



A Variety Pack of Impacts

Now that science is predicting more severe rain and drought events, where does that leave us? Certainly not high and dry but somewhere else, adapting to a changing world. The erosion of stream banks and increased sediment volume can harm ecosystems through sedimentation and deposition of silt in unwanted areas, which could lead to a need for dredging, with its attendant economic impacts. The dredging of the Providence River in Rhode Island was a decades-long dispute that raised technological, economic and ecological questions. The environmental effects included fears of the re-suspension of discharged pollutants and toxic metals from a former massive jewelry industry in Providence, that had previously entered the river and upper Narragansett Bay in massive quantities (there was lax regulation at the time of their use).

Climate change comes in varied shapes and sizes:

- **Increased temperatures** lead to increased evaporation, reducing flows and concentrating pollutants, which can be harmful to both animal and plant life.
- **Reduced snowpack and a shorter snow season** in the typically snowy northern states. As winter snowpack declines, less water will be stored on the soil's surface as snow, which reduces peak stream flows when the snow melts in spring – put simply, the rivers will not swell with the melting of the snow. In addition, the economic impacts on the skiing and winter tourism industries have already been witnessed throughout New England.
- **Increase in the frequency of short-term (one- to three-month) droughts by late-century.** Rhode Island is fortunate to have ample supplies of water in many areas, but the burden of water management and allocation throughout the state will require adaptive methods, which means the willingness and ability to change our ways to adapt to droughts. In the early fall of 2010, previously approved and much needed economic development projects were put on hold in North Kingstown due to a lack of water for essential needs, such as firefighting. A major cause: over-watering of lawns during summer months. Now, we all like our lush green patch of lawns or public parks. Unfortunately, lawns were best suited to healthy growth in Great Britain where the annual rainfall guarantees continued greening and lush growth. Early colonists brought the idea with them and we have become a society of lawn lovers. There is nothing wrong with that. Green grass feels great on hot summer feet and is much more inviting than hot pavement. But we must consider drought-resistant varieties of grass, and water in a sensible fashion within municipal guidelines.
- **Increase in the frequency of extremely hot days.** These “dog days of summer” can cause an uptick in water demand, and increase the likelihood and severity of damaging rainstorms under both scenarios. Heat stroke and other heat-related impacts can also take a toll, especially among the sick, the elderly, and very young populations.
- **Increased risk of saltwater intrusion into coastal aquifers** due to rising sea levels. Much media attention has been given to monitoring arsenic levels in drinking water, but saltwater can poison any well just as severely. And once an aquifer is breached with saltwater infusion, it is ruined for good.
- **Sewers or sewage treatment systems can be strained by heavy rains**, resulting in overflows in those areas that don't have the capacity to treat both wastewater and runoff. Sure, we can celebrate a successful response to heavy wastewater demands, such as those in the Providence Metro area where the Narragansett Bay Commission built an enormous underground tunnel with huge holding tanks for combined sewer overflow, but RI taxpayers felt the bite for RI's most costly public works project in the state's history. Wouldn't it be better to consider how we might lower the flow during periods of increased precipitation?