## MSP Challenge Simulation Platform

Design & Style Guide

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## Introduction

#### What is Marine & Maritime Spatial Planning (MSP)?

"Marine Spatial Planning (MSP) is a public process of analyzing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic and social objectives that have been specified through a political process." UNESCO, [date]. https://ioc.unesco.org/our-work/marine-spatial-planning. Accessed 9 February 2023.

#### What is the MSP Challenge?

Human activities at sea such as offshore wind farming, shipping and fishing, easily get into each others way. And they have a long-term impact on the marine environment. Marine & Maritime Spatial Planning (MSP) Challenge has been designed to help decision-makers, stakeholders and students understand and manage the maritime (blue) economy and marine environment.

In the interactive simulation, country planners and stakeholders see the entire sea region and review many different data layers to assess the current status. They develop plans for future uses of sea space, over a period of several decades. The consequences of decisions for energy, shipping and the marine environment are simulated and visualized in indicators and heat maps.

MSP Challenge integrates best available geo, maritime and marine data with simulation models for ecology, shipping and energy production. Using advanced game technology and game thinking, MSP Challenge is designed to engage and immerse users, making it a perfect environment for stakeholder engagement, planning through co-design, learning and education.

#### The MSP Challenge Simulation Platform in a Nutshell.

In the simulation platform, multiple users have an overview of an entire sea region, such as the North Sea, the Baltic Sea or the Clyde Marine region.

Users can review many different data layers provided by many authorities in Europe, to make an assessment of the current status and develop plans for future uses of sea space, over a period of several decades.

Future plans for energy, shipping, fishing and the marine environment are simulated. The effects are presented in indicators and heat maps, such as for biomass, energy production, shipping route and port efficiency. The platform supports transboundary cooperation and consultation between different countries and stakeholders in a sea basin.

Moderators can set up interactive sessions with multiple users representing different countries or sectoral interests. They can define session duration and start/pause/speed up and slow down time to run the simulation. Developers can modify or add data layers. The platform can also (be made to) communicate with existing models and simulations.

#### **Our Vision.**

We see a need to innovate the way we talk, discuss, learn, make plans and take decisions about our seas and oceans. We must look at the sea from a broader and longer-term perspective. Learning to go beyond self- and short-term interests. We think that planning and decision-making about the maritime economy and marine ecosystems can become more intelligent, interactive and immersive.

By making use of emerging digital technologies, such as games and virtual reality, we can connect geo, maritime and marine data, with eco modelling and maritime simulations. The MSP Challenge is a community-based, open source and non-profit initiative, since 2011. Thousands of people around the world have experienced the MSP Challenge simulation platform and board games.

#### **Target Audience**

- 1. Marine / maritime spatial planners (professionals), i.e., those who do MSP as part of their job or are at least responsible for it. Typically, they work for a national government agency or ministerial department and work within or as a team. The leaders of such a team might not do MSP themselves but rather develop and guard policies and decisions about MSP, i.e., how it should be conducted and what the strategic governmental interests are in it.
- 2. MSP sector stakeholders (professionals), i.e., those who have an interest at sea and thus within the MSP process. Think of sectors such as (renewable) energy, shipping, commercial fishing, aquaculture, telecommunications, marine / environmental protection. Typically (sub-)sector representatives are more involved in the MSP process than individual companies, and they are consulted during different stages of the process. They could also be more regionally or locally oriented.
- **3. MSP researchers (professionals)**, i.e., those who study MSP processes and outcomes, nationally and internationally, typically from a multidisciplinary or interdisciplinary perspective. The research could be fundamental and / or applied in nature, e.g., focusing on understanding what it is in different (cultural, political, geographical, ...) contexts, or on developing data, tools or interventions to somehow improve it.
- 4. Students in higher education, i.e., those who need to learn about MSP as part of their coursework at a university (of applied sciences). They typically take a module or follow a longer program revolving around MSP or broader subjects such as marine planning, environmental sciences or even policy sciences. Typically, the primary learning objectives concerns understanding the intricacies and overall complexity of MSP.

#### Use Cases

- a. MSP stakeholder engagement workshop
  - Primary target audience: MSP sector stakeholders.
  - Good to also involve MSP planners and MSP researchers.
  - Tend to last from half a day up to a full day.
  - Focusing on for instance, multisector planning, transboundary planning, synergies and conflicts between sectors, etc.
  - Could use any MSP Challenge edition.

#### b. Scenario exploration workshop

- Primary target audience: any MSP professional.
- Good to also involve other types of MSP professionals.
- Tend to last at least one day, could be a whole week.
- Could involve developing various scenarios for a specific sea basin, ideally involving multiple sectors and plans, developed in parallel or sequentially.
- Would require a specific MSP Challenge edition of choice, e.g., the North Sea.

#### c. Basic or advanced teaching workshop

- Primary target audience: students.
- Good to also involve some MSP planners, stakeholders or researchers, providing guest lectures and / or feedback.
- Tend to last at least one day, could be a whole week.
- Ideally, involves multiples iterations of planning and simulation.
- Could use any MSP Challenge edition.
- **d.** Individual use or group use (a)synchronously: MSP Challenge can also be considered as an MSP support tool, and thus be used outside of a workshop context.



## Cabin

Used as primary font for all text elements in-game and for default text on the MSP Challenge online platforms and promotional media.

Aa Bb Cc Dd Ee Ff Gg Hh Ii Jj Kk Ll Mm Nn Oo Pp Qq Rr Ss Tt Uu Vv Ww Xx Yy Zz

1234567890



Used as secondary font on the MSP Challenge online platforms and promotional media.

Aa Bb Cc Dd Ee Ff Gg Hh Ii Jj Kk Ll Mm Nn Oo Pp Qq Rr Ss Tt Uu Vv Ww Xx Yy Zz

1234567890



## **Colour Palette**

### **Main Colour Palette**

The goal of the new colour palette is to make the user interface more breathable and modern. This is achieved by stepping away from the use of greys, often seen in older software, and instead transitioning to semi-transparent black windows. The transparency allows the focus to remain on the interactive map and the visualisation of the data, which is the most important part of MSP Challenge.

Light window headers create a nice contrast from the bodies and avoid making the overall game too grim. This also makes the title of the window stand out from the rest of the content.

A blue-green is used as the primary accent colour and serves as a thematic reminder for the sea. It adds a splash of colour to the game while being different enough from the various team colours to not be confused as one. The secondary accent colour is an earthy orange and represents the rocky shoreline. It is complementary yet contrasting to the primary accent colour. It is used to make specific content stand out.





30% Transparancy

## **In-Game Application**

#### **Objects**

Primary 01: Off-White | #F5F5F5 | (L\_White\_CA)
Primary 02: Full-Black | #000000 | 30% Transparency | (L\_WindowContentBG\_CA)
Accent 01: Orange | #F7A02B | (L\_Accent3\_CA)
Accent 02: Blue-Green | #037C7C | (L\_Blue4\_CA)
Text Elements
Primary 01 (Dark background): Full-White | #FFFFFF
Primary 02 (Light background): Dark Blue-Green | #055D63
Accent: Orange | #F7A02B
(Show on different kind of background)



## **Team / Country Colours**

When implementing colours to convey important information and not only for aesthetic appearances. It is important to consider user's varying perception of colour, particularly those with colour blindness.

We often fail to consider minorities or people that are in other ways far removed from ourselves. It is important to design with our possible differences in mind.

Some users may not be able to properly perceive all aspects of a design with poor colour contrast levels. Good colour contrast is a critical aspect of the Web Content Accessibility Guidelines (WCAG) and an accessible UI should employ 'soft-proofing' techniques to colour schemes.

There are three main types of colour blindness: Monochromatism, dichromatism, and anomalous trichromatism. These can be further sub-divided into tritanopia, deuteranopia, and protanopia to determine which colors and hues are not visible based on the cones present in the retina. The most common type of color blindness makes it hard to tell the difference between red and green.

In order to obtain a total of eight different team colours, it wasn't possible to leave out reds and green completely, but we avoided using too many variating hues for these colours. We also made sure to pick colours with varying undertones and contrasts. The colour palette was tested through a <u>colour blindness simulators</u>.





## **User Interface Guide**

### **User Interface Design 101**

What is important to consider for good UI design? Multiple of the following design principles are part of Jakob Nielsen's '10 Usability Heuristics'.

**Status visibility & informative feedback.** Ideally, users should always be informed of what the system is doing through appropriate feedback within reasonable time. Provide feedback for all user (inter)actions (Example: password strength). Immediate feedback will acknowledge that the application has received an input, reduce the level of uncertainty, reinforce the sense of manipulation, and prevent a user from potentially making mistakes (Example: clicking the same button twice). Actions should be organized into groups with a beginning, middle and end. Informative feedback at the completion of a group of actions gives users the satisfaction of accomplishment and a sense of closure (Example: A confirmation page after completing an order).

**Error prevention & tolerance of mistakes.** Prevent errors from occurring as much as possible. (Example: by implementing smart defaults, confirmation requirements, greyed out unavailable items, preventing typing alphabets in number fields etc.). Provide feedback and a way out when an error does occur. Communicate the cause and how it can be rectified in comprehensive language (Example: by implementing methods of cancelling, such as an undo and redo function). In the context of the systems selected for ILIAD, error prevention must also take into account the use and the potential for errors in numerous third-party systems.

**Help & documentation.** Even though it is better if a product can be used without documentation, it is still necessary to provide help in case of need. Such documentation doesn't need to be visible at all time but should be easy to retrieve. The informational contents should be easy to search, focused on the user's task, list concrete steps and not be too large to avoid information overload.

**Clarity / real world and product connection.** A product's interface should align to concepts, terminology and language already familiar to the user. Do not reinvent the wheel. Instead, reuse conventions and patterns that have proven effective in the past and exist across other platforms. Familiarity cultivates comfort and trust. It gives the users a sense of control, thus enhancing the user experience of a product.

**Reduce cognitive load.** To maximize usability, reduce the load on memory by relying on recognition instead of recall. The number of cues that can help memory retrieval are much fewer for recall than recognition, making recall more mentally intensive and error-prone. The user should not have to remember information located elsewhere in the application in order to understand and properly interact with the elements on the current screen. As mentioned before under 'help and documentation', instructions for use of the system should be easily retrievable whenever necessary.

**Consistency.** All repeated content within an application should be uniform: it should have the same visuals and functionality. Consistency limits the number of ways content is represented, allowing users to get familiar with the interface more easily and faster. This applies to everything from patterns to terminology. It ensures that users do not require to learn new representations for each task / action. Consistency creates a sense of control, familiarity and reliability, thus reducing the cognitive load and improving the clarity of the product.

## **User Interface Design 101**

**Minimalist design.** Good UI design is practical, not decorative. Less is more. Overly decorative designs create unnecessary distraction from the elements that are truly relevant to the user. Do avoid overwhelming the users, define a main focus point for each screen, clearly convey its purpose and the required (inter)actions to maximize visibility and clarity. Avoid unnecessary complexity by cutting down on the amount of irrelevant or rarely needed information.

**Ease of use.** An interface should remain simple and easy to use for the average person. Generally, users should not need training in order to use a product. Accommodate both novice and advanced users, while still tailoring the experience.

Accessibility. It is important not to assume that users are like you, or the people in your direct environment. This goes for technical knowledge and abilities, but also opinions and general point of view. We often fail to consider minorities or people that are in other ways far removed from ourselves. It is important to design with our possible differences in mind, such as motor, cognitive or visual impairments.

## **General Windows Properties**

Window Body	
External margin (Spacing between other elements and the window edge):	16рх
Horizontal margin (Spacing from the window edge to the window content):	16рх
Vertical margin (Spacing between stacked content within the window):	12px (Lists varies, generally around 6px)
Default colour:	#000000   Opacity 55% (L_WindowContentBG_CA)   Gaussian Blur Radius 40px
Default font settings:	#ffffff   13px   Cabin Regular   Kerning 4   Left Aligned
Corner rounding:	12px

Window Header	
Default vertical size:	32рх
Default colour:	#f5f5f5 (Off White)   Opacity 100% (L_White_CA)
Default header font settings:	#055d63 (L_Blue5_CA)   15px   Cabin Bold   Kerning 4   Centered

## **General Windows Properties**

Window Divider	
Default vertical size:	26рх
Default colour:	#037c7c   Opacity 100% (L_Blue4_CA)
Default font settings:	#ffffff   13px   Cabin Regular   Kerning 4   Centered

Window Objects (such as drop-down bars or typing bars)	
Horizontal margin (spacing from the object edge to the object content, generally text):	12px
Default vertical size:	24px
Corner rounding:	12px

Icons	
Default size:	16рх

## **General Buttons Properties**

Button States	
Active:	Default properties (Generally: Button #037c7c   Font #ffffff Or: Button #f5f5f5 (Off-White) (L_White_CA)   Font #055d63 (L_Blue5_CA)
Inactive:	Opacity 30%
Selected:	Button #f7a02b   Font #ffffff

Button Interactions	
Select:	Button #f7a02b   Font #ffffff
Hover:	Button lighter version of original colour (Still needs considering)

Button Feedback	
Visual:	Active, inactive, selected
Animation:	Hover, select
Audio:	Select
Tooltips	Hover

## **General Buttons Properties**

Button Feedback	
Visual:	Active, inactive, selected
Animation:	Hover, select
Audio:	Select
Tooltips:	Hover

### **Best Sprite Approach**

- Export only what you need. Cut excess empty space and use sliced sprites whenever possible. This saves on image size.
- Use white images and re-colour them in the UI component in Unity.
- Always use power of two dimensions if possible.
- The UI supports scaling up to two times the original size. For this reason, it's important to export sprites at double the resolution.
- Use a consistent image format, preferably with lossless compression such as PNG.
- Follow the pre-established naming convention. Coming soon.
- In the sprite importer in Unity, set the packing tag for all the UI sprites to the same number. This will pack the sprites into an atlas which will improve performance.
- Dimensions of UI elements are often even numbers to ensure that the font renders on absolute pixels. Odd numbers sometimes work but can cause text that is centered aligned to be placed on half of a pixel.



# User Flow / Journey

### **Meta Flow - User**



## **Main Gameplay Steps**

#### 1. Explore Data

- Explore and familiarize yourself with the data through the list in the 'Data Layers' window.
- Toggle data layers on to visualize on the map.
- Consult impact tool to see what elements influence each other and how.

#### 2. Discuss Ideas & Define Goals

- Discuss your ideas with your team.
- Define development directions and goals (even if not final).

#### 3. Create Plans

- Create a new plan.
- Fill in general information, such as the name, description (optional) and implementation date.
- Select data layers that you want to alter with this plan.
- Implement policies (optional).
- Draw new geometry or edit existing geometry within specific data layers.

## **Main Gameplay Steps**

#### 4. Consultation (If applicable)

- If geometry overlaps with another team's country, consult your plans with them and ask for their approval.
- Did the other team(s) approve of the plan?
- Yes  $\rightarrow$  Move the plan to the 'Approval' state and wait for it to be implemented.
- No → Find out why the other team doesn't want to cooperate and edit the plan or scrap it all together and go back to step 2 and / or 3.

#### 5. Go back to step 2 and / or 3 (Optional)

#### 6. Simulation

#### 7. Reflection

- Asses the impact of your (and other teams their) plans through the 'KPI' windows and the 'Objectives Monitor'.
- Reflect on what (probably) went wrong and what went right.
- Consider what you should have done differently.
- Try again.

## **General Gameplay Flow**

Coming soon: flowchart



### See also the MSP Challenge Community Wiki: How to design a session

### **Spatial Plan Creation Flow**



## **Meta Flow - Game Manager / Host**

#### Coming soon: flowchart

- 1. Go to the MSP Challenge <u>server manager</u> and log in. New users will have to create an account.
- 2. Select the 'New Session' button.
  - Selecting configuration file: Fill in session name, config file (sea basin), config version (auto), GeoServer (auto), simulation server (auto) admin password and player password. Select 'Create Session' button.
  - Loading a saved session: Fill in session name, simulation server (auto) and select the session save you wish to load. Select 'Create Session' button.



## **Redesign & New Features**

## **Login Screen**

The purpose of the login screen is to provide the user with a clear and welcoming introduction to MSP Challenge.

Previously, the login screen closely resembled 'launchers' used in many traditional video game titles. <u>See page 38 and 39</u>.

It has been our goal for a while to turn the login screen into a hub-location, not only containing the session browser but also general information about MSP Challenge, software update announcements, news etc.

When redesigning the login screen, we stepped away from the 'game launcher' layout, as it didn't properly represent our vision for MSP Challenge.

MSP Challenge classifies as a serious game and while we strive to incorporate storytelling, challenges and immersive roleplaying elements into the experience just as traditional video games do, its purpose isn't solely entertainment. We believe that MSP Challenge is a strong planning software. With its access to real-life data, <u>Ecopath</u> with Ecosim models, simulations and an extensive set of tools for marine and maritime spatial planning, MSP Challenge can assist in research & development projects, stakeholder engagement and education, to name a few possibilities.

We decided to go for a more conventional design that our target audience is more likely to be familiar with. <u>See pages 40 and 41.</u>

All the information that was previously featured together in the launcher has now been divided over a set of screens that the user can easily access through the fixed left-side menu.

Dividing the information over a few screens with each a clear category and more bitesize sections makes it easier and therefor faster for users to find what they are looking for. Having less information showing at the same time also allows for more breathing space, which enhances the overall clarity.

The goal behind the landing screen is to create a 'wow-factor', through its vibrant imagery and a playful animating banner that represents the abstract map and planning side of MSP Challenge. This is the first content that users see when starting up the MSP Challenge software, it is important to create a good first impression. In contrast to the other screens, the landing screen focusses mainly on being visually appealing rather than conveying a lot of information, with the exception of the 'news' section.

The news section features a few of the most recent news publications to reduce the chances of important announcement to be missed. The main goal for users when opening the MSP Challenge software is to join a session, and it isn't unlikely for them to skip over any other content.

The login screen also has a 'intro' screen, which mainly targets new users that might not have had a general introduction to the MSP Challenge software yet, because they discovered the software on their own online instead of through one of our hosted sessions. It introduces the user to our vision, possible use cases and a set of more indepth informative videos.

SERVER LOGIN			
MSP Challenge			
SESSION LIST	DEMO		
REFRESH		SESSION INFO	
North Sea demo		🕘 Play	
Adriatic Sea demo		🥑 Pause	
Baltic Sea demo		婱 Pause	
Clyde marine region demo		🥑 Pause	
North Sea Digitwin demo		🥑 Pause	
Fetching sessions from server.mspchallenge.info		RESET ADDRESS	
QUIT		CONNECT	





MOD	Chall	
IVISP	Clial	lenge

Team	Orange	×
Name	Ihuissier	

BACK

CONNECT

Before





Latest News: Beta 9 released | Beta 10 released | Two new publications

After

**Read More Development Build** 



Home Intro Sessions News Quit

## Sessions

Server Address server.mspchallenge.in	nfo 🖍 方
Session List	
North Sea demo	Pause
Adriatic Sea demo	Pause
Baltic Sea demo	Pause
Clyde marine region demo	Pause
North Sea Digitwin demo	Pause



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# **Loading Screen**

The purpose of the loading screen is to provide the users with an estimated waiting time while the game loads.

Previously, the loading screen showed a loading bar with a percentage on a static background image. <u>See page 43.</u>

When redesigning the loading screen, the background image was updated to be the same as that of the Login Screen. The loading bar got replaced by an abstract rendition of the background imagery, which slowly expands from a thin line in the middle of the screen to the sides, until it reaches full screen. This ties in the visuals and animated banner from the Login Screen with the loading screen. In the bottom left corner of the screen, a percentage indicates the progress and what specific in-game element is being loaded at that moment in time. See page 44.



Loading: 67%



# LOADING....51%

Now loading: layers



After

## **Tutorial**

Though we strive to make the user experience of MSP Challenge as clear and streamlined as possible, it will always remain a complex piece of software with extensive in-game possibilities. The purpose of the tutorial is to provide new users with a general introduction in order to smoothen the initial learning curve. Once completed, the users should have a general sense of what the game is about (i.e., the notion of multi-player marine spatial planning), and of the steps they can take in order to progress in the game.

When starting up MSP Challenge for the first time, new users will be prompted with the option to follow the tutorial, which they can either accept or decline.

The tutorial consists of informative pop-up overlays integrated in the actual game software, instead of being a complete separate and simplified interface. It guides the users through the core features required to get started step by step, while simultaneously introducing them to the complete software. The tutorial is an opportunity for- and encourages more adventurous users to already start exploring the rest of the interface and learn through trial and error.

Eventually, the majority of the features will need to be to be applied during an MSP Challenge session, so the sooner users get the chance to explore them the better.

The tutorial will occasionally require the users to fulfill simple tasks before they can proceed, such as consulting a specific window or creating a simple spatial plan. This avoids users from accidentally or purposefully skipping past important information.

The tutorial is divided into four sections. As the name indicates, 'Part 1 Interface Basics' introduces the users to the very basics, such as how to maneuver through the interactive map and where to access important windows such as the Main Menu and the Help Windows.

'Part 2 Accessing data & exploring the consequences' introduces the users to the data layers catalogue, the legend and the impact tool. This gives the users a first impression of what is already going on in the sea basin.

This then seamlessly leads to 'Part 3 Creating & implementing plans', which shows users how to turn their ideas into actual spatial plans, how to draw new- or edit existing geometry, and how to get a plan approved and ready for implementation.

Unlike all previous sections, section four focusses on end-game reflection instead of essential early-game information and functions. 'Part 4 Evaluating consequences' shows the users how they can assess the impact and consequences of their plans through the KPI- and Objectives Monitor windows once the simulation has run. This is why once the users wrap up section three, they are offered a shortcut to start the game and skip section four if they wish.

Once completed, the user will never be prompted to follow the tutorial again, but it can be manually reactivated through the 'Tutorial button' under the 'Main Menu window' (Cogwheel button, top-right corner).

The expectation is that by introducing a tutorial, users will be able to interact with the software with more confidence from the very start and that there will be fewer general questions throughout a session. This also makes it easier for external parties to host their own MSP Challenge sessions, without requiring the presence of an MSP Challenge member.

# WELCOME

If this is your first time playing MSP Challenge do you want to follow the tutorial?

No

Yes

# PART 1 INTERFACE BASICS

Before we start creating, implementing and evaluating spatial plans, let's walk through some basics.



#### ACCESSING DATA & EXPLORING CONSEQUENCES [2/7]

Select a category and pick which data layers to visualize on the map.



### **CREATING & IMPLEMENTING PLANS [9/21]**

To draw new areas, you first need to toggle on a data layer sub type from the list and click the create button.

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# **Help Windows**

MSP Challenge has various tutorial videos and other helpful information available on the community wiki- and knowledge base websites, which is useful but not very accessible during a session. The purpose of introducing the Help function is to provide the users with guidance on how to interact with a window's features. It gives them the possibility to troubleshoot their actions within the game software by making information easy to find and pinpointed to what they are doing in that very moment.

Each in-game window has a help function that can be accessed through the question mark button in the top left corner of the window header. Selecting it will trigger a popup to open, providing information for all the features available in said window, through infographic-like visuals.

This also makes it easier for external parties to host their own MSP Challenge sessions, without requiring the presence of a member of Cradle.

# DATA LAYERS

Select a category of which you want to view the data.

When double clicking a category all the sub-categories will automatically get toggled on.



VIEW FULL MANUAL

Mockup

## **Data Layers Window**

The Data Layers window serves as a catalogue that users can consult to explore the various data available for the selected sea edition.

The data layers are divided in three overarching categories; Management, Activities and Ecology. Within each of these categories, the data layers are divided again into sub-categories, the names and quantity of which vary per sea edition.

Previously, these sub-categories were displayed as individual icons. The issue with this approach is that, though we always try to design thematically representative icons, they aren't always very clear. This often left users guessing what sub-category they were about to select, as the name of the sub-category only got displayed in the Layer Select window, which opens to the side of the Data Layers upon selection. This led to a lot of inefficient browsing as well as being handicapping for users who use text-to-speech plugins due to visual impairments. See page 53.

In the new version of MSP Challenge, the icons are accompanied by the name of the sub-categories written out in text. A search bar at the bottom of the Data Layers window now enables the users to easily search for a specific term, instead of having to first guess what sub-category the term possibly belongs to. The Data Layers window should support 'browsing' as well as 'searching' when one already knows what they are looking for. See page 54.





# **Legend Window**

The purpose of the Legend window is to give an overview of all the data layers that are toggled on at the time of viewing and define the visuals in the interactive map.

The Legend window used to be called the 'Active Layers' window in previous editions of MSP Challenge. It got renamed to better convey its purpose, mainly to users with a background in spatial planning or sciences, which makes out a fair percentage of our target audience. The term legend is more conventional and frequently used in geospatial data software. See page 56.

Previously, whenever a data layer got toggled on through the Data Layers window, which acts as a catalogue, its contents were visualized on the interactive map and its name appeared in the list of the now Legend window, indicating that it was active. When a data layer got toggled off again through the Data Layers window, the visualization on the map would disappear, but the name of the layer would remain in the list of the Legend window, only with the toggle in front of its name turned off.

The only way to remove a data layer from the list permanently was by either selecting the cross button behind its name, which would discard the individual layer, or by selecting the 'Clear All' button at the bottom of the Legend window, which cleared the whole list in one go.

This mechanic caused the Legend list to fill up quickly, since every single data layer that was ever toggled on in the Data Layers window would appear and remain in the list. While exploring the abundance of data layers from the catalogue in early game, many users didn't think of regularly removing layers that weren't of interest from the list. A clogged-up Legend list has the opposite effect of what it should have. Instead of providing a clear overview of the data layers that are considered of interest for the creation of a spatial plan, the list becomes so long that users often didn't bother to sort through it. It took too much time to find a specific layer, so instead they cleared the whole list and proceeded to look up the layer again in the Data Layers window once they were done exploring and wanted to start creating an actual spatial plan.

During the redesign of MSP Challenge, this mechanic was changed, and a couple of additional functions were introduced to make it more user friendly. <u>See page 57.</u>

Now, toggling off a data layer through the Data Layers window not only removes the visuals from the interactive map but also removes the layer's name from the Legend list. If one wishes to keep a data layer active at all times, they can choose to 'pin' it by selecting the pin icon in front of the layer name in the Legend window, inherently locking it in place. This avoids the risk of discarding a data layer from the list by accidentally toggling it off in the Data Layers window or by selecting the 'Clear All' button in the Legend window.

This function allows users to explore and sort through the extensive data layer catalogue, while easily saving data layers of interest and discarding the rest. Once pinned, the pin icon in front of the data layer in question turns orange. The layer can be unpinned again by selecting the icon a second time, after which it will return to its original light gray appearance. Individual data layers can still be discarded from the list by selecting the cross button behind the name, without first having to untoggled it. This is, however, the only way a pinned layer can be permanently removed from the Legend list. The 'Clear All' button only removes unpinned layers.

Something that has remained the same across versions is that each data layer has a comprehensive legend which explains the various colours, gradients, icons and patterns on the interactive map. The legend can be accessed by selecting the drop-down arrow behind a data layer's name in the Legend window.





# **Impact Tool**

The purpose of the impact tool is to provide the users with an overview of how various marine and maritime elements influence each other, so they can better scope the potential impact of their ideas, if they were to be implemented into spatial plans.

The original version of the impact tool opens as a fixed size window in the middle of the screen. It can be freely dragged across the screen but not resized. Users can navigate through the contents of the window by clicking the right mouse button and dragging the mouse simultaneously into any direction.

The layout is based on a Voronoi diagram. Various marine and maritime elements of interest are thematically and physically categorized under multiple umbrella terms. Example: the element 'wind farm' falls under the category 'energy'.

When selecting an element within a category, various lines spawn, connecting the originally selected element with other elements which it influences. The colour of a line indicates whether the impact is positive (green) or negative (red). The thickness of a line represents the severity of the impact.

The issue with this approach is that the categories and various elements inside them spawn randomly across the window. There aren't very detailed layout rules and not all elements are visible at the same time even when the window is scaled up to its maximum size. This impacts the clarity of the overview.

In the redesign of MSP Challenge, hierarchical edge bundling was implemented as per suggestion of Fedor Baart from Deltares. This allows to visualize adjacency relations between elements organized in a hierarchy. By bundling the adjacency edges together, it decreases the clutter usually observed in complex networks.





## **Active Plan Window**

The purpose of the Active Plan window is to reduce the number of steps required to create and / or edit a plan, and to combine as many of these steps into one location.

Previously, plan creation and editing required the users to go through multiple steps dispersed over various windows. See page 62, 63 and 64.

First, users are required to fill in a plan name, select the data layers and policies (optional) of choice, and pick an execution date within the plan wizard window.

Once this is done, the plans monitor window automatically opens, in which all the existing spatial plans of the different teams can be viewed. The newly created spatial plan is preselected by default and its contents can be viewed by expanding the window to the right using the arrow button in the header. Simultaneously the active plan window will open in view mode, in the bottom left corner of the screen.

The plans monitor window has multiple tabs, containing various information about the spatial plan. In order to make changes to the data layers of the spatial plan, the user must travel to the layers tab and select the edit button.

The active plan window will expand into edit mode. The users can select one of the data layers that have previously been added to the spatial plan and either select the edit button to make changes to the existing geometry within that layer, or the create button to draw new geometry from scratch.

Once the users have made all the required changes, they need to be permanently implemented by selecting the accept button.

If the users wish to remove or add an additional data layer to the spatial plan, they are required to exit the Active Plan window's edit mode by either accepting or canceling the changes, return to the Plans Monitor window, select the relevant spatial plan and then select the change details button in the top right corner, in order to reopen the Plans Monitor window in which the original details of the plan were drafted and can be altered.

The active plan window got introduced in MSP Challenge RC1 release. See page 65, 66 and  $\overline{67.}$ 

Reducing the number of required steps / clicks, helps enhance the general flow and clarity of the game. The user is less likely to become overwhelmed if the steps and the information are to the point.

Combining steps and functions that are (thematically) connected and need to be used hand-in-hand into one location reduces the strain on cognitive load.

It isn't ideal if the user needs to remember how- and where to navigate to (especially if the locations are numerous). This reduces the risk of the user getting side-tracked or even 'lost' in the process.

Embracing a complete redesign and combining various steps into one location will allows us to create more consistency in the UI, as many of the current windows were designed and tweaked at different times.

This a good opportunity to implement consistent window layouts, terminology, colours, icons, interactive elements such as buttons, on-hover information etc.

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#### Plan Wizard 1. Provide a plan name 2a. Select layers to change in this plan, if relevant Layers 🔻 ⋟ Governance 🔻 🐣 Shipping Dumping areas Sand & Gravel Extraction IMO Routes National Shipping Lanes No shipping zones Anchorages 2b. Select policies to change in this plan, if relevant Safety zones Energy distribution Fishing efforts 3. Set a realisation date Project should be finished by August Construction will initiate in August 2042 (0 months construction time)

Cancel This plan does not have a name yet. Accept >





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▶ Timeline



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## Main Menu Bar

## The purpose of the Main Menu bar is to provide the users with a clear point from which to open various windows and access the game's multiple features.

Together with the Time View window, the Main Menu bar is the only UI element in MSP Challenge that is visible at all times. These two elements used to be one in the previous version of MSP Challenge. All other UI windows can be opened and closed at will.

Previously, the Main Menu bar was horizontally positioned at the top of the screen. Since there was a fair amount of unused space within the bar, it was rotated vertically and repositioned to the left side of the screen in the new version of MSP Challenge. The bar retains an adequate amount of breathing space between the various buttons, while reducing the amount of overlap with the interactive map, which should always remain as unobstructed as possible.

When selecting a button in the Main Menu bar, the windows used to open in various locations on the screen. Most of the time, the horizontal location coincided with the side on which the button was positioned in the Main Menu bar, but this wasn't fully consistent as some windows opened centered within the screen and could be dragged around while the side windows were locked in place. This caused some confusion on where to expect a window to open and in what manner a user could manipulate said window. It also limited the possibilities of how to distribute and thematically group the buttons in the Main Menu bar, as they needed to remain on the same side in which the window opened, also taking into consideration certain windows were often used-and therefor needed to viewed at the same time.

By rotating the Main Menu bar and placing it on the left side of the screen, it automatically got rid of the biased expectation that a window should open on a specific side, based off its button position.

Now, all windows either open on the left or centered, with the Active Plan window being the only exception. It was important to place the Active Plan window somewhere where it would still allow other windows to be opened simultaneously without overlap. Since the Active Plan window is very tall and takes in the majority of the vertical screen space, placing it on the right-hand side seemed the best approach.

In this new layout, the buttons are grouped depending on their function: the data layers and legend button represent the explorative functions. The impact tool, objectives monitor and three KPI buttons are for estimations and reviewing; and everything that is related to spatial plans, such as the plan creation and plans list button also form their own category.





## **Online Platforms**

The MSP Challenge simulation platform software is accompanied by three online platforms; the main MSP Challenge website, the knowledge base and the community wiki.

**The main website** acts as a landing hub for (potential new) users. It introduces visitors to the MSP Challenge, the different products part of the MSP Challenge (the simulation platform, the board game and 3D ocean view), and news announcements.

The knowledge base contains detailed information on the real-life facets of all data layers available inside the MSP Challenge Client. Its contents can be accessed standalone via the website, as well as during an MSP Challenge session to improve the overall planning process. The knowledge base is partly community run; we try to encourage users to help expand the knowledge base by updating the various pages with information. Once submitted, the entries are reviewed the MSP Challenge Team and released online once they got approved.

**The community wiki** is a separate <u>Media Wiki</u> dedicated to the MSP Challenge Simulation Platform and the Board Game. It contains all the information, documentation and support needed to understand, install and use the two products. First time users are required to create an account.

All three websites have been updated to fit the RC1 redesign of the MSP Challenge Simulation Platform software.

# MARITIME SPATIAL PLANNING CHALLENGE



Before

#### WHAT IS THE MARITIME SPATIAL PLANNING CHALLENGE?

Human activities at sea such as off shore In the interactive simulation, country MSP Challenge integrates best available



# Maritime Spatial Planning Challenge

Next Generation Planning Support

Install Software

Community Wiki

After



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HOME PRODUCTS USE IT FOR... COMMUNITY ABOUT FAQ

#### HOW IT WORKS

In the simulation platform, multiple users have an overview of an entire sea region, such as the North Sea, the Baltic Sea or the Clyde Marine region. Users can review many different data layers provided by

Future plans for energy, shipping, fishing and the marine environment are simulated. The effects are presented in indicators and heat maps, such as for biomass, energy production, shipping

licators and heat maps, such as for They can define session duration and omass, energy production, shipping start/pause/speed up and slow down time

Moderators can set up interactive

sessions with multiple users representing

different countries or sectoral interests.

## Before



# MSP Challenge Simulation Platform

Coming soon to a sea near you...

Install Software

Feature Tutorials

After



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#### WHAT IS THE MARITIME SPATIAL PLANNING CHALLENGE?

Human activities at sea such as off shore wind farming, shipping and fishing, easily get into each others way. And they have a long term impact on the marine environment. Maritime Spatial Planning (MSP) Challenge has been designed to help decision-makers, stakeholders and students understand and manage the maritime (blue) economy and marine environment. In the interactive simulation, country planners and stakeholders see the entire sea region and review many different data layers to make an assessment of the current status. They develop plans for future uses of sea space, over a period of several decades. The consequences of decisions for energy, shipping and the marine environment are simulated and visualized in indicators and heat maps. MSP Challenge integrates best available geo, maritime and marine data with simulation models for ecology, shipping and energy production. Using advanced game technology and game thinking, MSP Challenge is designed to engage and immerse users, making it a perfect environment for stakeholder engagement, planning through co-design, learning and education.

The use of the MSP Challenge simulation platform is open source and free of charge. Anyone can use, or play, online via our servers. Or install your own server. An edition of the MSP Challenge board game can be purchased at a realistic price. VR and AR applications are under development.

#### USER COMMUNITY

INSTALL SOFTWARE

TERMS AND CONDITIONS

## Before

### — What is the MSP Challenge? —

Human activities at sea such as offshore wind farming, shipping and fishing, easily get into each others way. And they have a long term impact on the marine environment. Maritime Spatial Planning (MSP) Challenge has been designed to help decision-makers, stakeholders and students understand and manage the maritime (blue) economy and marine environment. In the interactive simulation, country planners and stakeholders see the entire sea region and review many different data layers to make an assessment of the current status. They develop plans for future uses of sea space, over a period of several decades. The consequences of decisions for energy, shipping and the marine environment are simulated and visualized in indicators and heat maps. MSP Challenge integrates best available geo, maritime and marine data with simulation models for ecology, shipping and energy production. Using advanced game technology and game thinking, MSP Challenge is designed to engage and immerse users, making it a perfect environment for stakeholder engagement, planning through co-design, learning and education.

### — Our Vision —

We see a need to innovate the way we talk, discuss, learn, make plans and take decisions about our seas and oceans. We have to look at the sea from a broader and longer term perspective. Learning to go beyond self- and short-term interests. We think that planning and decision-making about aritime economy and marine ecosystems can become more

reality, we can connect geo, maritime and marine data, with eco modelling and maritime simulations. The MSP Challenge is a communitybased, open source and non-profit initiative, since 2011. Thousands of people around the world have experienced the MSP Challenge simulation

By making use of emerging digital technologies, such as games and virtual

### After

POWERED BY WEEDLY


Welcome to the MSP Challenge user community wiki. It gives you all the information, documentation and support you need to understand, install, use and communicate about the MSP Challenge simulation platform. We work hard to keep the user community updated. However, it is always possible that software development, documentation and support are not 100 percent aligned. Ready to contribute or start using the software? Get an account @ and log in @.

## **MSP Challenge Simulation Platform**

Installation	Usage	Session moderation & setup	Technical information
<ul> <li>Download</li> <li>Technical requirements</li> <li>Installation manual</li> <li>Terms &amp; Conditions</li> <li>Release notes</li> </ul>	<ul> <li>Feature overview</li> <li>Feature tutorials</li> <li>Frequently Asked Questions</li> <li>Connecting to a server</li> <li>Controlling your own server</li> </ul>	<ul> <li>What you need for a session</li> <li>How to design a session</li> <li>Customise your session</li> <li>Handouts for players</li> <li>Materials for facilitators</li> </ul>	<ul> <li>Current geo-data sources</li> <li>How to add or update geo- data</li> <li>Current simulations &amp; models</li> <li>GeoServer</li> <li>Source code contributions</li> </ul>

## After