- Mukerji, C. (2021). *Impossible engineering: Technology and territoriality on the Canal du Midi*. Princeton University Press.
- Norberg-Schulz, C. (1980). *Genius loci: towards a phenomenology of architecture*. Academy Editions
- Nijhuis, S., Jauslin, D. and de Vries, C. (2012) Flowscapes: Infrastructure as landscape, landscape as infrastructure: Graduation lab landscape architecture semester guide 2012-2013. Delft University of Technology
- Potteiger, M., & Purinton, J. (1998). *Landscape narratives: Design practices for telling stories*. J. Wiley.
- Strang, G.L. (1996) Infrastructure as landscape (Infrastructure as landscape, landscape as Infrastructure). *Places 10*(3). <https://escholarship.org/uc/item/6nc8k21m>
- Sean. (2018, August 9). The Seven Seas: A sailing legend. San Diego Sailing Tours.
<https://sandigosailingtours.com/the-seven-seas-a-sailing-legend/>
- Sun, P. (2022). The canal story: Canal du Midi – the living water heritage. Masters thesis, Delft University of Technology.
<https://repository.tudelft.nl/islandora/object/uuid%3A915a281e-7e97-4bcf-9244-f676884957f3>
- UNESCO (2023). Cultural; heritage. UNESCO UIS. <https://uis.unesco.org/en/glossary-term/cultural-heritage>