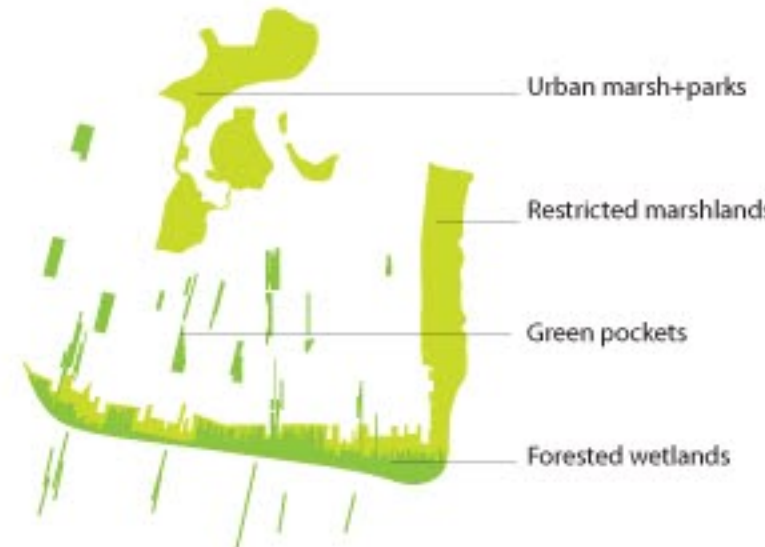


Fig.1 Map is showing the water line if sea level rises up to 1 m. and also the site location.

## Foundation of liquid city

### Landscape



# Liquid cities

## Salt ponds to living ponds

### The Dilemma

The global sea level is rising. As a result, a huge area along the shores of San Francisco bay will be covered by water. This happens while more than half of the marshlands of the bay have been replaced by landfills and new urban developments. Unlike the natural shore landscape, landfills are not flexible and cannot react to the changes in water levels. This incompatibility of the city infrastructure with the native environment threatens the existing shore cities. (Fig 1)

On the other hand, the population explosion of the bay cities, due to expansion of industries such as high-tech in Silicon Valley and the promise of a new high-speed transit system, will inevitably lead to further urban development.

### Liquid Cities

Water has always been neglected as part of the landscape, with potential that allows for human habitats to grow on, in, within and around it. So far, the conventional technique for development on the shore has been to replace wetlands with landfills. In fact, a lot of effort has gone into separating water and human habitat (Fig 2, 3). However, unlike marshlands, landfills are not flexible and cannot adapt to water fluctuations.

This project attempts to envision a new urban form. One that is capable of adapting to all kinds of water fluxes: short term changes (daily tides and seasonal floods) and long term (increasing sea levels). Unlike existing practices, Liquid Cities allow for constant interaction between land and water. Understanding the city as a site of "dynamic landscape forces" opens a gate to new opportunities in which water is not seen as a threat, but as an agent of change, and water level fluxes are potentials for envisioning dynamic urban habitats and cities which are in constant harmony with the forces of nature.

### Site

Redwood City salt ponds were chosen as the site for illustration of these new possibilities. Salt ponds will be replaced by a new landscape more in-tuned to the changes in water, while providing a foundation on which a Liquid City will take shape.

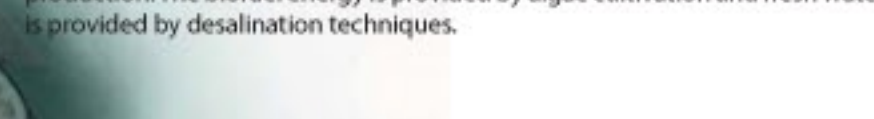
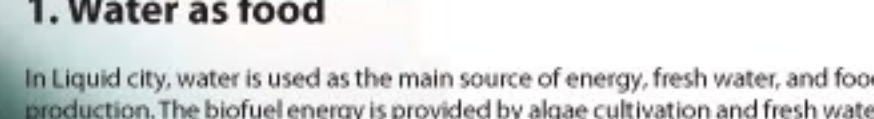
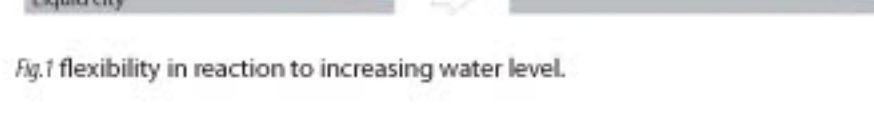
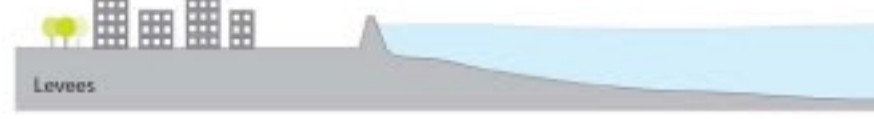
### Foundation

The foundation system of Liquid City allows water in-land, while simultaneously creating possibilities for controlling it. This possibility is provided by levees. These levees, equipped with water inlets in their walls, are specifically designed to control the water entering or draining off each pond. Through their varying composition, these levees control the distribution of water in the entire site. Through this system saline and fresh water can be stored in ponds during storm seasons to be used later for production or recreation purposes. Long term water fluctuations, such as rising sea levels, are accommodated by determining when and where ponds are filled with water.

Each levee, besides acting as foundation for urban developments, works as a giant utility box that is able to absorb, remediate, moderate, and collect the water, while, at the same time, serving as infrastructural elements for transportation of water and energy (Fig 4). These levees are also tools that enable designers to define new figure-ground relationships. Therefore, it does not only control water distribution, but also defines traffic and density flow.

The Liquid City, generated on this complex foundation, enjoys the following characteristics:

1. Water as food
2. Temporality and diversity
3. Expandability



### Levees

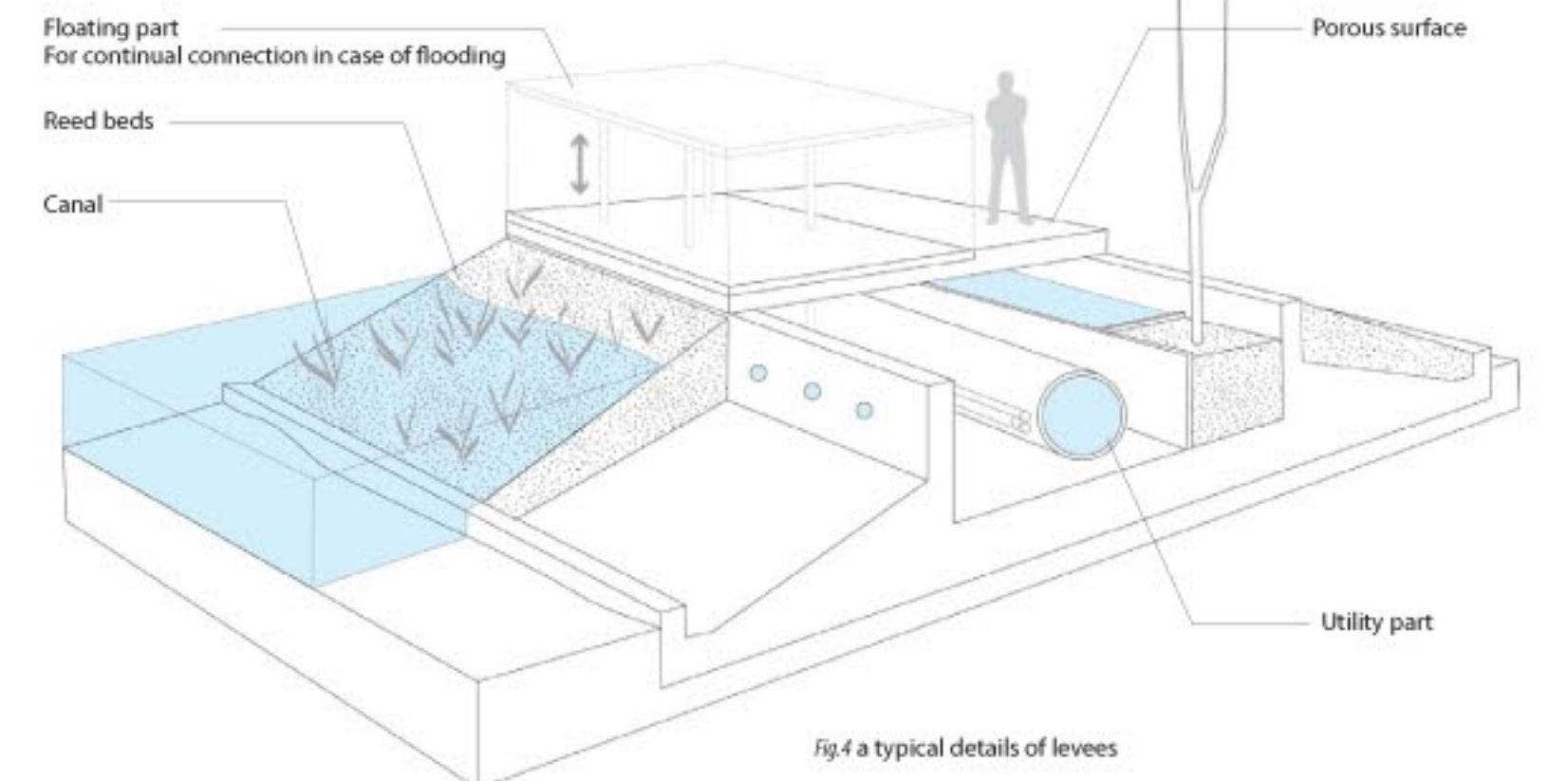
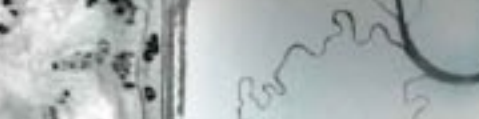
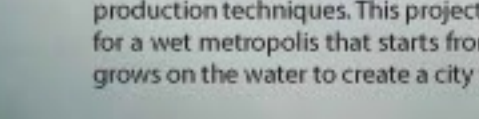
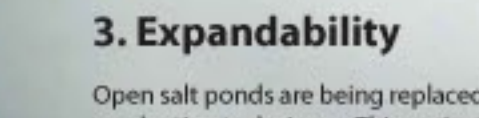
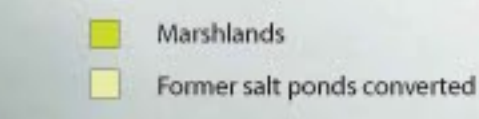
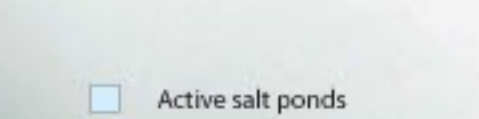
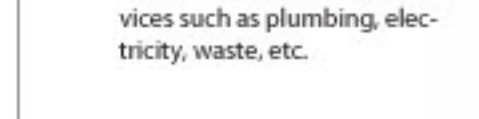
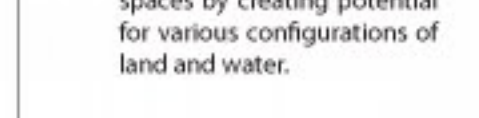
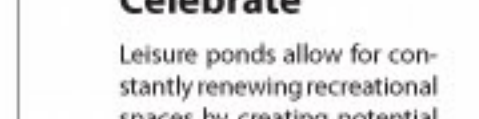
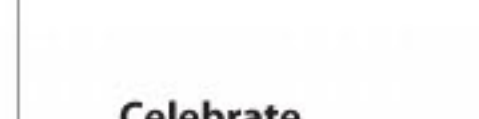
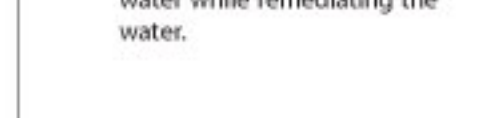
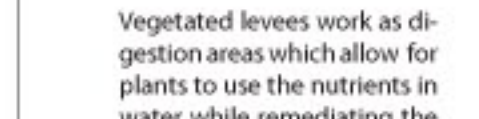
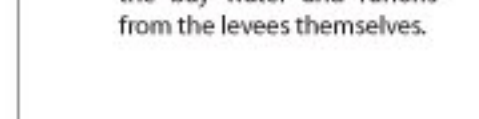
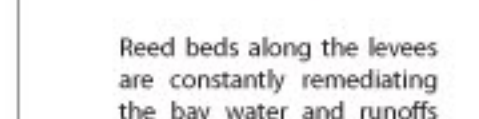
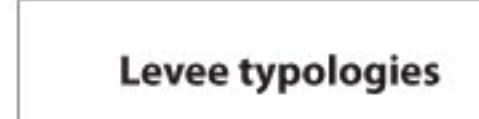
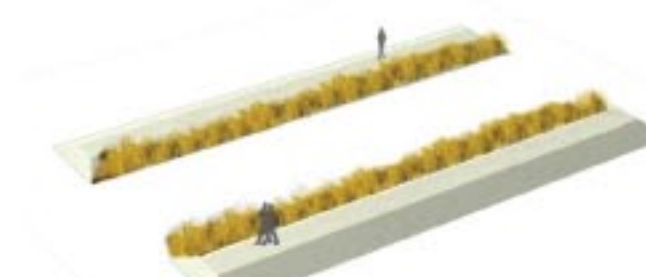


Fig.4 a typical details of levees

### Levee typologies

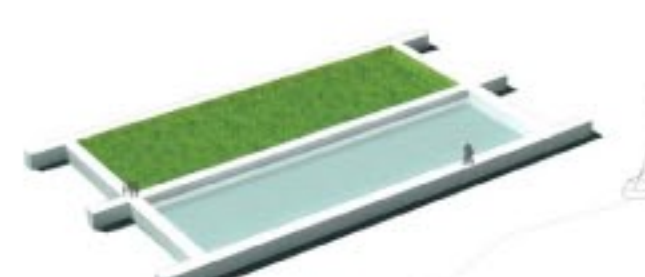
#### Remediate

Reed beds along the levees are constantly remediating the bay water and runoffs from the levees themselves.



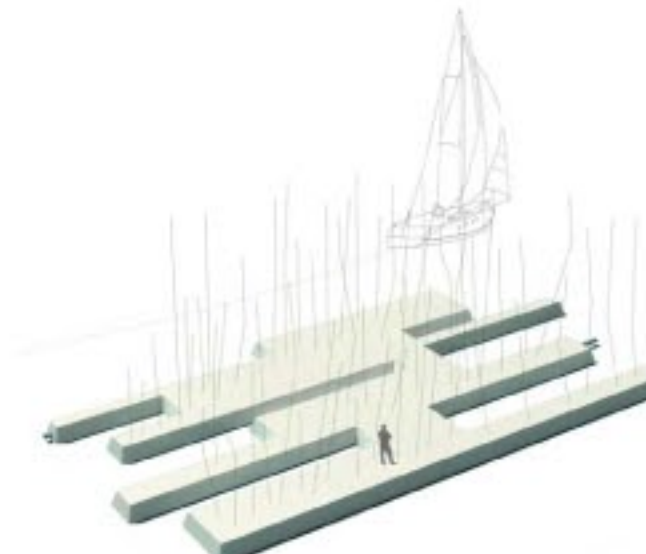
#### Produce

Closed ponds have the ability to store both salt and fresh water for production purposes such as aquatic farming.



#### Digest

Vegetated levees work as digestion areas which allow for plants to use the nutrients in water while remediating the water.



#### Store

Expandable storage tanks embedded in the levees have the ability to absorb and keep the excess water which is gradually discharged to green houses for algae cultivation purposes.



#### Celebrate

Leisure ponds allow for constantly renewing recreational spaces by creating potential for various configurations of land and water.



#### Collect

Some levees create ponds which collect storm water run-off coming from the entire site which is then used for a variety of purposes.



#### Support

Levees can act as infrastructural carriers of various services such as plumbing, electricity, waste, etc.



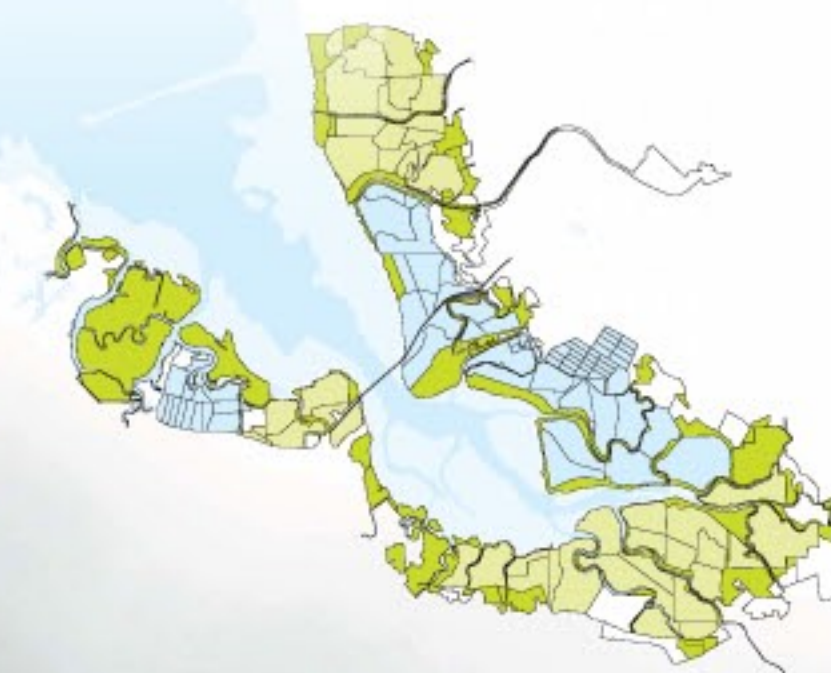
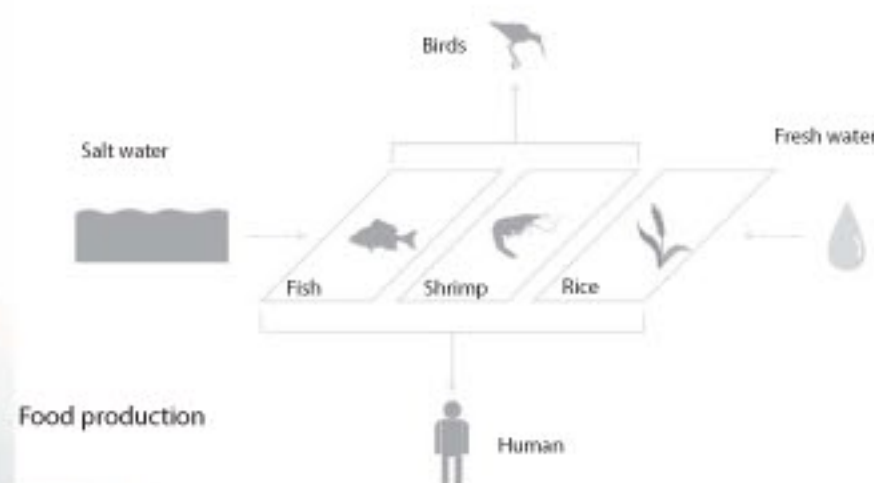
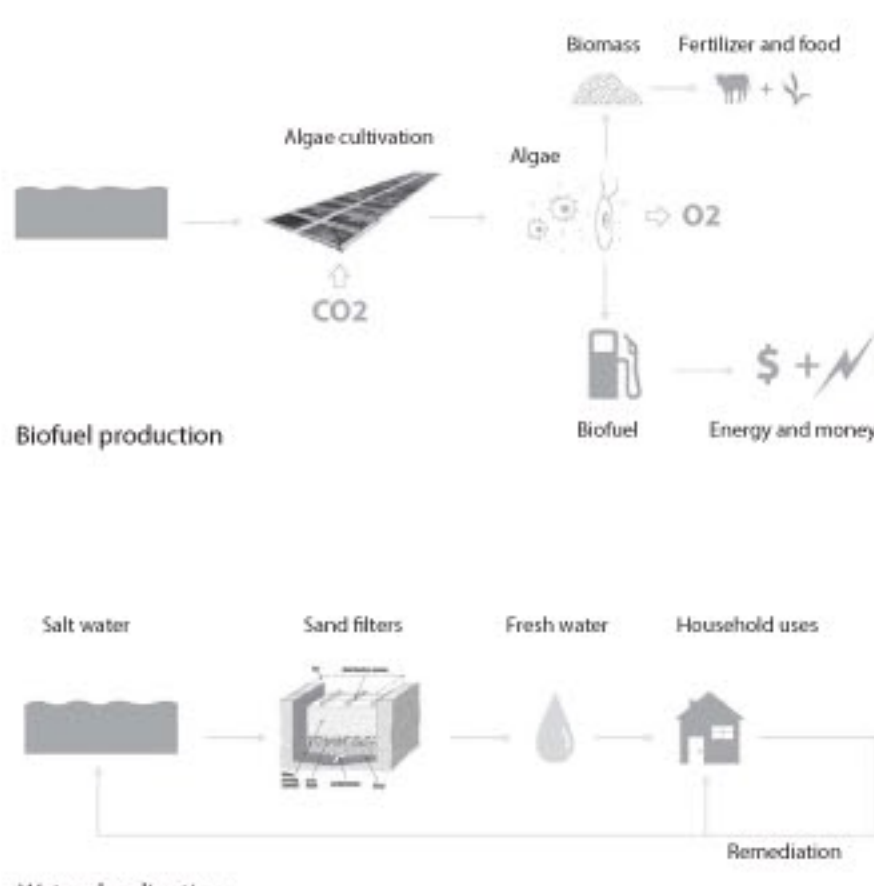
#### Moderate

Levees can moderate the flow and intensity of water, acting as wave breakers, allowing for docking and various water activities.



### 1. Water as food

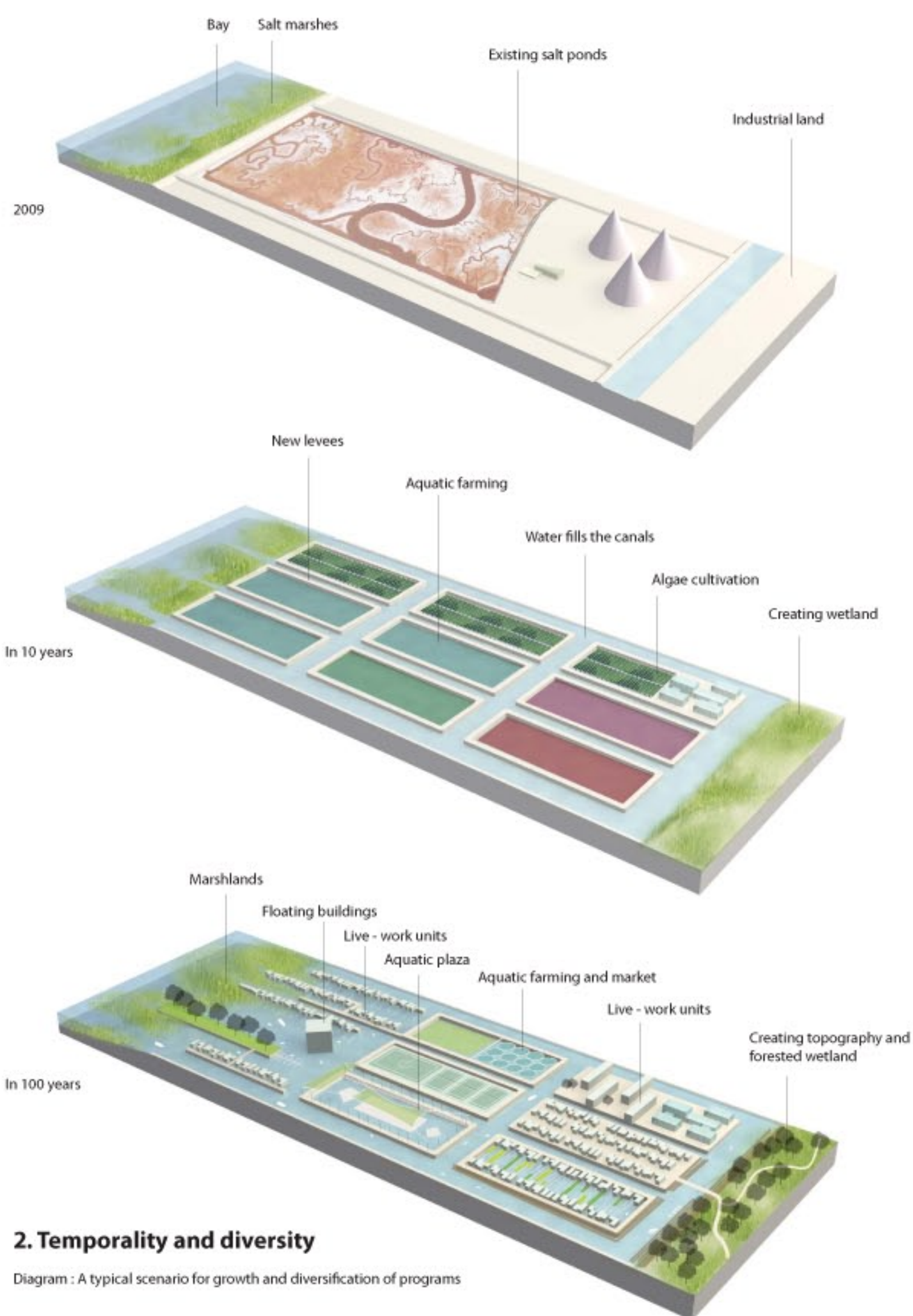
In Liquid city, water is used as the main source of energy, fresh water, and food production. The biofuel energy is provided by algae cultivation and fresh water is provided by desalination techniques.



- Active salt ponds
- Marshlands
- Former salt ponds converted to marshlands

### 3. Expandability

Open salt ponds are being replaced by faster and more efficient salt production techniques. This project proposes an alluring alternative for a wet metropolis that starts from shallow ponds of the bay and grows on the water to create a city that is liquid.



### 2. Temporality and diversity

Diagram: A typical scenario for growth and diversification of programs