John Todd Ecological Design

Baima Urban Canal Restorer

The Baima Canal with a Restorer system remediating contaminants out of the canal

Background & Design

Fuzhou is a city of 6 million people which has long emptied commercial wastewater and a portion of its sewage into and 80 kilometer network of canals. These canals run through the city before ultimately emptying into the Minjiang River. The polluted canals are a health risk for the city's inhabitants and threaten the livelihood of downstream fishing communities. A 600-meter canal named Baima was considered one of the worst in the city and had extreme problems with odor and floating solids created by the influx of 750,000 gallons per day of untreated domestic sewage. Rather than re-piping the polluted water to a remote wastewater treatment facility, the city government sought an affordable and low maintenance treatment system within the canal itself.

In 2002, John Todd Ecological Design collaborated with Ocean Arks International to design a Restorer for their Chinese partners on the Baima canal using 12,000 plants composed of 20 native species. Constructed with a walkway down the center, the Restorer has met water quality goals and created a prized recreation area for the members of the community.

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Treatment Process

The City of Fuzhou's wastewater issues are typical of many developing world cities. The odors from the Baima Canal in particular were a major issue for adjacent temples, an elementary school, and residential apartment buildings. A 500-meter linear Restorer was installed in the summer of 2002. The plant root zones and fabric media of the Restorer provide biophysically diverse surface areas necessary for effective biological treatment of wastewater.

Raw sewage entering into the canal

Wastewater entering the end of the canal is recycled to an upstream anoxic zone for treatment. A fine bubble aeration system distributes air along the canal from the blowers located on a central floating barge. Low intensity and uniformly distributed aeration circulates the water past biologically active zones. The Restorer continuously inoculates the canal with beneficial bacteria in two locations. Bacterial species were selected for their ability to aid in digestion of sludge, greases and nitrogen removal. The Restorer system successfully met the goals set by the City of Fuzhou, reducing odors, eliminating floating solids and drastically improving the aesthetics of the neighborhood. The technology reduced the negative impact of the pollutants in the canal on downstream aquatic habitat. The clarity within the canal increased from less than 6 inches to several feet while meeting several secondary effluent standards.

Residents enjoy the Restorer walkway

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