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Adaptation Support Tool to reduce flooding in New Orleans

Hurricane Katrina had a devastating impact on New Orleans more than ten years ago. A large part of the city has now been rebuilt, directions for future water management have been laid out in the Greater New Orleans Urban Water plan (2013) and the coastal defence and pumping stations are largely in place. The major water challenge that remains is pluvial flooding. The Adaptation Support Tool has been implemented in New Orleans to facilitate the design of green infrastructure in collaboration with multiple stakeholders.

The traditional approach of increasing drainage capacity would seem to be less cost-effective and less sustainable than green-infrastructure solutions. New Orleans therefore wants to design and implement green-infrastructure solutions in collaboration with local stakeholders to reduce pluvial flooding. To facilitate the design process for green-infrastructure, Deltares developed the Adaptation Support Tool that was improved and customised for New Orleans.

Many stakeholders are involved in the creation of a climate-resilient New Orleans. Stakeholders include urban planners, landscape architects, water managers, civil engineers, local residents and other experts. The touch-table-based system AST was used in collaborative design workshops to create conceptual designs with, and with support from, the stakeholders. The AST facilitates planning support, the selection of adaptation interventions, interactive placement in the project area and the immediate assessment of effectiveness and costs.

The AST touch table consists of three panels. The left panel is for the input of local conditions and the selection of measures from a ranked list based on these conditions. The AST now includes 71 blue, green and grey measures for ecosystem-based adaptation. Typical examples of “blue-green” solutions are green roofs, bioswales, porous pavements and water squares. New measures added specifically for New Orleans included French drains, dry ponds, tree cells and bio-retention cells.

The centre panel shows a map of the project area with base layers such as Google maps and Openstreetmap.org and thematic layers (such as a digital elevation model and a flood map). The participants can draw the suggested measures on the map. The right panel then shows an assessment of the effects of the measures using a number of key metrics that include storage capacity, heat stress, flood reduction, the effects on water quality, the cost and additional benefits. In the case of New Orleans, groundwater recharge and evapotranspiration were added as key metrics because they are relevant for land subsidence and heat stress reduction.

The advantage of the AST is that participants immediately see the effects of the interventions they propose. The estimated effectiveness is shown, for example, as a percentage of the desired retention capacity, flood reduction and groundwater recharge. The AST is part of the Adaptation Planning Support Toolbox to support the complete collaborative design process in both the initiative phase and the planning phase.

Further reading:

van de Ven et al. (2016)
http://dx.doi.org/10.1016/j.envsci.2016.06.010.