

## **What's Happening to the Beaches?**

As the weather warms and our beaches officially open for business Memorial Day weekend, you may notice some changes to the shoreline at our lakefront parks. In the past few years, the Lake Michigan water level has risen from historic lows to higher than average levels. As a result, communities all along the Illinois Lake Michigan shoreline, including Highland Park, are experiencing beach erosion.

### **What is happening to lake level?**

The rise and fall of lake level is a normal process for the Great Lakes. Lake level varies daily, monthly, seasonally, and annually. Just five years ago, in the spring of 2013, Lake Michigan was experiencing close to record lows. Today, Lake Michigan water level is 23 inches above normal long-term monthly averages for this time of year.

### **Why is lake level rising now?**

There are many reasons for Great Lakes water level to rise. In Lake Michigan, a primary reason is the balance between evaporation and precipitation. Back-to-back cold winters in 2013 and 2014 contributed to the sudden increase in 2014. Ice cover blocked typical patterns of winter evaporation and then contributed to subsequent runoff from melting of snow and ice. Since then, the lake level in Lake Michigan has remained above average.

### **What are the forecasts?**

For this summer, the Army Corps of Engineers forecasts that lake level will follow its typical seasonal trends, but at a higher than average level. Even though the water level is high, it is nowhere near the record high of the 1980s. Observed lake level in March 2019 were about one foot below the maximum recorded level measured in 1986.

### **How do higher lake levels affect the shore?**

Even as we started 2018 with a higher water level than the previous year, April and November of 2018 brought higher than average precipitation, including storms that pounded our shoreline with offshore wave heights of 12 to 18 feet, on top of already an elevated water level. When lake level is high, waves can reach higher up onto the shore and potentially cause more beach erosion.

### **What does this mean for our beaches?**

The amount of sand loss experienced from a given storm varies based on the geology of the beach as well as the nature of shore protection. For example, Rosewood Beach may appear narrower this summer, but its breakwaters and coves were designed by the United States Army Corps of Engineers (USACE) to protect and repair the beach from the effects of high lake levels and extreme storms. If there were no breakwaters, the beach would be completely exposed to wave energy and vulnerable to enhanced erosion.

The USACE designed Rosewood in anticipation that there would be some sand loss while the beach settles in and takes its natural shape. That has been happening over the past few years, even as lake levels have risen. During storm events, the design allows sand that is pulled off the dry beach to settle in front of the breakwaters, migrating into and between the beach coves, where it provides future protection for the shore by breaking the energy of storm waves before they hit the beach. By design, once full, the breakwaters and coves allow additional sand to move down the shoreline.

Historical shoreline data indicates that most beaches recover from a high lake level once the water level recedes, according to Dr. Theuerkauf of the Illinois State Geological Survey (ISGS) at the University of Illinois at Urbana-Champaign. Theuerkauf notes that this recovery process may take several years of sustained lower lake levels. Predicting exactly when this will occur is extremely difficult given the complexity of the processes driving water level variations in Lake Michigan.

### **What is the Park District Doing?**

As the Park District works to provide safe and fun beach-going experiences through routine maintenance of our beaches, we also recognize that we are part of a dynamic and complicated lake ecosystem that requires us to have proactive and flexible plans in place to continue to protect our shoreline. That is why the District participates with other lake shore communities in the Sand Management Working Group, which partners scientists, local, state and federal agencies and the IDNR Coastal Management Program to better understand and find long term best practices for coastal issues.

### **What Else is Going On?**

Arising from the Sand Management Working Group and in conjunction with the Illinois State Geological Survey, a citizen-science program called COASTS (Citizens Observing and Surveying the Shoreline) has been developed which trains volunteers to collect beach erosion and accretion data at sites throughout Illinois. To learn more about COASTs:  
<https://publish.illinois.edu/lakemichigancoasts/>