Salt, Chemistry and Cultivation

UNESCO Media Arts Exhibition @SXSW

The “Salt, Chemistry and Cultivation” video installation immerses viewers in a data landscape, conveying the complex biogeochemistry in the Gulf of Mexico via a handcrafted visual language made possible through a creative interplay of traditional artistic media and computer science algorithms.

The Process: Physical paint, clay, ink, rice noodles, shaved wax, found objects, and more are crafted and curated by artists as visual building blocks. The results are then scanned into a digital form, and artists use custom software developed by the interdisciplinary team to automatically build an immersive, interactive virtual data world by locating and morphing the once-physical artifacts in direct response to data from supercomputer climate simulations.

The Climate Science: Salt, Chemistry, and Cultivation highlights the actual data climate scientists are using today to identify optimal locations for sargassum cultivation, a macro-algae that is not only well-suited for bio-fuel production but, if cultivated responsibly, could help restore the biogeochemistry of the Gulf of Mexico to a more natural state. Climate scientists are adopting a new style of visual data analysis to better meet the serious challenge of understanding the complex interrelationships between temperature and salinity, chlorophyll and nitrate levels, as well as the strength and direction of the currents, all of which are depicted in this installation.

The Team: This work is a collaborative effort between artists and computer science visualization researchers at the Texas Advanced Computing Center, University of Texas at Austin, the Interactive Visualization Lab at the University of Minnesota as well as climate scientists from the Los Alamos National Laboratory. The project is supported in part by the National Science Foundation (IIS-1704604, IIS-1704904). Data were produced using the DOE Office of Science Biological Environmental Research Energy Energy Exascale Earth System Model (E3SM) and was analyzed under the Advanced Research Projects for Energy Macroalgae Research Inspiring Novel Energy Resources program.