

Data-driven Waterrecreation



Dr Jessika Weber Sabil
Sr Researcher BUas
weber.j@buas.nl

Jorrit Bijl
Project Manager CELTH
j.bijl@hz.nl



Aim of the Session

Proposal of a research project supporting the planning process of water recreation using (big) data

Sharing ideas for a research program/project

How can we include (big) data in the planning process of water recreation to support tourism decision making?



Project background- Smart City Hospitality



- ERA-NET – JPI Urban Europe **Project** (joint program of national scientific research funding organisations) total budget EUR 1.4 Mio
- **International research partners**
- **Support policymakers** and other **stakeholders** by developing insights and tools that support so-called deep **reflections** about sustainable urban tourism development



Research Partners



Participating Cities- Smart City Hospitality



Belgrade

Changing river-side with huge external investments



Darmstadt

Business & heritage travel - Applying for UNESCO world heritage



Amsterdam

One of the most visited cities in Europe, high visitor pressure



Gothenburg

Event City relying on air transport and faces social divide challenges



Valencia

MICE tourism and day visitors



Stavanger

Focus on tourism to compensate for oil industry.

Problem Statement-Smart

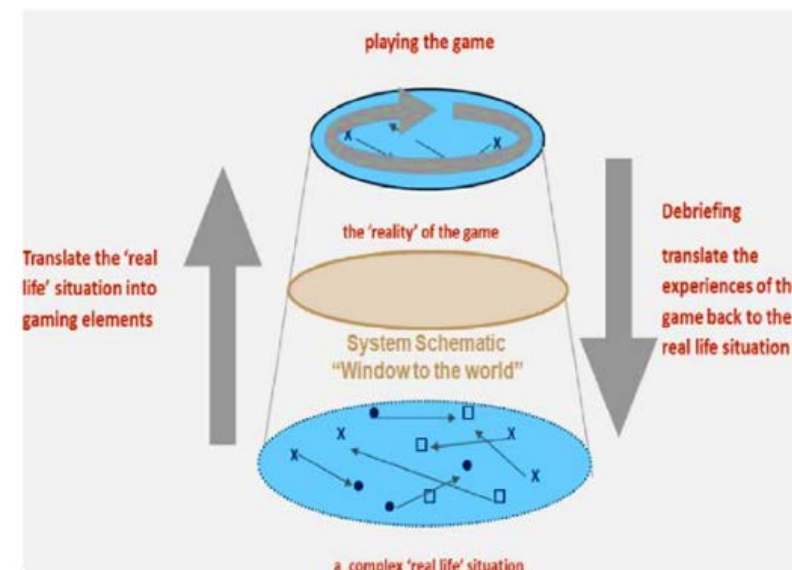
- Increasing challenges around tourism growth in urban destinations (Koens et al., 2018)
- Changing tourism paradigm (Sola & Cooper, 2019)
- Lack of inclusive participatory planning practices for tourism (Lalicic & Önder, 2018)
- Lack of innovative and disruptive methods to support planning (Mata, 2019)
- Limited focus on process of governance in urban tourism planning (Gurran & Phibbs, 2017)

“How can serious gaming enhance stakeholders’ engagement with sustainable tourism planning in urban destinations?”

SCITHOS Board Game

Collaborative tool to reflect on the role of tourism

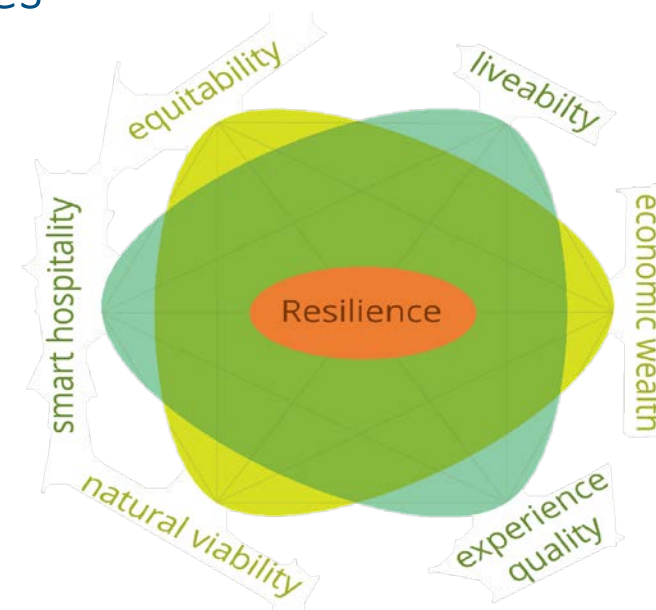
- **Discussion tool** for engaging stakeholders from tourism planning to discuss about sustainable tourism
- Engage Stakeholders into a constructive dialogue
- Disruptive manner to **bring** stakeholders **together** - room for **dignified disagreements**
- Jointly '**design**' future destinations by trying out different scenarios



The Board Game

- Trade-offs between SCITHOS Values
- The developed framework serves as the reference point as it
 - Illustrates the complexity of planning tourism destinations
 - Frames the discussions in a tourism-specific manner
 - Stimulates context-specific discussions during the serious gaming policy sessions

- Predictive power
 - Predict number of visitors and what they do and in what places
 - Used to estimate during planning purposes



Player Survey SCITHOS Board Game

Darmstadt (n=13)

Valencia (n=11)

Gothenburg (n=12)

Stavanger (n= 9)

Total sample: 45 players

- **Average age:** 44.7 years old
- **Gender:** 26 females (56%), 20 males (44%)
- **Practice:** 25.5% (International), 27.5% (National), 23.5% (regional), 23.5% (local)
- **Sector:** 53% (public), 28%(private), 15%(non-profit), 2% (other)

Player Survey SCITHOS Board Game

<i>Game Experience</i>	Mean	St.D
I think it is easy to learn how to play the game	3.79	0.74
I think the game is visually appealing	4.30	0.67
I feel creative when playing the game	4.21	0.70
I think the game is fun	4.53	0.50
I enjoyed playing the game	4.53	0.60
I would recommend this game to others	4.49	0.63

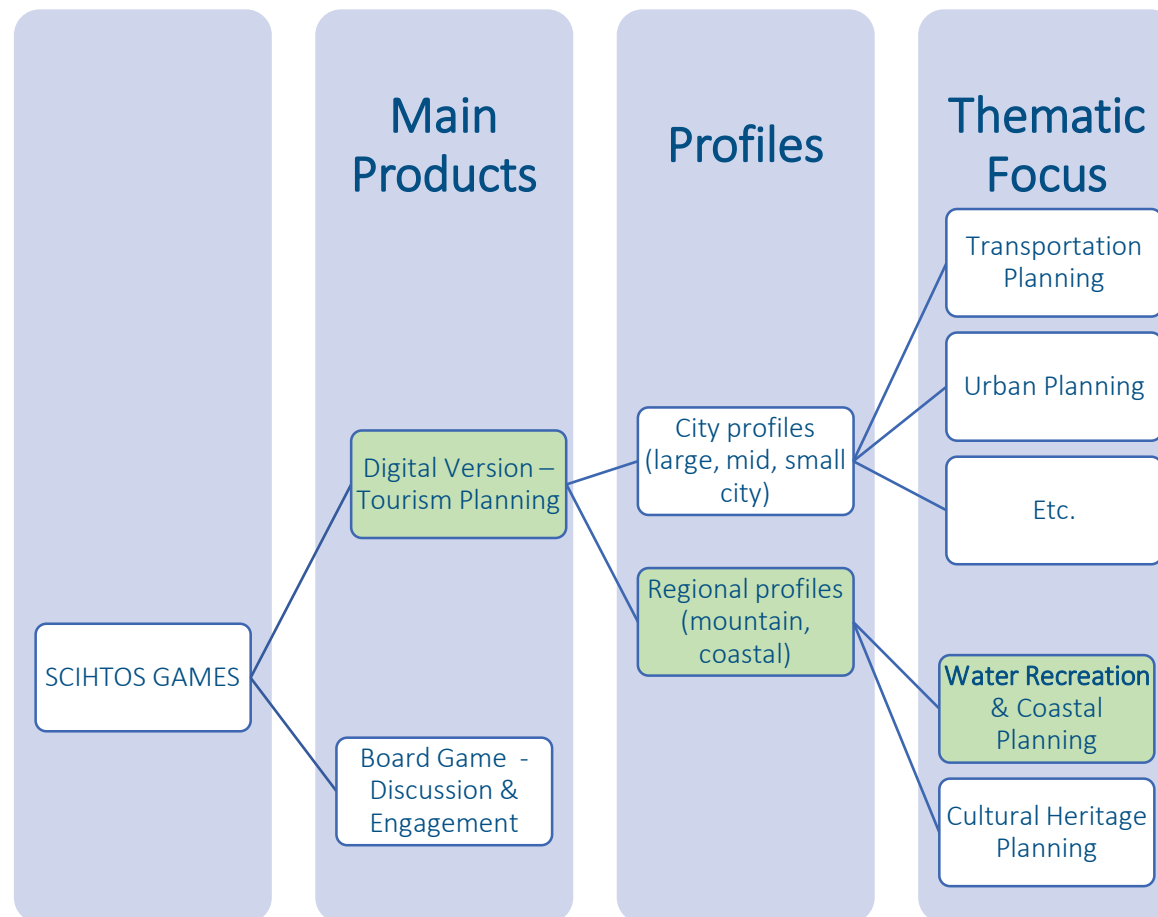
<i>Game Effectiveness</i>	Mean	St.D.
The game promotes urban planning between stakeholders	4.50	0.62
The game promotes good communication between stakeholders	4.56	0.56
Through my participation in the game, I gained new insights in the complexity of tourism planning	4.27	0.93
The game has shown long term effects and pitfalls of tourism planning	4.12	0.69

* 5. Likert-scale

Player Survey SCITHOS Board Game

- Need to **cooperation** is essential'
- 'Great to get **better insights** into the complexity of planning a destination'
- 'Dependence of stakeholders is high when planning tourism'
- 'Including everyone is crucial but residents are easily forgotten'
- 'Fun to play and learn at the same time'
- 'Great to meet other stakeholders that I would normally not meet or see'

Aim of the Session – Proposal



Next Step - Digital Version of SCITHOS

Based on a simulation model

- Agent-based model
 - For short-term predictions / behaviour
 - # visitors and #inhabitants fixed
- System Dynamics
 - Long-term predictions / behaviour
 - # visitors and #inhabitants can (and will!) change

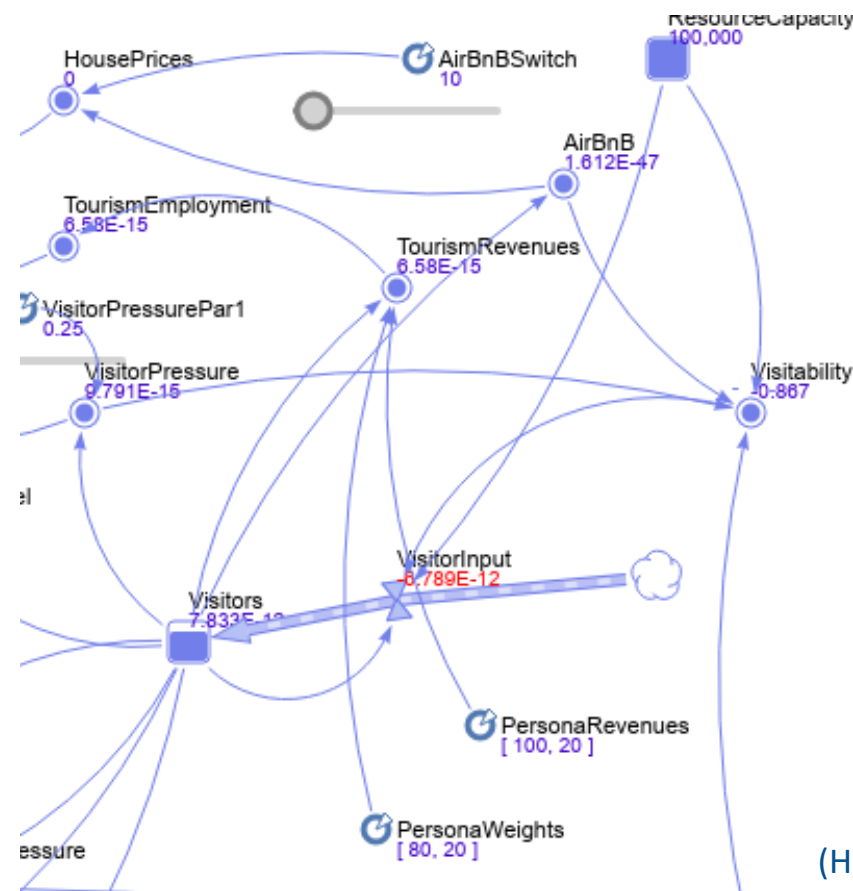
Switch between both models possible

(HZ Zeeland)

System Dynamics Model

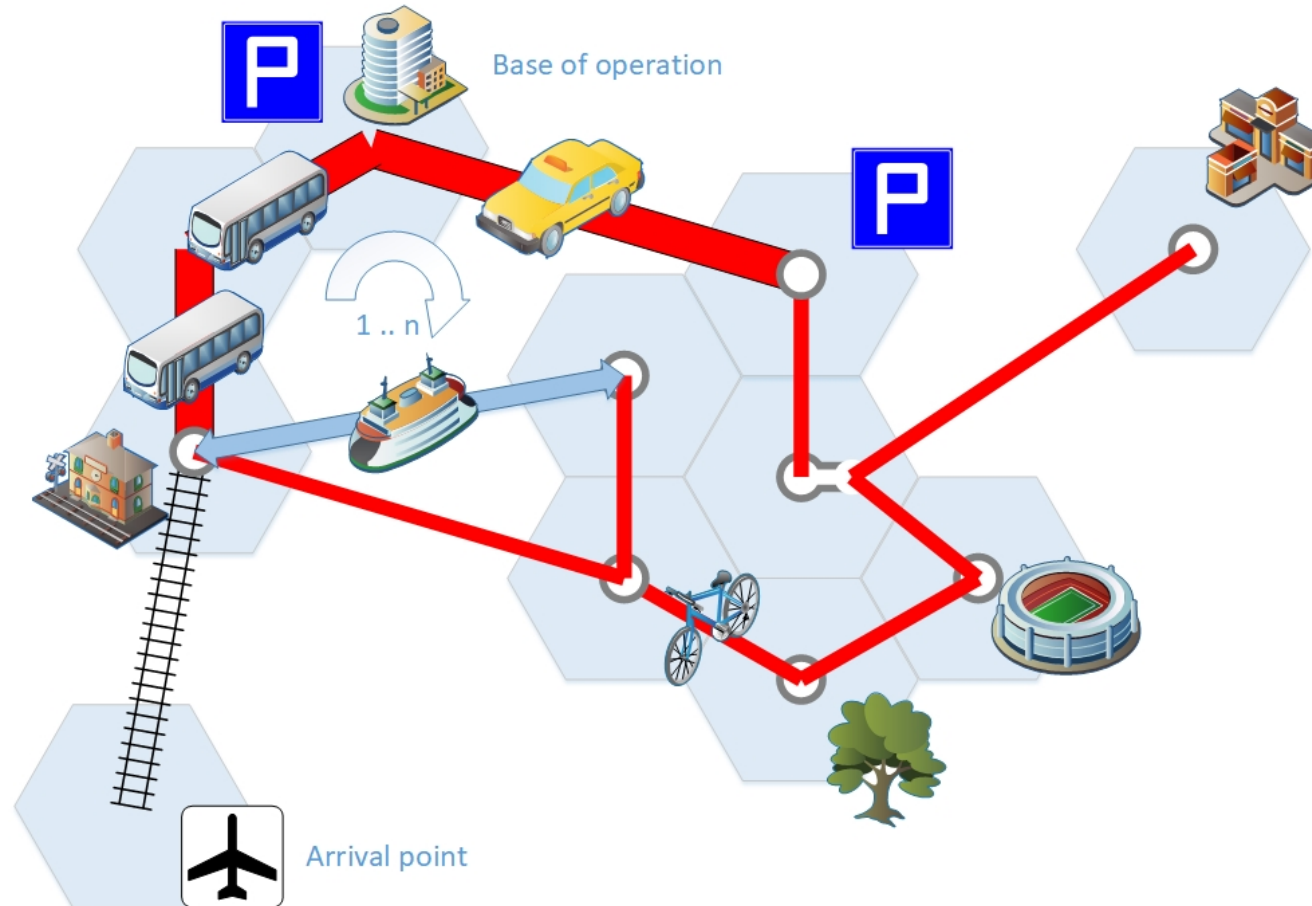
- Number of visitors varies
- AirBnb $\downarrow \uparrow$
- Economy $\downarrow \uparrow$

Prototype already working with data from Zeeland



(HZ Zeeland)

Agent Based Model



(HZ Zeeland)

Possible Data

Personas

- Define different type of tourists/inhabitants
- Bucket list (e.g. surfing, cycling) based on preferences of persona

Resources

- Instance of a persona performs activities using resources (e.g. boat hire, diving areas)

Areas

- Resources are positioned in areas (POI, field)

Persona	Resource type	percent	nextactivityuse	afterwardsactivity	afterwardsactivityp
Business_Tourist	Eating_in_good_quality_restaurants	0%			0%
City_as_base	Visiting_region	100%	-5 -5 -100	Dining	80%
Business_Tourist	Visiting_historical_landmarks	80%			0%
Business_Tourist	Eating_in_budget_restaurants	30%			0%
Business_Tourist	Eating_in_hotels	25%			0%
Business_Tourist	Visiting_parks	60%			0%
Business_Tourist	Sitting_on_terrace	50%			0%
Business_Tourist	Festival	20%			0%
Business_Tourist	Organised_Walking_tour	40%			0%
Business_Tourist	City_bus_tour	30%			0%
Business_Tourist	Spa_visit	2%			0%
Business_Tourist	Watching_sporting_event	2%			0%
Business_Tourist	Visiting_friends_and_relatives	6%			0%

(HZ Zeeland)

Possible Data – Bucket List

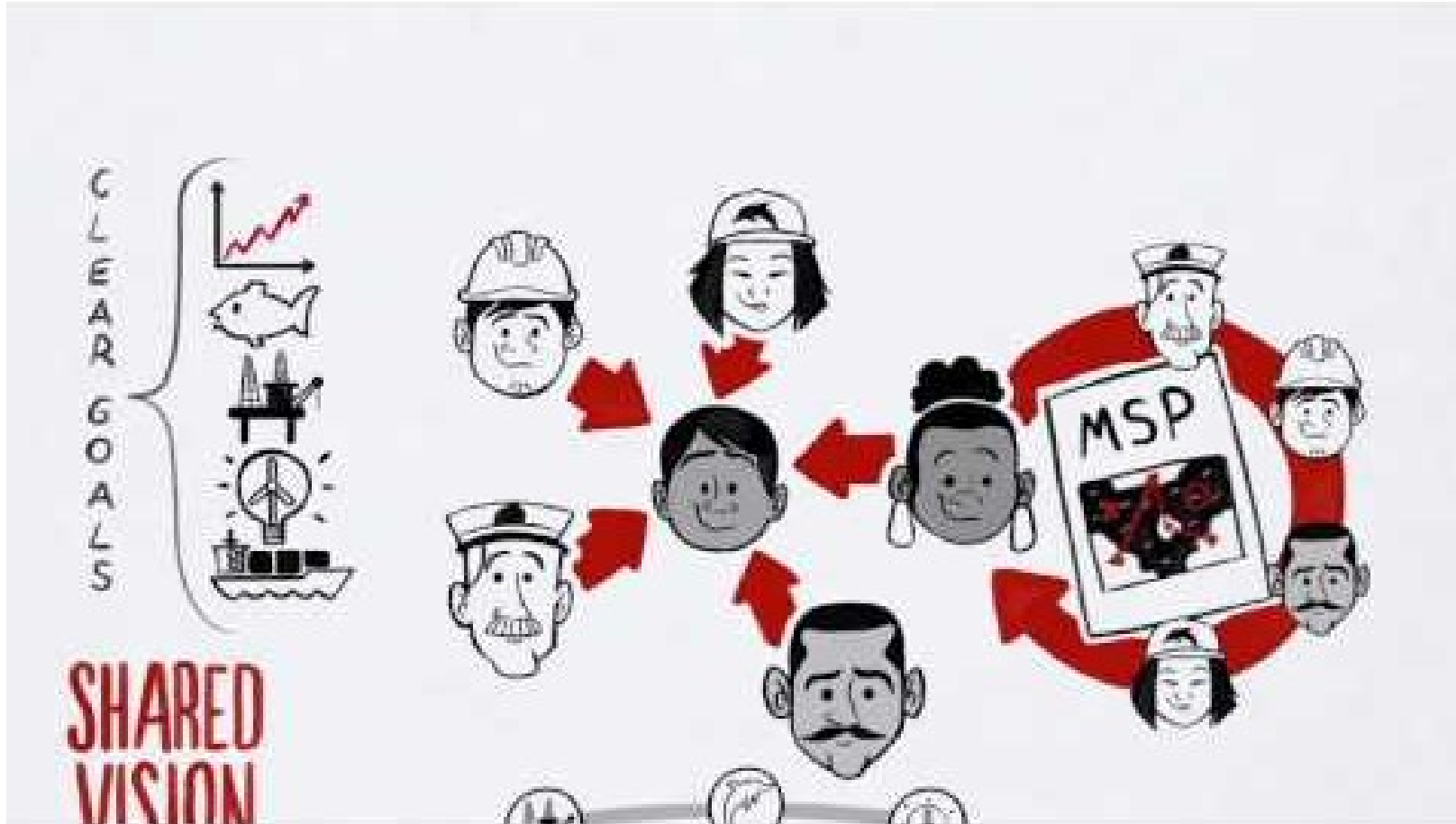
	Carrying capacity	Rate of use	Environmental Impact Measures				Livability impact measures
Persona Activities			Co2 Emission	Noise Level	Safety	Water Quality	
Fishing (sea, fresh water)							
Diving with equipment							
Swimming							
Walking near water							
Jet boat experience							
Ice-skating							
Canoeing							
Stand-up paddling							
Wind surfing							
Rowing							
Camping							



Example Project

Maritime Spatial Planning (MSP)

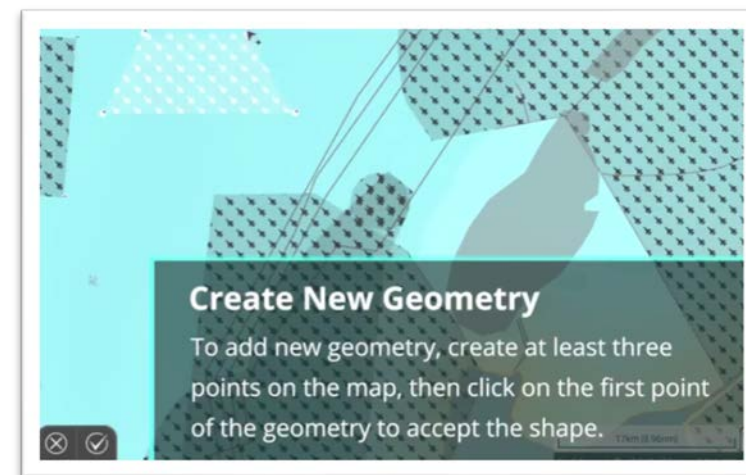
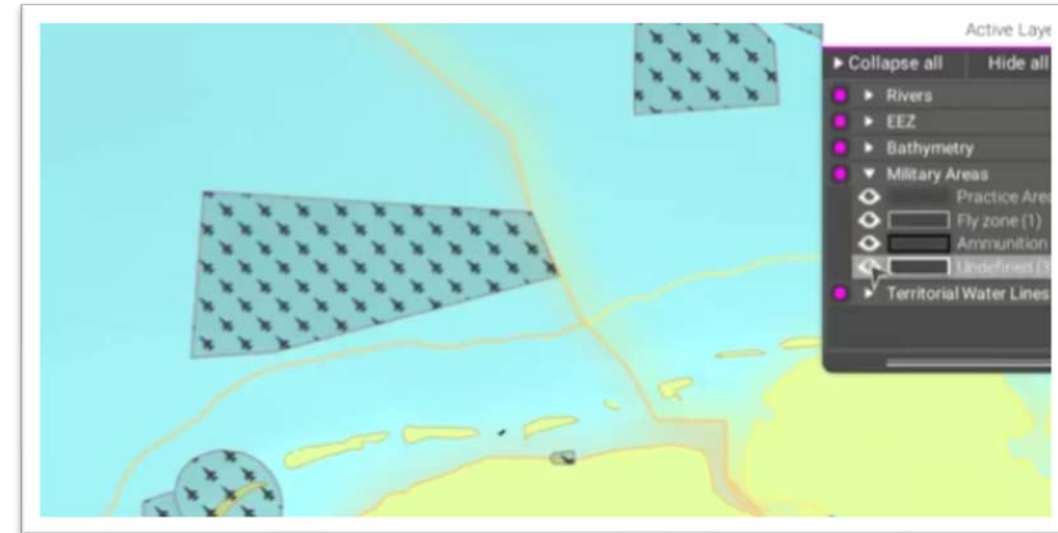
What is MSP Challenge?



<https://www.youtube.com/watch?v=HZu4QSRis7U&t=16s>

Data in MSP Challenge

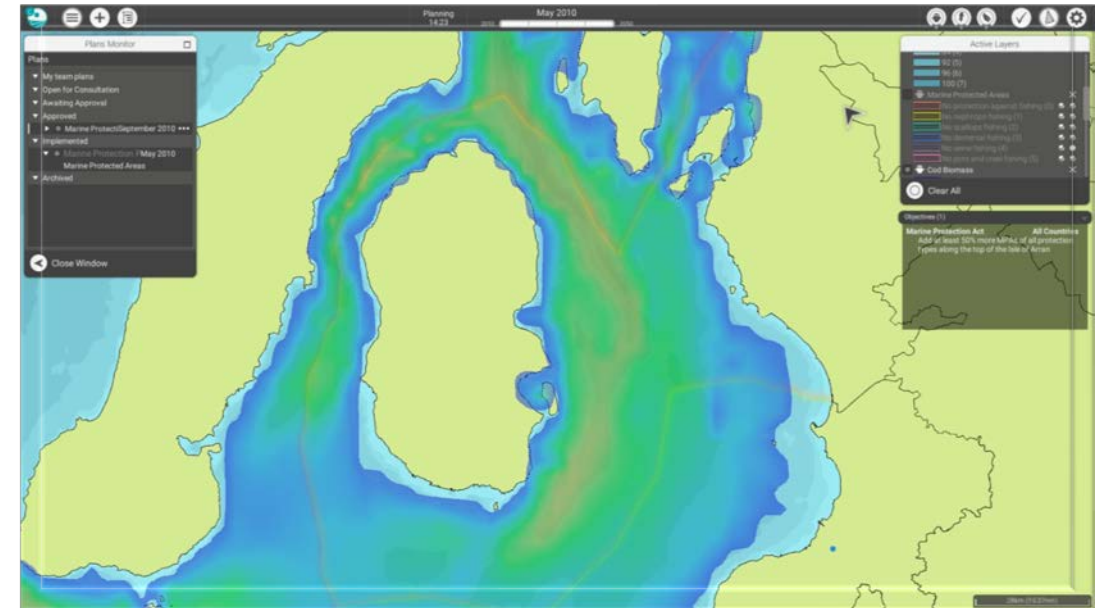
- **Static data** imported from geographical information systems (GIS) sources
- **Dynamic data** created by users/players in same GIS format
- **Background simulations** (shipping, energy, ecosystem at present) take different input data and provide different output data, both geographical data (points, lines, polygons, rasters) and non-spatial KPIs
- Background simulations also interact with each other, e.g. output data of shipping simulation is also input data ecosystem simulation

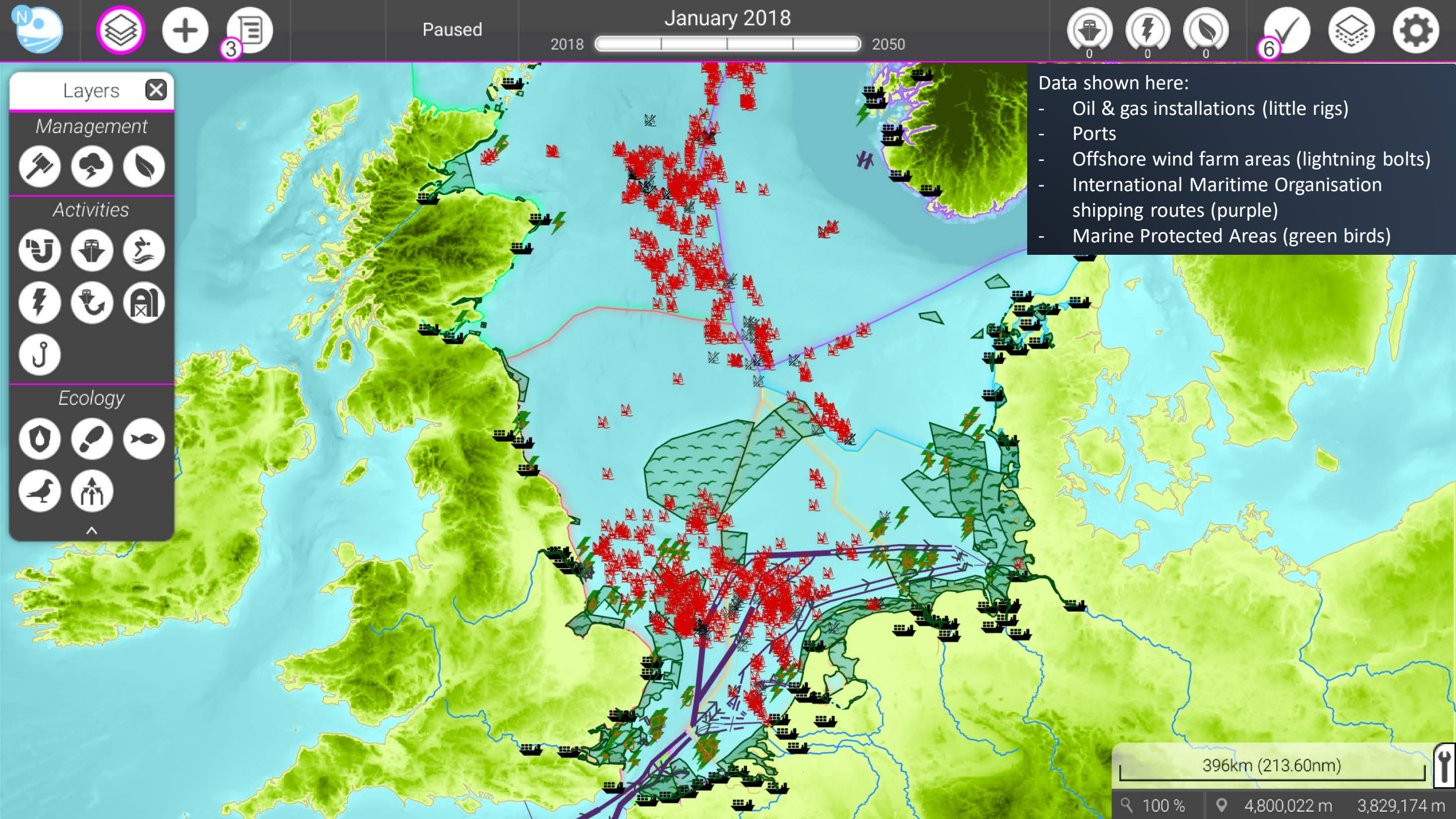


Data in MSP Challenge

Background simulations

- Both geographical data (points, lines, polygons, raster) and non-spatial KPIs
- Shipping routes, energy (oil, gas, wind), ecosystem (birds, fish, protected area) at present take different input data and provide different output data (future)
- Interact with e.g. output data of shipping simulation is also input data ecosystem simulation (e.g. change bird population based on wind farm plans)





Value of all this data for MSP Challenge

Innovation:

- Re-use of existing, real-life, validated, freely available GIS data
- Novel interconnections between thus far separate validated simulations

Interactivity:

- Users/players can update data in a more user-friendly interface & playful setting
- User/players can develop and explore future scenarios for a sea basin together

Decision-making:

- Towards a more integrated, scenario-based, extensive planning support system
- With the added value of a playful approach: trial and error, trial and error

Discussion

If we were to design a system for water recreation, which factors should be included and how can we collaborate and contribute....

- Insights & knowledge
- **Data**
- Network
- Funding

References

- 1 Gurran, N. & Phibbs, P. (2017) When Tourists Move In: How Should Urban Planners Respond to Airbnb?, *Journal of the American Planning Association*, 83:1, 80-92, DOI: [10.1080/01944363.2016.1249011](https://doi.org/10.1080/01944363.2016.1249011)
- 2 Koens, K., Postma, A. and Papp, B. (2018). "Is Overtourism Overused? Understanding the Impact of Tourism in a City Context." *Sustainability*, Vol. 10, No. 12, pp. 4384
- 3 Mata, J. (2019). "Intelligence and Innovation for City Tourism Sustainability." In Sola, E.F. and Cooper, C. (Eds). *The Future of Tourism*, Springer, Cambridge, pp. 2123-232.
- 4 Metin, T. C., Katirci, H., Yüce, A., Sariçam, S., & Çabuk, A. (2017). An inventory study on the categorization and types of recreational activities. *Journal of Academic Social Science Studies*, (59), 547-561
- 5 Solà, F. E. and Cooper, C. (2019). "Conclusion: The Future of Tourism—Innovation for Inclusive Sustainable Development." In Sola, E.F. & Cooper, C. (Eds). *The Future of Tourism*, Springer, Cambridge, pp. 325-337.

Presentation in collaboration with HZ Zeeland (Hans de Bruin and Anton Bill)