



Frequently Asked Questions:

Alaska Beach Program Virtual Beach Model

What is Virtual Beach?

The Virtual Beach model is a predictive decision support tool developed by the EPA. This tool is used by several Beach monitoring programs across the United States. The tool uses local environmental data to predict bacteria levels at recreation beaches. This allows for beach managers to make informed decisions when issuing swimming and recreation advisories at local beaches.

Why use the Virtual Beach Model?

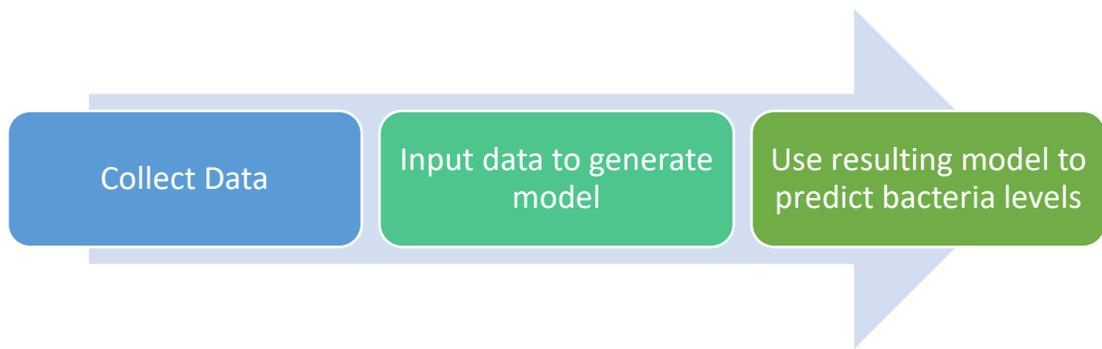
Some data like air temperature, wind speed, dew point is widely available online. Other data like water temperature is easy, quick, and inexpensive to collect. In contrast, bacteria data is relatively costly, and time consuming to collect and analyze.

We can use the Virtual Beach model tool to predict bacteria levels on local beaches by using the readily accessible environmental data without having to collect costly water samples each week. This saves time and money, but most importantly still protects the public by providing information on safe beach recreation practices in a timely manner.

How does the Virtual Beach model work?

- First, we collect environmental data along with bacteria samples. Environmental data might include air and water temperature, wind direction, wind speed, tidal height, etc. DEC is collecting environmental data with the bacteria samples over the summer of 2021.
- Next, we use the data collected to build the model. The Virtual Beach Model uses a statistical method called multiple linear regression. This method models the relationship between explanatory variables (environmental data) and a response variable (bacteria data) by fitting a linear equation to the observed data.
- Once we have the model built using local data, we can then use the resulting equation to predict what bacteria levels will be given a set of observed environmental conditions.
- Even when the model is completed, we will still periodically collect bacteria data to see if the model is working properly and make adjustments to ensure accurate predictions.

That's it! The model can seem intimidating, but you can think of it like how the weather service might make a weather prediction. They use easily measurable data (e.g., wind speed, air temp) to make a prediction of what the weather tomorrow might be. The Virtual Beach model does the same thing, but with bacteria.



How accurate is Virtual Beach?

Predictive modeling has performed well in multiple beach monitoring programs nationwide including Wisconsin (Great Lakes) and California. However, like the weather prediction on your local news station, the Beach Model might not always make a correct prediction. In the future once the model is calibrated for Alaska’s beaches, predicted bacteria levels will be labeled as “Predicted” in public notices and on the interactive mapping tools on the [Alaska Beach Program Webpage](#).

Where is Virtual Beach used in Alaska?

Virtual Beach is currently being pilot tested for use at the two recreational beaches at the mouth of the Kenai River (North and South Kenai beaches). We are also pilot testing Virtual Beach on Ketchikan area beaches.

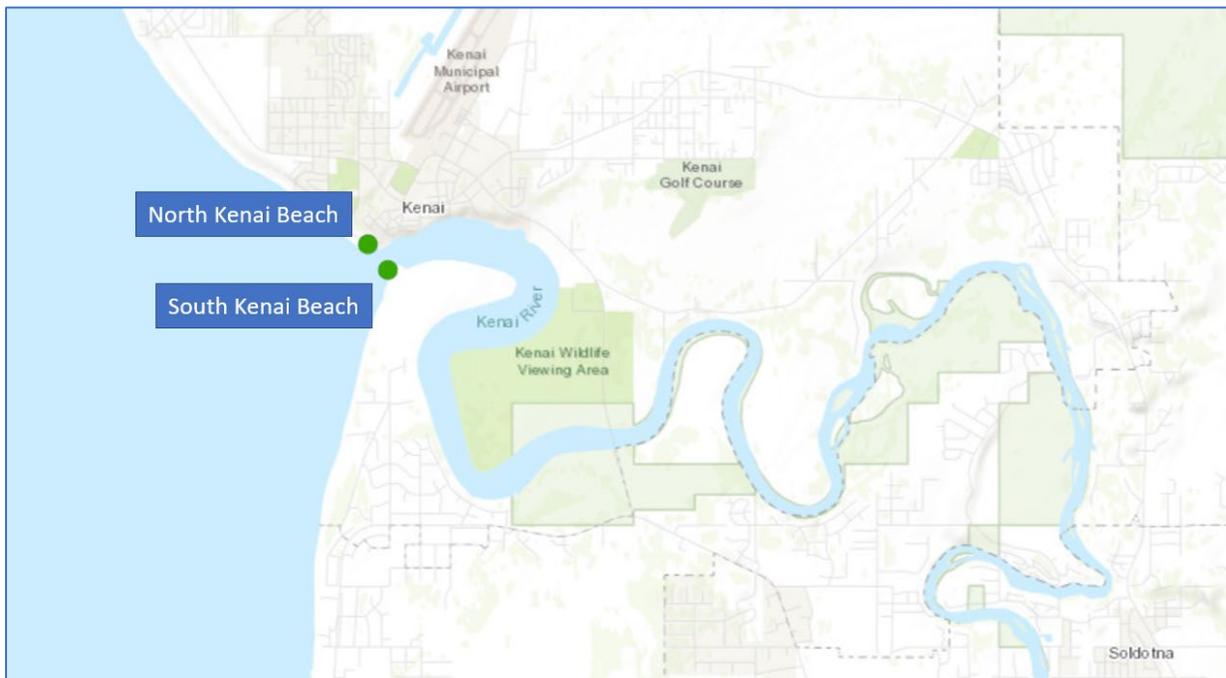


Figure 1. Kenai River Alaska Beach Program beaches



Figure 2. Ketchikan Alaska Beach Program beaches

Is DEC still collecting water samples at Alaska Beach Program beaches?

Yes, DEC will continue collecting water samples at Alaska Beach Program beaches. This will allow us to build the model using local data and then to check and see that model is working. We can also use the in-season bacteria data to update the model if needed. DEC plans to gradually reduce the number of sampling events over the next few years. For example, there are six bi-weekly monitoring events planned for 2021, and three for 2022 for Kenai River beaches.

Where can I learn more about beach monitoring in Alaska?

You can visit the [Alaska Beach Monitoring Webpage](#) to learn more about the Alaska Beach monitoring program. You can also visit the [EPA Virtual Beach Model](https://www.epa.gov/ceam/virtual-beach-vb) webpage (<https://www.epa.gov/ceam/virtual-beach-vb>) to learn more about the model.

Who can I contact if I have questions about Virtual Beach?

The Kenai Region contact for the Alaska Beach Program is Sarah Apsens ((907)741-1026; sarah.apsens@alaska.gov). For information on Ketchikan Beaches contact Gretchen Augat (907) 465-5023; Gretchen.augat@alaska.gov).