Levee Removal

At least in North America, humans have been building levees almost since colonization began. In a way they're part of an unending campaign to 'civilize' the land, smoothing out rough terrain, straightening and containing rivers, filling in wetlands. All of this has led to unforeseen consequences from erosion to centuries of drying out the continent.

Prior to levees, river landscapes were often messy, complex, and full of food for birds, fish and invertebrates. Where possible, they would spread and braid across a wide area, and their slow-moving, shallow channels formed sprawling wetlands full of native grasses and willows which provided critical resting and rearing sites for young salmon before they headed out to sea. These wide spaces could flood safely during storms, and they played an important role in slowing and cleaning floodwaters.

These shifting rivers and sprawling wetlands were generally inconvenient to farmers and other settler types, who prized floodplains for farmland and development. To protect their new territory from its routine flooding, they built thousands of miles of levees along nearly every major waterway, constraining their movement until some looked more like canals than natural rivers.

This was disastrous for the species which had evolved to occupy the niches now buried under levees and fill but it also hasn't worked out great for humanity. In a narrowed, straightened river, that surge of water has nowhere to go, and nothing to slow its movement. As climate change alters weather patterns, intensifying storms and worsening both droughts and floods, we've seen frequent levee failures as hundred- and thousand-year floods become routine events.

There's a self-defense truism that “the best defense is not to be there” which likely applies in this situation.

Levee removal recognizes that this modern configuration isn't working well for anyone, humans or the species we share our environment with, and seeks to restore rivers to something closer to their original configuration. This can be beneficial in two ways - it allows the river to safely spread into designated areas where it can slow during a flood, and it allows for the restoration of habitats where native species can return and flourish surprisingly quickly.

In this way levee removal is part of a wider rejection of modern human landscapes. Flood- and erosion-mitigation tactics like sponge cities), beaver dam analogs, and rough mounding all focus on restoring or simulating preexisting conditions, and on slowing the movement of water and catching it in place, allowing it to permeate the ground again. And because these are the habitats most native species evolved to find their niche in, it's no surprise that they often start to recover almost as soon as we nudge things back in this direction.

Making these changes is difficult though. It's not just farmland behind these levees - the sad truth is that there are many places where homes were built, families raised, memories made, that were never really suitable for development and we're going to have to reckon with that in the coming decades, whether we're in a solarpunk society or not. We're already seeing the beginnings in our present with insurance companies refusing to cover some areas and floodplain buyouts where government agencies purchase flood-prone land, moving or demolishing any structures, and returning them to open space to restore and conserve natural floodplain functions.

Some areas just make more sense as floodplains and wetlands, providing important habitats and giving the rivers room to safely spread and slow their movements than they do as eternally-imperiled

developments.

So what do levee removal projects look like?

These projects, their goals, and processes can be as varied as the habitats they seek to restore and the communities they seek to protect. Often they're native-led initiatives, sometimes they're done by broad coalitions involving town, county, state, or federal governments, and local environmentalists. The restoration of habitat for native species like salmon seems to be the most common driving goal.

Generally they involve using excavators, trucks, and other heavy equipment to reshape the land, digging out the levees and reconnecting any still-existent wetlands which were severed from the river. It may involve digging fill out of buried wetlands as well.

Often the levee is rebuilt further back from the river. This may be an opportunity to build a better, taller levee, though it appears that these recessed levees generally require less maintenance as the floods have room to slow and dissipate before reaching them.

Preparation for Levee Removal may involve removing any structures on the site. In our present this is often done via demolition, but there are two alternatives to demolition which may be a better fit for your solarpunk setting: deconstruction – the process of disassembling a building to salvage as many construction materials as possible, and house shifting, the work of physically moving a suitable structure rather than building new. Both processes currently take more time/labor and cost more money than demolition, but they have many fewer externalities. They reduce the amount of raw materials the society must extract from its environment and they reduce the amount of landfill space it requires.

Examples

There are many levee removal projects you can reference for specifics local to your setting, but I'd like to highlight a few examples below:

In this project the Stillaguamish Tribe restored 230 acres of farmland in Washington state to tidal marsh. They also built a new levee on the other side of the restored marsh, to protect neighboring farmland. This represents an ongoing effort to buy back their historic lands (along rivers) to restore crucial nurseries for young Chinook salmon. Over the past 15 years, the Stillaguamish Tribe has purchased 2,000 acres of land for fish and wildlife habitat.

Further inland, the Muckleshoot Tribe worked with King County to remove the Lones Levee. The removal is part of a broader effort towards Chinook salmon recovery and flood risk reduction on the Green River.

The state of California recently completed this public-private levee removal project, allowing tidal waters to flow across 3,400 acres of land for the first time in 100 years. This appears to be a mix of flood mitigation and environmental restoration - it provides improved flood protection for the greater Sacramento area by adding more than 40,000 acre-feet of additional flood storage capacity to the Yolo Bypass, but it also restores habitat for native species including salmon and the endangered Delta smelt, and food and habitat for migratory birds who frequently stop in this area.

Levee Removal is often a fraught subject, and this escalating feud between two neighboring

communities over a series of makeshift dirt levees they refer to as spoil banks seems to be a pretty solid example of that. As best as I can understand/summarize it, this appears to be an argument over who gets flooded, or whether the removal of the levees will actually cause worsened flooding. The levees separated the Vermillion river from neighboring wetlands. One community wanted to remove it, and had studies that showed removing the spoil banks could help drainage throughout the first community by lowering water levels on the Vermilion by almost 8 inches in a 2- to 10-year storm and that removing the spoil banks would have little impact on the overall water level in the Bayou Tortue Swamp during storms because of the massive size of the swampland. The second community disagreed and did their best to prevent any change until the first community purchased some of the land the levees were on and quietly removed them. This began a large legal battle which is still ongoing, escalating to criminal charges.