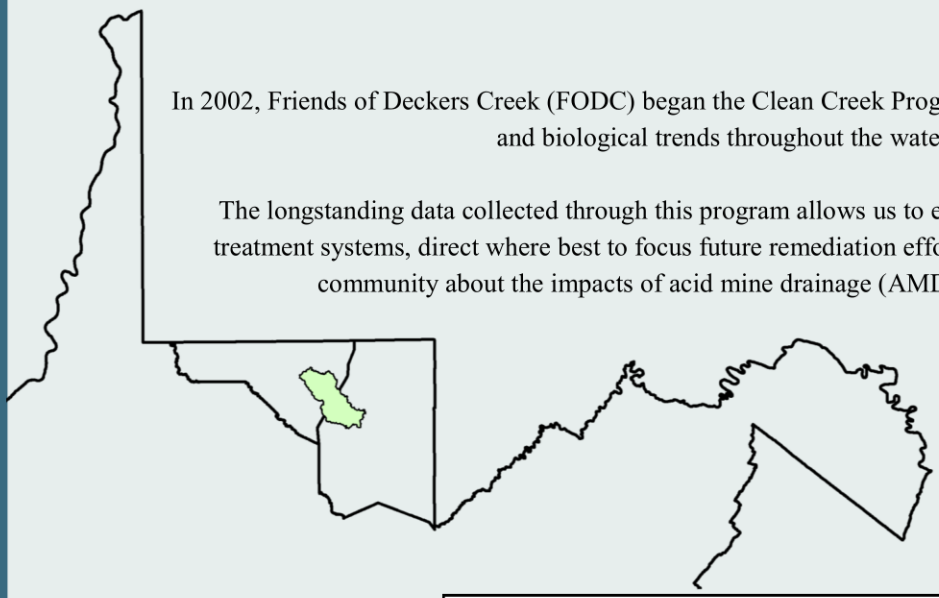
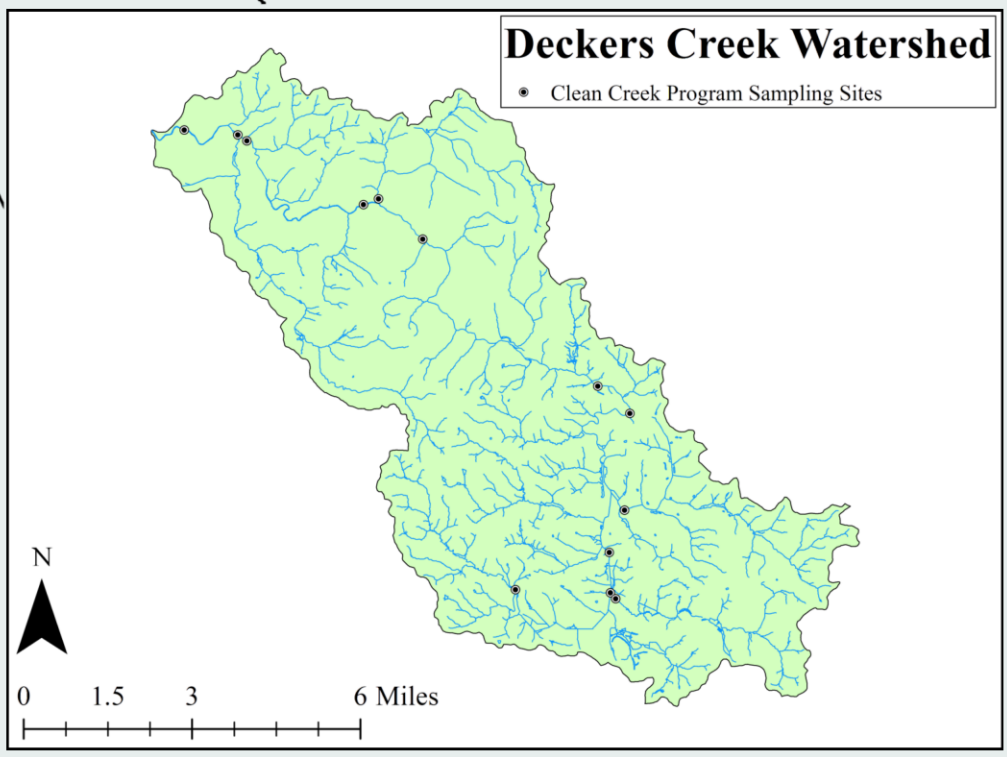
Friends of Deckers Creek

2014 State of the Creek Report

In 2002, Friends of Deckers Creek (FODC) began the Clean Creek Program to track long-term water quality and biological trends throughout the watershed.

The longstanding data collected through this program allows us to evaluate the success of our water treatment systems, direct where best to focus future remediation efforts, and inform the Morgantown community about the impacts of acid mine drainage (AMD) and other pollutants.





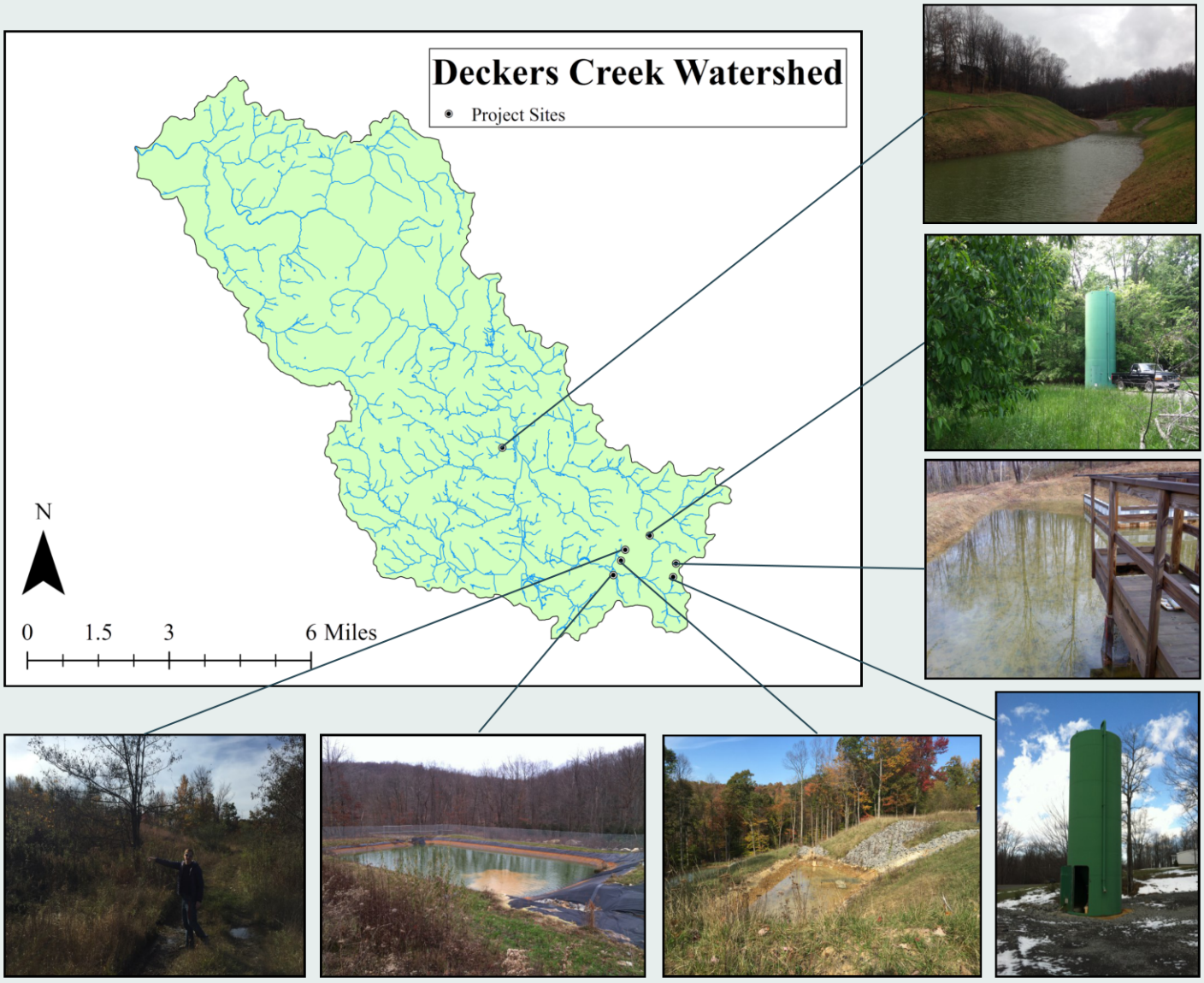
Over the past 13 years, FODC has monitored water quality quarterly and sampled fish and macroinvertebrate populations annually. Data is collected at 13 sites within the 64 square miles of the Deckers Creek watershed.

Acid Mine Drainage

Acid mine drainage (AMD), the largest pollutant in Deckers Creek, is a long-term byproduct of coal mining.

Pyrite (FeS_2), or fools gold, is found within coal beds and when it becomes exposed to water and air as a result of mining, it undergoes a chemical reaction called oxidation, becoming sulfuric acid and dissolved iron. The high acidity (low pH) of sulfuric acid further dissolves nearby, naturally-occurring metals such as iron, aluminum, and manganese.

The resulting contaminated water enters Deckers Creek, negatively impacting fish and other aquatic life.



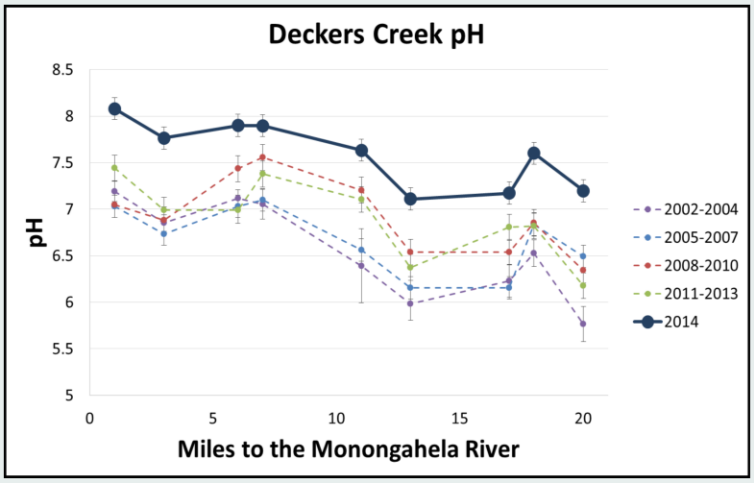
In 2007, FODC began receiving grants from the WV Department of Environmental Protection (WVDEP) to build AMD remediation projects within the watershed. Since that time, we have successfully installed 7 unique projects that target drainage from abandoned coal mines, allowing us to clean up the contaminated water before it enters our streams.

Thanks to these remediation projects, we have seen a drastic improvement in water quality, as well as abundance and diversity of fish and aquatic macroinvertebrate populations. This report illustrates the improvements that our projects have made over the years.

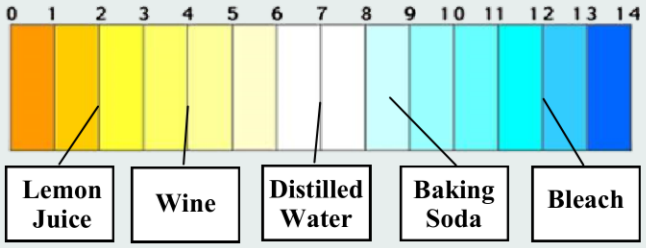
Water Quality

Abandoned mines in our watershed discharge low pH water that contains high concentrations of iron, aluminum, manganese, and other contaminants. By monitoring water quality quarterly, we are able to analyze and determine the concentration of AMD pollutants within the watershed.

The following graphs illustrate three important metrics we use to evaluate AMD in our waterways. Due to the high volume of data collected over the years, the graphs contain averages of three years ± 1 Standard Error with the exception of data collected in 2014 which stands alone.



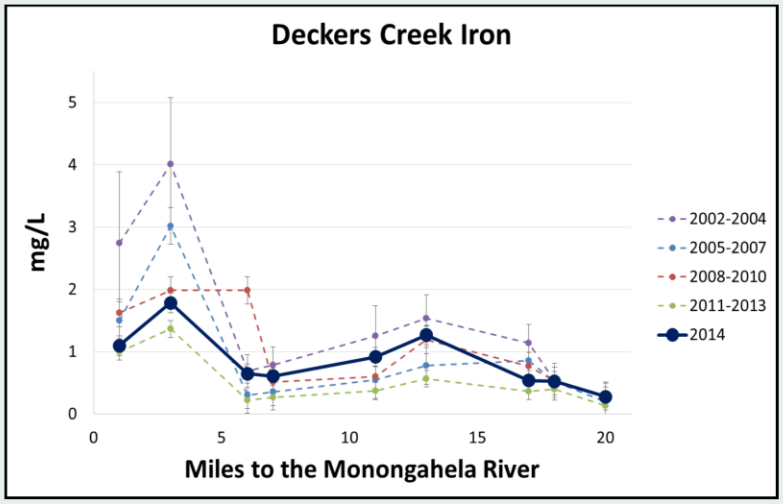
Low pH values indicate water that is highly acidic. If the pH is below 6, it may be too acidic to support aquatic life. Water discharging from many abandoned mines in our watershed contain a pH below 2. That is equivalent to the pH of lemon juice entering the water.

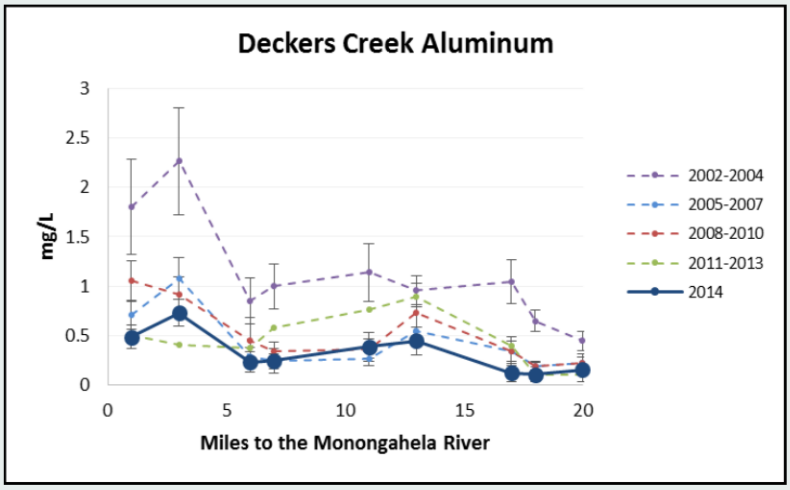


Iron concentrations above 1.5 mg/L do not meet water quality standards set by the WVDEP.

Spikes in iron concentrations are a result of abandoned mines discharging contaminated water into Deckers Creek, causing orange discoloration within the streambed.

The largest source of pollution within the Deckers Creek watershed is the Richard Mine. This abandoned mine discharges into Deckers Creek five miles from the Monongahela River.





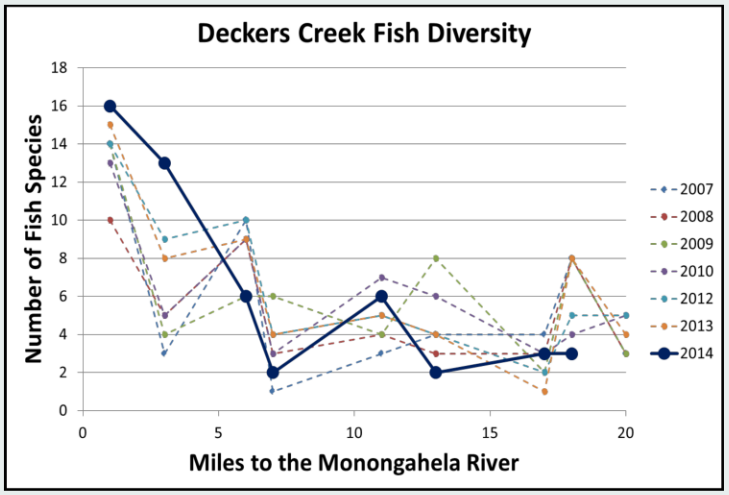
Aluminum concentrations above 0.75 mg/L do not meet water quality standards. Much like iron, large spikes correspond with the discharge of contaminated water into Deckers Creek from abandoned mines.

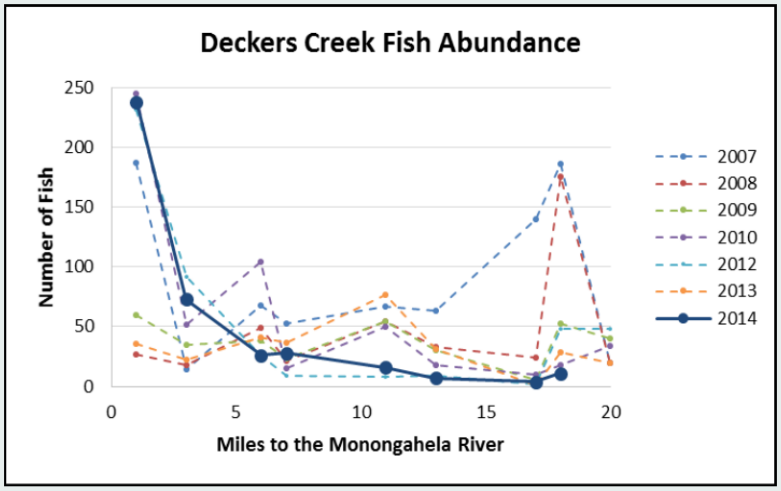
Unlike iron, however, aluminum will dye the streambed white instead of orange. Within our watershed, we see the largest increase in aluminum where the Richard Mine enters the stream.

Fish

Healthy streams are able to support a high abundance and diversity of fish. High abundance of native fish is a good indicator of high quality water and in-stream habitat. As the water quality around us improves, the amount of fish that are able to survive and reproduce increases. Conversely, polluted waterways, particularly those streams or rivers that are polluted with AMD will not support healthy fish populations. In order to track fish populations trends within Deckers Creek, we monitor fish throughout our watershed annually.

We find the highest amount of fish diversity and abundance the closer Deckers Creek is to the Monongahela River. Many fish swim up Deckers Creek from the Monongahela River but cannot swim past the Richard Mine due to the high volume of AMD it is discharging.



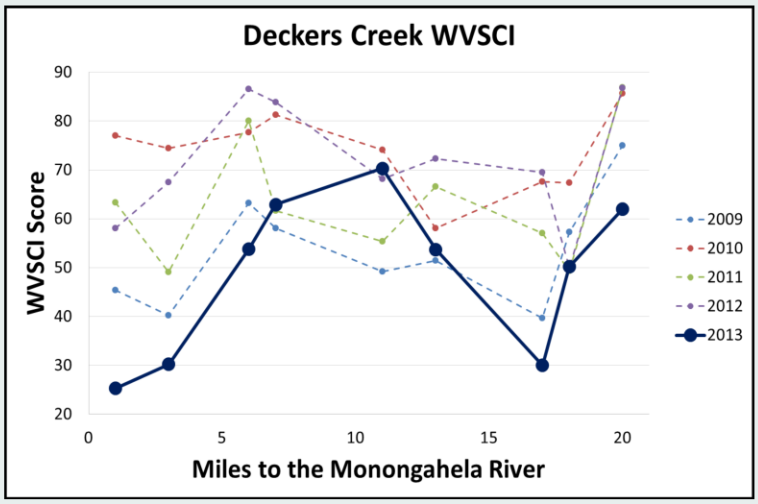


Working with the local Trout Unlimited branch, Brown Trout are stocked throughout the gorge along route 7 and in the upper watershed of Deckers Creek.

Aquatic Macroinvertebrates

Aquatic macroinvertebrates, or water insects, are excellent indicators of water quality. Because these insects respond to a variety of environmental factors, sampling those living within our streams allow us to better understand the health of Deckers Creek.

We sample macroinvertebrates throughout our watershed once a year, and unfortunately, this only gives us a snapshot of the macroinvertebrate communities at one moment in time. As a result, low values in the following graphs do not necessarily indicate poor quality water; instead, we analyze trends that occur over multiple years.

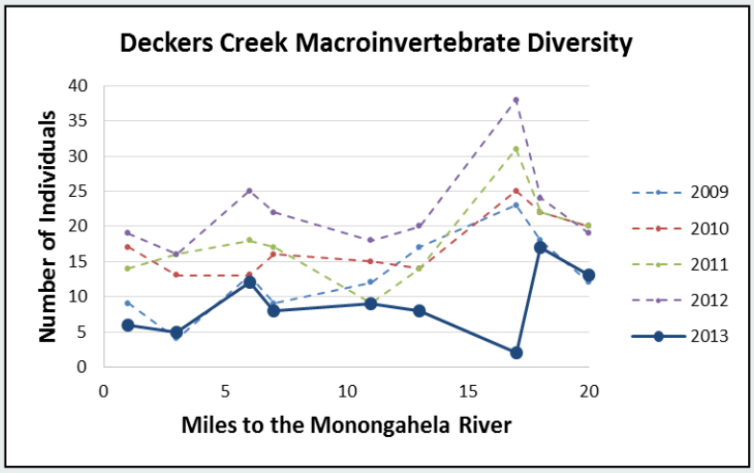


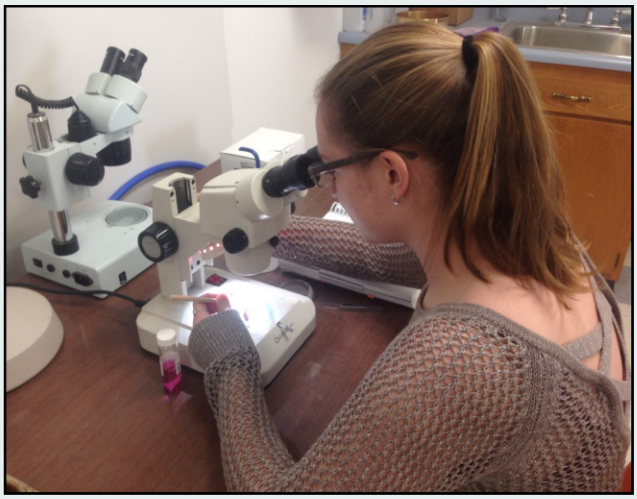
Macroinvertebrates are collected and analyzed using the West Virginia Stream Condition Index (WVSCI), a protocol developed by the state to determine the quality of a stream based on a score of 0-100.

> 85	85-70	69.9-55	< 55
Excellent	Good	Marginal	Poor

We generally find higher macroinvertebrate diversity within the headwaters. This trend is a result of a variety of factors, including the following:

- Forested headwaters produce more food resources for aquatic insects
- Reaches contain higher habitat quality and complexity
- Less urban development in Preston County headwaters limit the impacts of human influence





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Thank you for Making this Program Possible!

The Clean Creek Program was largely funded by the West Virginia Department of Environmental Protection.

Additional funding was provided by Stream Partners, the Morgantown Utility Board, MedExpress, the United Brotherhood of Carpenters Local 604, Allan N. Karlin and Associates, Dave and Marilee Hall, Don and Susan Sauter, Karl and Patty Diefenbach, and Ann Payne.

West Virginia University fisheries students, volunteers, and board members helped with fish sampling, Montgomery County Community College students helped with macroinvertebrate sampling, and numerous volunteers helped with water quality sampling.

This program would not be possible without the help of various local organizations and community members throughout the years.