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## SITE: THE RHINE DELTA – THE RHINE MOUTH AT LAKE CONSTANCE

by Christophe Girot and James Melsom

Aerial view of the Rhine Delta site (Source - Vorarlberg GIS)



The mouth of the Rhine, located on Lake Constance at the border between Switzerland and Austria, presents the main focus for the 07/08 MAS LA design studio. The zone, while locally referred to as the Rhine Delta, no longer geologically acts as a delta since the isolation of the area over a century ago by 'corrected' river profiles.

Over the last hundred years, the formerly dynamic landscape of this delta has become increasingly static. Civil engineering interventions have negated the natural processes of tide, inundation and drainage inherent to the river and lake, in order to transform the site with modern land use infrastructures, agriculture, and urbanism. Today, the demands upon this landscape continually change in terms of appropriate measures of urbanism and transportation, agrotourism, and biological reserves.

The Rhine Delta, a site located between the 'Old Rhine' and the 'Rhine Correction' and measuring approximately 3000 hectares, is the subject of a design investigation with respect to long-term landscape architectural transformations capable of contributing to the aesthetic improvement and safety of this flood-prone area. The huge site features an extremely subtle topography operating within a 5 meter range, with dikes, roads, and drainage canals providing the largest height differences. This is a highly complex site collecting all the waters of northeastern Switzerland and Lichtenstein. It has experienced major hydrological problems due to the rapid urbanization of the new floodplain left by the water correction of the late 19th century. Relatively closed off from neighboring cities and mountains, it is a place between land, mud, and water. In 2001, the construction of the 'polder dam' along the entire shoreline of the Rhine Delta created a per-

manent separation between the site and the lake, regulated year-round by pumping stations along the shore. The reconceptualization of a new shoreline and waterway landscape formed a central theme of this design task.

Students were asked to question the static condition of the lakeshore and river and retrieve and incorporate a seasonal and dynamic dimension to the site. In addition, they were asked to question the 'static' nature of the present situation and project ambitious new relationships between landscape, water, and dwelling. The working hypothesis proposed for the Rhine Delta site is that a large-scale landscape development strategy is needed to redefine and restore the hydraulic patterns of the area located between the Old Rhine and New Rhine Canal and adapt urban growth accordingly. The basis for each design was the modelling of a new topology for the Rhine Delta site. Within each design project, a scenario was developed addressing the manner in which the dynamic forces of water, wind, erosion and deposition are to interact with one another. This led to temporal observations of how projected changes will affect the entire landscape image of the site in the long-term.

The future sustainability of the site was addressed at regional, local, as well as more detailed scales. The pivotal role of the Rhine Delta site as the termination of the Rhine Valley network ensures that landscape design decisions made at the local scale directly reflect the dynamics of the greater valley region.

In order to work with new topologies, the work of the studio was based on the principal of energy conservation. For both environmental and economic reasons, students were expected to incorporate the process of sedimentation that naturally occurs in the delta area.



Each student substantiated scenarios that made use of extracted materials in a variety of ways. In so doing, a fundamental dynamic was to be recognized that would contribute directly to the evolving nature of the site. Additional material could be brought in or taken out of the site, but the end results were to be sustainable.

Likewise, the addition of new systems or erasure and modification of existing landscape structures such as inlets, islands, new urban areas, fields and roads were to be justified and the process of sustainable implementation explained.

The design methodology used to induce a transformation in the identity of the Rhine Delta consists of four key elements:

- 1- Topography as a primary tectonic and structuring device and tool.
- 2- Water as a dynamic system of flows and forces at a

variety of scales.

3- Ecology as a sustainable model for diversity and equilibrium.

4- Dwelling as the mode of inhabiting such a landscape.

When applied to an understanding of the site and its prevailing structures over time, these elements generate a new contemporary landscape identity and aesthetic for the Rhine Delta specific to its dynamics and qualities.

#### Site Data

Site area: 3000 hectares

Shoreline length: 8 kilometers

#### Lake Constance

Lake Area: 536 square kilometers

Max depth: 254 meters

Content: 50 cubic kilometers

Mean annual flow: 11.5 cubic kilometers

Mean run-off at Constance: 365 cubic meters per second

Lake inflow varies from 33–3000 cubic meters per second

Lake run-off varies from 100–1000 cubic meters per second

Low lake level Jan 2007: 395.8 meters

High lake level May 1999: 397.8 meters

Typical low lake level Jan–March: 395.2 meters

Centennial high lake level: 398.0 meters

Polder dam level: 398.7 meters

Potential lake fluctuation: 2.5 meters

Bordering countries to Lake Constance: Switzerland, Austria, Germany

Lake Constance supplies the drinking water for 4 million people

Bordering countries to the Rhine:

Switzerland, Austria, Lichtenstein

Sedimentation: 2,5 million cubic meters per year



Lake level fluctuation  
Return to typical lake levels  
(September 07)