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# MAPPING THE MEDITERRANEAN THE DESIGN THIRD SPACE

# The Seascape beyond the Physical Dimension.

## How Data Design could Display Complex Marine Environments

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### **Keywords**

Landscape Architecture, Data Design, Data Visualization, Liquid Landscapes, Ephemeral Elements, Design of Ephemeral Elements.

### **Abstract**

The paper addresses a reflection and explores the intangible dimension of the Mediterranean Sea, in other words everything that lies beneath and above the surface of the water. Reasoning on how this hidden dimension is a well defined landscape outlined by many scientific studies due the complexity not always accessible. The attempt to draw a palimpsest of levels for the understanding of this liquid volume inevitably passes through the design of tools needed to understand and study the raw data and how it can serve to build a “physical story” useful to tell and reveal what is not perceptible to the naked eye. The effort is to hybridise the scientific disciplines of landscape architecture and data design, indeed the understanding of physical dynamics and how they can be returned in physical form, in order to open a strand of research in support of certain scientific disciplines such as marine biology, meteorology or physics of marine environments and so on. Moving from these premises and in order to validate the proposed, some examples are presented which give evidence of how data design and analytical sensitivity can merge starting from scientific assessments.

## 1. Introduction<sup>1</sup>

The *European Landscape Convention* defines landscape as “a specific part of the territory as perceived by the population, whose character derives from the action of natural and/or human factors and their interrelationships” (ELC, 2000).

This designation identifies as factors affecting the forms of the landscape both the character of the anthropic changes exerted on the territory and what is perceived by those who live it. While the anthropic load is less evident on the seas than on land, this very definition of landscape can also be associated with the liquid territory of the Mediterranean.

Today, the elaboration of datasets, as a result of accurate monitoring and environmental surveys, even in real-time, is able to provide the quantitative geographies of the transparencies of the Mediterranean landscape. In this regard, the contribution considers the use of capability of design in providing spaces for narrating data that can free the datasets from the tabular grids and give the unpublished data vital environments through which to express themselves.

It is possible to think of the resulting communicative and interactive artefacts as the rendering of an intersection of different discourses and languages. In this regard we obtain the convergence of landscape architecture and data design, through a circular process of transdisciplinary exchange of tools and contents. In the intersection between different fields of research there are substantive communication paths

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1. This work was conceived and produced in its contents by the two authors. Matteo Aimini has produced paragraphs 2, 3; Lucilla Calogero has produced paragraphs 4, 5; both authors contributed to the production of paragraph 6.

where visual, physical, textual, static or dynamic forms and languages merge and interact with each other, illustrating each other.

## **2. The complexity of the non-visible elements of the sea landscape**

The landscape architecture works in territorial environments that display complex physical characteristics of natural and artificial type. The interaction between these last components determines the soul of the landscape that we can perceive both with the naked eye and with the help of relevant instruments available to us. The recognition of these ecological areas has long been a codified and variable process (Makhzoumi & Pungetti 1999; Chen et al., 2006; Tugnoli, 2015), structured according to a process of empirical and deductive decoding. This process brings into play various cognitive devices: from cartography to drawing, from taxonomic tools for complex environments to the register of anthropic interactions, also through interviews with the populations that experience it daily. This set of information is crucial in defining a landscape, that is “Landscape means an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors” (European Landscape Convention, article 1 paragraph a).

The understanding of the landscape elements and their interactions expressed through scientific classifications are propaedeutic, depending on the type of question, to a sensitive and effective project for the (built) environment, capable of acting in an accurate and rigorous manner, both for the

treatment of endangered situations, and in the transformations that also imply other factors of a more aesthetic nature. The research and the practices of the landscape project, even if they are heterogeneous because of the involved scales and contents, can be listed in different categories and families – among the best known we can mention the project of ecologies for the urban fabric (Mostafavi & Doherty, 2006); the landscape as a form for territorial structures (Waldheim, 2016); the ability to regenerate landscapes through environmental strategies (Corner, 1999).

The results of the aforementioned practices are generally measured in decades and are mostly visible in the environments and territories that our gaze, used to a positive three-dimensional vision (the perceived extruded), can detect and fathom according to principles which have been codified for centuries. What happens when using the same approach, we shift our gaze towards the end of the known, towards the physical limit imposed by the geography that makes us grasp the liquid two-dimensionality of the Mediterranean Sea at the edge of the coast?

Almost everything is known about land, thousands of treaties, tools and devices have been produced to represent the complexity of the natural and built world. First of all, our view which, if trained, is able to analyse and elaborate the morphology of what is observed through cognitive logical processes. However, there is also a hidden underworld, the result of the layers of civilizations that have settled in the world and which is systematically revealed, by means of ab-

duction and excavation operations, by the numerous archaeologists active on the planet. This is generally true for 29% of the earth's surface, while for the remaining quantity, made of the planet's hydrosphere (Shiklomanov, 1999) it is as if we suddenly become blind and lose the spatial beliefs which are typical of terrestrial mammals.

The void, the liquid cast that covers the Mediterranean basin, seems to appear like another planet, where even the laws of terrestrial physics go in derogation. It is a territory inhabited by other species, not only animal and vegetable but also other species. The landscape architecture, with its sophisticated system of interpretations and precognitive design methods for the built environment, ends where the *tabula liquida*<sup>2</sup> begins. The result is the sensation of being powerless in front of the infinite scale and with the feeling of not being able to control, as is happens on land, the natural elements we are used to manage – often in a predatory way (Baichwal, De Pencier & Burtynsky, 2018). This sensation of powerlessness generates the possibility – which is even provocative when we consider the need to deal more closely with the seascape for obvious reasons, especially climatic ones – of rethinking the figure of the landscape architect. Today the landscape architect refers above all to the terrestrial landscape and is called to work on the boundary environments between the elements, such as the coasts, trying to focus the designer's attention on the sea-

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2. The *tabula rasa* was the tablet that the Romans used to write and overwrite information and data, it was a useful tool for learning but also for work. Thus the term *Tabula Liquid* metaphorically indicates the plasticity of the sea surface and the possibility of writing information, of the data it contains underneath, like the marks left by the stylus on the wax.

scape. The marine landscape architect<sup>3</sup> would not be required to focus his work on the modelling of the built environment, but towards a project concerning the understanding of the complexity, the analysis and the interpreting of data resulting from constant monitoring, management and maintenance, then the coordination of knowledge coming from other technical scientific disciplines that have been in constant dialogue with the Mediterranean Sea system for long.

### **3. A dynamic and layered narrative palimpsest for the Mediterranean Sea**

The body of the terrestrial landscape is a complex matter, very articulated, strongly hybridized and organized according to multiple levels of interpretation and understanding. The involved topics and issues are almost always correlated, the project operations and the spontaneous changes work for levels and plans that are apparently separate but sequential with respect to a hypothetical schedule. Transposing the consolidated interpretations, paradigms and practices from landscape architecture regarding the terrestrial environment onto the Mediterranean marine territories would lead to a strong disorientation generated by the sensation of lack of control on that set of invisible variables that characterize a living mass of such volume.

And yet a first principle to deal with this complexity and make visible the vastness of this argument is perhaps to im-

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3. This professional figure it is suggested to be a new profile capable of coordinating the complexity of the information provided by other specialist figures such as the designer of environmental strategies, the policy expert, the data designer who experiments interpretation devices to understand the environment.

plement a first operation, shared with the terrestrial practices, i.e. considering the Mediterranean seascape as a palimpsest (Corboz, 1985) without any physical and cultural traces but above all without intangible layers that determine the aquatic landscape of the Mare Nostrum. We could obtain an initial breakdown and subsequent visualization of a stratified synthesis of the physical elements of this apparently flat and silent landscape thanks to the systematic use of the concept of palimpsest and through the shift from its static conception that it implies as applied to emerged lands, in favour of a differently dynamic context such as the marine environment, with a system of decoding by layers, using graphic models coded interpretations (Allen, 1999), useful both to the interpretation and to the project of complexity.

The complexity of the Mediterranean Sea is demonstrated by the substantial relevant literature and by the numerous implemented actions, as for example the proceedings of the Convention held in Barcelona in 2017 (UNEP / MAP, 2017), where the categories identified to address the future challenges posed by the sea are of environmental and socio-economic nature and they contemplate the pollution of land and water, the biodiversity of ecosystems, the interactions between sea and land. The reports of the activities are exhaustive and complex but aimed at a highly specialized public.

Another great amount of scientific content produced on the relevant topics can be found in the outcomes of the Vectors project (VECTORS, 2015), funded by the European community and structured in four macro systems and thirty-four

sub-categories: governance, commercial sectors, ecosystem/ecology, drivers/pressure, socio-economics. Analysing the specific contents, many of which are organized according to the parameters of the European reports, they are static, and present a poor communicative and informative value. Without analysing the content which expresses a specific scientific knowledge, we considered it useful highlight how these results would gain a further added value if they were codified and made dynamic, in order to train professionals who the future could be able to coordinate processes of broader strategic vision, such as the imaginary figure of the marine landscape architect previously described.

These two experiences have in common a peculiar question: all the actions of the two aforementioned experiences when they have to show representations of a general and sometimes specific nature, refer to a Norwegian ministerial communication agency Grid-Arendal, which has been associated since 1989 with the UN Environment (Grida, 2019). In fact, in their varied database of experiences, under the heading *State of the Mediterranean Marine and Coastal Environment* you can find a vast and qualified collection of static maps of the Mediterranean Sea through which we understand the will to disseminate information through a breakdown of the problems by themes, yet dating back to 2013.

Although useful, these representations show a closed world that cannot be updated in real time, reducing the Mediterranean basin to a set of static polylines instead of mirroring the idea of a dynamic and constantly moving system.

They are useful to get an idea of the identified topics of analysis but they are scarcely effective in describing the complexity of the elements at stake. When, on the other hand, we are dealing with specific scientific topics regarding themes related to marine dynamics, such as the research *Floating in the Mediterranean Sea* (Suaria & Aliani, 2014), the trend is that of a static cartographic production of moving phenomena that illustrates the sea surface in conjunction with the quantities and qualities of moving waste. The research papers frequently describe a given situation, also through graphs, numerical simulations and cartographic elements that are often understandable to a public of experts in the field. Another problem concerns the access and the setting up of databases that allow the construction of informative and scientific representations designed following the structure of *Ocean Biogeographic Information System* (OBIS, 2019), a significant platform for sharing datasets which anyway does not include a dynamic data visualization.

#### **4. Data proliferation, extended accessibility and multiplication of interpreting tools**

Technology is increasingly enabling the accumulation of great quantities of data, generating an urgent need to give a narrative sense to this apparently raw material, the understanding of which in most cases requires mastery of specialized scientific knowledge. Progressively, if the potential of studies and transdisciplinary readings is recognized as an added value and capable to foster unexpected results, the ability to couple quantitative results of scientific research with a form of communication accessible to a high number of users, becomes a widespread need.

The development of hardware and software technology which allow us to work with the pervasiveness of data is remarkable. Data accessibility is also enhanced by the increasingly rapid and far-reaching dissemination of digital media, together with the improvement of the implicit potential of the technical tools used for data storage, processing and representation.

Despite this advancement, the use of data visualization tools, performed in a wide range of disciplines, including sciences (Nielson, Hagen & Müller 1997), the research fields regarding human-machine interaction (Hogan & Hornecker 2013), art (Viégas & Wattenberg, 2007), geography (Kraak & MacEachren, 2005) the humanities (Segel & Heer, 2010), it remains in the hands of highly specialized figures.

The use of codified graphic languages and the standardization of representations, narrow the possibilities of sharing knowledge with those who do not master the topics dealt with in a specialized manner, thus leading to the flattening of the communicative outcome of technical-scientific research. However, some argue that “data visualization have already become a sort of “lingua franca”, a common global language that crosses the boundaries of culture and politics” (Barlow, 2014, p. 20), Nathan Yau states instead that the data visualization, rather than fulfilling the function of a specialist tool, must function as a medium for conveying meanings (Yau & Lowe, 2013, p. 30), recognizing in fact the role that “alid data visualizations do not constitute the final reduction of analytical processes but they are rather useful platforms to tell stories, to transmit knowledge, to stimulate curiosity” (Yau & Lowe, 2013, p. 30).

This way of understanding the “medial potential” of data visualization is reasserted by the great diffusion of tools which facilitate the process of decoding the relationships intervening in the datasets together with their representation. This is exemplified by software such as RAWGraphs, Flourish, Airtable, MapStory (Bosco et al., 2019), most of which were developed by designer providing software whose more natural interface facilitates searching of meaning in this mass of information. This fact is a further confirmation of the renewed design attitude of designers within these issues that is not limited to the application of data visualization methodologies aimed solely to communication purpose.

A further non-negligible factor encouraging an in-depth reasoning regarding the formats available to process and make accessible this information is the impact of the increasingly huge amount of data to which contemporary society is exposed.

Starting from the topics covered in this work, the opening of the project to a non-specialized and large audience to make the complexity of the phenomena visible, accessible and usable through representation, we aim at giving evidence of how the visual representation, the static and dynamic physics of data with the adoption of approaches that overcome the codes imposed by data visualization can foster the interaction and improve the qualities of their communication skills.

## **5. Data as raw material: visibility, accessibility and usability**

Starting from the point of view that the control of the current abundance of data and of the resulting flow of information can be limited by disciplinary boundaries, in the variety of

interdisciplinary contributions that the experts can provide, design can play a key role. On the one hand, design can be useful in solving the formalization and visual expression of masses and data flows; on the other it is able to operate in order to detect new orientations and scenarios for the use of data, researching ways to translate their variable trends and resorting to a plurality of communication solutions on a macro and micro scale.

“Going beyond the traditional models of visual representation of data, which give priority to the presentation of data”, the design intervenes to give coherence and structure to the discourse that springs from the alphanumeric sequences – not easy or immediate to understand –; “Design provides real spaces of re-presentation” (Bihanic, 2018, p. 4), facilitating an interpretation which is more sensitive to the dynamics of relationship among them, as well as providing useful devices to detect significant forms. This way of understanding data design materializes by giving visual or physical form, static or dynamic behaviour to aggregations, congestions, fluctuations and circulation of data, which are considered as immanent, ductile, malleable presences and endowed with an incomparable plasticity: in this way the data can be considered raw material. Data design in this sense is aimed at identifying and facilitating ways of interaction between data.

Data visualization is traditionally considered a tool for data exploration aimed to the formulation of hypotheses. Due to the fact that historically its roots lie within scientific disciplines, data visualization represents the result of an analytical

process. Considering data as a raw material implies to know its properties and specific uses. The specificities at the basis of the data design can in fact be knowingly employed to support the production of different forms of value. The initial use of the data implies their interpretative, critical and expository use, aimed at promoting the production of new knowledge (epistemic value). Another possibility concerns the design of artefacts that respond to more descriptive, explanatory logics of datasets, which want to facilitate the development of new methods, techniques and processes of analysis (praxis value). The third use is exploratory and heuristic, aimed at supporting the production of poietic value (Bihanic, 2018, p. 10).

Artists and designers are expanding the significant scope of data visualization (Viégas & Wattenberg, 2007), getting to the formulation of targeted design interventions. There has been talk of “data narrative” (Lupi, 2015) when, through a humanistic approach, the intent to “give human life to data” combines the traditional codes of data visualization with cognitive studies on perception, with the result of new visual syntax. A second significant drift is identified by the “data physicalization” (Hogan et al., 2016) where the data become tangible, which can be experienced through physical and material forms, conveying information through unusual physical paradigms. A third practice is “data sensification” (Hogan, 2018); in this case the data acquire real environmental dimensions in which the emphasis is placed on the interaction modes with the data represented by the users.

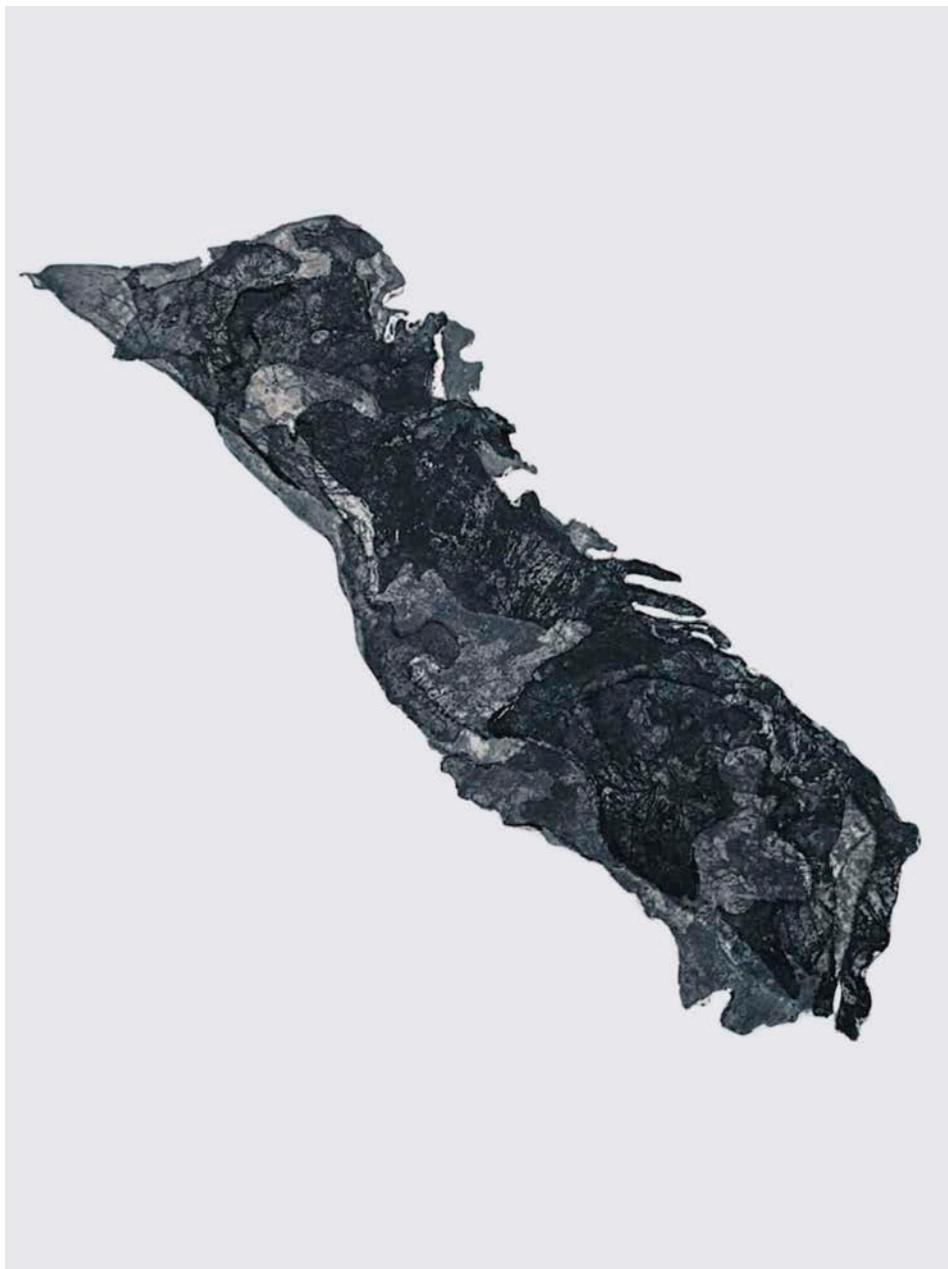
## 6. How data design could serve the “physical story” of the seascape layers

As considered in the first paragraph, considering that the landscape architects have to deal with the interpretation of marine dynamics, they will need new cognitive tools. Some theoretical reflections (Giroto & Imhof, 2016), ongoing research (Picon, 2017) and carried out experiments (Donika, 2015) show how it is possible to combine interpreting levels of a landscape, data and physical elements in real time, in order to make visible the invisible, even in maritime contexts. The broad scope of scientific knowledge produced in the Mediterranean Sea is negatively affected in some cases by poor readability and organizational coherence of materials; in order to work on the sea, it will be necessary to rely on content produced by other scientific disciplines that are expressed through specialized languages.

Some examples are presented below which give evidence of how design and analytical sensitivity can merge starting from scientific assessments (Kirk, 2018). In these cases, “the stratification of the different discursive levels arises from different writing practices: the writing which are typical of design and other improper writings innervate the artefact designed as a sheet music where, with specific languages and specific modes of representation, they move together” (Baule, 2013, p. 35). In the event that strictly artistic practices are involved in this process, the risk is that the result will be in favour of an imbalance towards aesthetic-conceptual drifts to the detriment of the loss of the content associated with data: unlike the design disciplines, the artistic practice does not always consider in fact the purpose of usability.

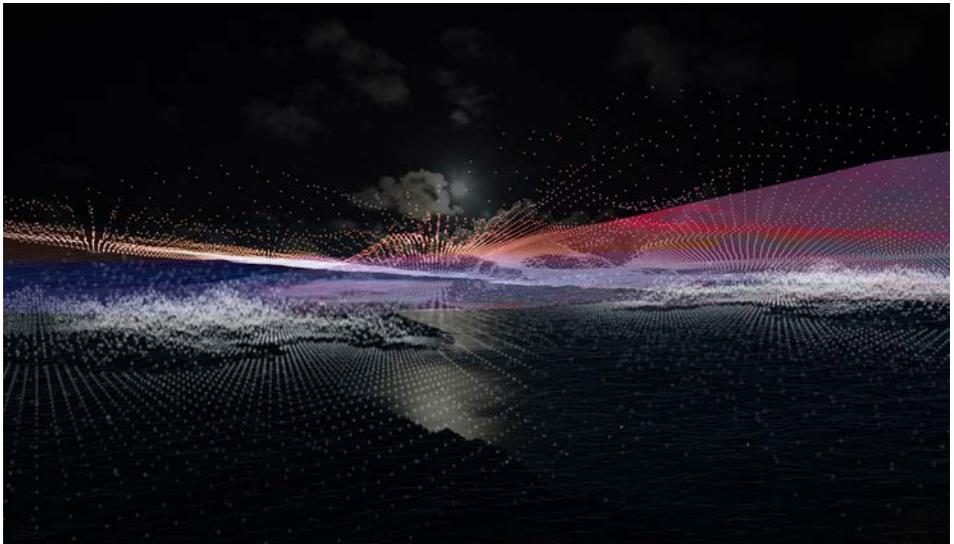
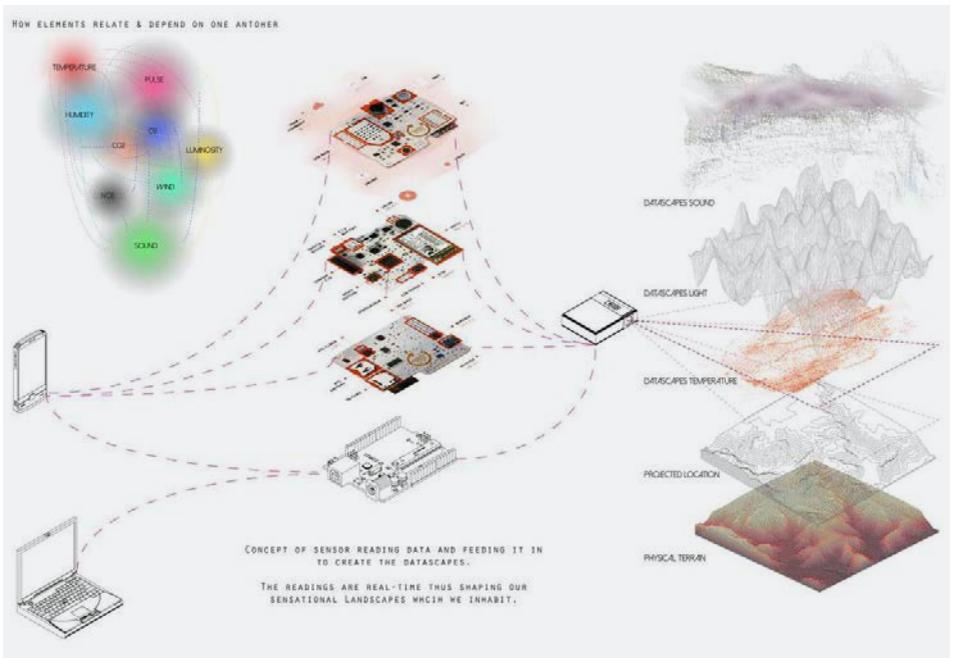


**Figure 1.** *Tracce di Marea*, Federico Polloni, 2019, from the research of Georg Umgiesser et al. entitled *Verso l'omogeneizzazione delle lagune Mediterranee e perdita della loro biodiversità.*



The collaboration between the Institute of Marine Sciences of the National Research Council (CNR – ISMAR) and the Academy of Fine Arts of Venice, led to the results that converge in the exhibition *The Art of Marine Sciences. The oceans portrayed by artists and researchers* curated by Francesco Marcello Falcieri Gabriella Traviglia (2019). Figures 1-2 give an account of a way of interpreting the data that supports the production of poetic value in the way they research meaning in the traces of the lagoon biodiversity left on a strip of cotton left soaked in water.

More closely related to the objectives contemplated by the topics discussed here is the result of the research work *Sensational Landscapes of Data scenarios Experience through invisible Architectures* (Donika, 2015) (Fig. 3-4). The research carried out by Donika Llakmani focuses on the relationship between landscape and sense perception, on the immaterial world that surrounds the physical and real world and how it is possible to implement a transfer of knowledge and experiences capable of restoring the architecture of natural elements such as temperature, humidity, light, sound, carbon monoxide, nitrogen dioxide. This planning materializes through real-time landscape recordings that seek a dialogue between the body, the atmosphere and technology. The ambitious goal of this work is to attempt to generate “an architectural experience of atmospheric consciousness”, where the bodies do not represent static but adaptive components with respect to the surrounding environment. Donika states that this approach can lead to the development of a greater awareness of the surrounding environment, facilitating the understanding of the invisible architectures that exist in the *empty* space.



**Figures 3-4.** *Sensational Landscapes of Data*scenarios. *Experience through invisible Architectures*, Donika Llakmani, 2015. Retrieved from <http://futurearchitectureplatform.org/projects/12cd64ad-d0b0-469e-b2f2-8cba107996a3/>.

In order to pursue this vision, architects play an active role in understanding and activating new dialogues, generating data languages that breathe through the senses.

David Bowen's approach in *Underwater* (David Bowen, 2012) (Fig. 5-6), a large-scale kinetic installation, suspended, that takes shape and comes to life nourishing itself with data deriving from the movements of the water surface in Lake Superior (North America), supports a design direction attributable to what Bihanic calls "praxis value". In fact the simulation of water motion is generated in real time by the operation of 486 servomotors, as well as providing remote physical evidence, it facilitates the search for new methods, techniques and processes of analysis of the data produced. Also, by Bowen, *Tele-Present Water* (2019) consists of the plastic evocation of a remote dynamic topography. Even in this case it replays the movement of a part of the Pacific Ocean thanks to the real-time transmission of the recordings made by the sensors placed on a buoy by the National Oceanic and Atmospheric Administration (NOAA).



Figure 5. *Underwater*, David Bowen, 2012. Retrieved from <https://www.dwbowen.com/>.

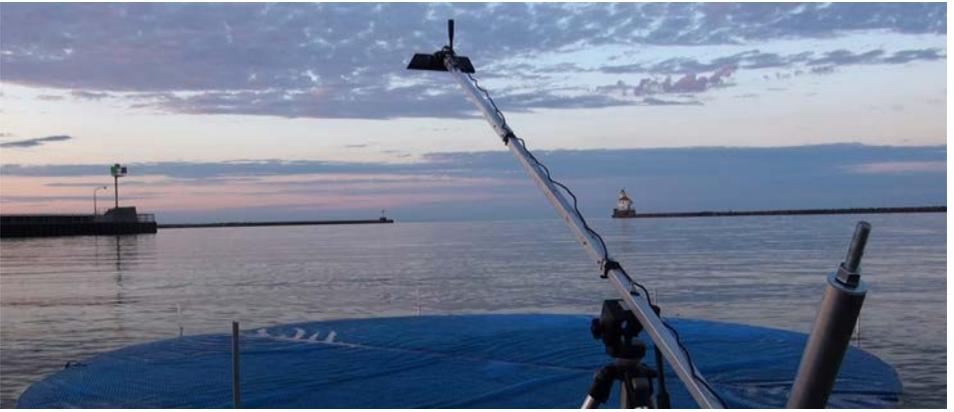


Figure 6. *Underwater*, David Bowen, 2012. Retrieved from <https://www.dwbowen.com/>.

## 7. Conclusions

If we imagine a near future, where the complexity of atmospheric agents at play, of tides, temperatures, emissions, currents, merchant routes, fish populations, water temperatures, plastic islands, exotic contamination of the Mediterranean flora and fauna, of migratory flows, of wrecks deposited on the seabed over centuries of civilization, of thermal trails emitted by radioactive waste, were data designed and organized per layers in dynamic cartographies updated in real time, to constitute a heterotopy of information capable of revealing a new landscape both at two-dimensional and three-dimensional level and simultaneously visualized on a single digital, open-access platform. Thanks to this device the intangible would obtain a more tangible rendering, thus giving the possibility to reveal not only a simple, wavy surface but a liquid organism with which we are constantly called to interact.

Although the topics addressed here relate to an initial phase, the issues that have emerged are the first useful elements for

the launch of a research strand that addresses the different ways in which a tool for knowledge, monitoring and research, for the first time the scientific structure of a European Agency for the Mediterranean could be built on technology and shared knowledge. A project also at political level that interprets the “tabula liquida” not only as a set of geographical boundaries to defend, but as a transpiring and constantly changing organism whose care is above all the responsibility of the populations that inhabit it.

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Member of Coloco, an independent collective born in 1999. Since 2006 it formally constitutes a landscape firm that brings together landscape architects, urban planners, botanists, gardeners, artists who collaborate with a vast network of experts, from botanical activism to ecological engineering. Over time, the experience has led to discussions with professionals, local authorities, associations or singular personalities with the aim of creating and supporting integrated projects, bringing together public services, associations, activists and volunteers to explore new relationships in reflection and collective construction. Coloco also plays an important role in broadcasting and teaching in the form of seminars,

or both academic and informal public conferences. Exploration, strategy, activation, construction, transmission are the phases of Coloco's projects in order to support the relationship between people and the places where they live, all unique and all together. Situations and requests vary indefinitely, but commitment is the same: creating places whose quality is measured by their ability to accommodate the enormous diversity of life.

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### **Tommaso Listo**

Master degree in Philosophical Sciences at the University of Milan. Specialized in Digital Humanities at Ca' Foscari University of Venice. Research fellow in Design at Iuav University of Venice. From 2019/2020 PhD in Architecture, History and Project at Polytechnic of Turin.

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Scuola del Terzo Luogo was born and developed during several editions of Incontri del Terzo Luogo, moments of research on the "undecided" spaces of the city, spaces in which not everything is totally chaotic and wild, but where not everything is already planned. Starting in the fall of 2012, an informal group of people started a journey within these spaces that has facilitated comparison, actions on public space, experimentation, relations with the context and various forms of life with special regard to the topic of the garden. The reference place that gave life to this path, supporting it with its own resources, is Manifatture Knos, an undecided space in the city of Lecce, that has been recovered after a long period of abandonment and returned to the city as an independent cultural center. Scuola del Terzo Luogo wants to deal with new forms of pedagogy by challenging conventional teaching models, where giving political dignity to indecision becomes the modality of intervention on the common good, or the practice through which we take care of places.

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She is currently working on the correspondence and on the publication of the sculptor Vico Consorti (1902-1979) at the University of Siena, following the assignment for the research project *Siena anni Trenta: ipotesi per una mostra* (2017). In 2016 she joined the national project *Diffondere la cultura visiva: l'arte contemporanea tra riviste, archivi e illustrazioni* (Progetto Nazionale FIRB 2012). In March 2016 she received her PhD at the University of Florence with a thesis titled *Le immagini al potere, le immagini del potere. La rappresentazione fotografica dell'architettura contemporanea nelle riviste italiane di settore (1928-1943)*. Graduated in Contemporary Art History at the University of Siena in 2011 with the thesis *Adrian Paci. Da Albanian Stories (1997) a The Encounter (2011)*, she is also specialized in video art. She is interested in the architecture of the Sixties in Italy and Europe, a theme that she has treated in her research *L'architettura pneumatica. Ricerche negli anni Sessanta tra avanguardia e utopia* (2007). Her recent research interests include new media in relation to visual arts, with special reference to architectural communication in Italian, French and German magazines in the Twenties and Thirties and in relation to power and totalitarianism.

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Member of Ground Action, a collective of experts in the field of architecture, landscape and art, which is inspired by all those collective, active and participatory practices of space making such as, for example, the international experiences of the operational workshops. Its activity is configured as an on-site and open air research atelier, aimed at triggering or accelerating the re-evaluation processes for peculiar places, claiming the performative value of the action in the public space and in the landscape. It promotes sustainable design by using recycled materials and the direct and concrete realization of the installations using impromptu ways and forms. According to its method, Ground Action helps to create the opportunity for a dialogue with administrations, other local institutions and all those subjects active in the area capable of providing specific support and knowledge.

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