

# The Shrinking Aral Sea

## Practical equipment:

- A4 Printed copies of satellite images of Aral Sea (15 images total)
- A4 transparency printed with 5mm grid squares (15 copies)
- Equipment for producing a graph e.g. graph paper and pencil, laptop, tablet etc.
- The photographic sequence should ideally be printed on separate sheets. It is important that the pictures are the same size

*This student activity has been adapted for the STEM training workshop. It contains the contextual introduction provided for students followed by workshop suggestions for teachers. There are also links at the end of the activity sheets that might be helpful should you wish to develop a similar activity based on Vietnam or another region of the world.*

## Context

The Aral Sea was once the fourth largest lake in the world. In the 1960s the Soviet Union diverted the main rivers that flowed into the lake in order to irrigate the plains to farm cotton and other crops. These farms produce goods that bring money into the area and provide employment to the locals.

However, the lake began to shrink as the amount of water entering the lake reduced. Villages that had previously survived on fishing suddenly found themselves miles away from the shore. Due to the evaporation of the water, the lake became increasingly salty killing most of the animals and fish. The dust from the dry lake bed was polluted with agricultural chemicals and caused serious health problems in people that lived nearby.

More recently, heavy rains briefly refilled part of the lake but the overall level has continued to decline. Various strategies have been tried to restore some of the lake area but progress has been slow.

1. In what year did heavy rain refill part of the lake?

2. If the lake continues to shrink at its current rate, in what year will it disappear entirely?

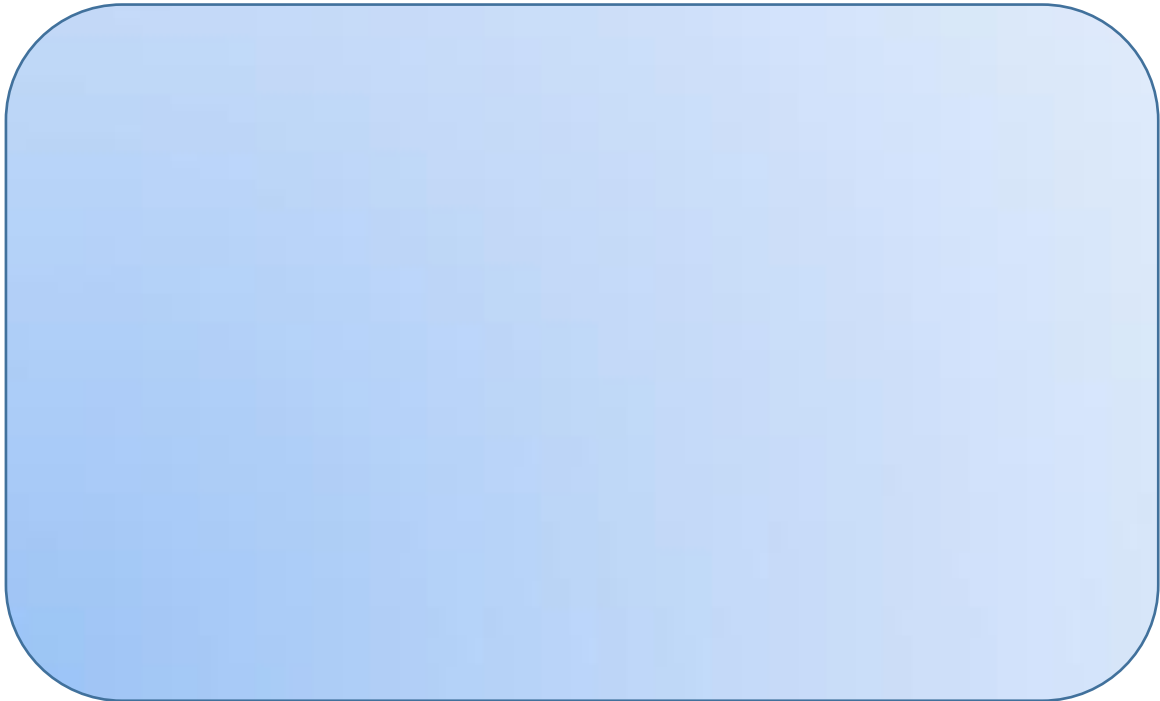
3. Do you think this will happen? Explain your reasoning.

There are many ideas to solve the problem with the lake. In one solution, the government plans to reduce the amount of water being used for irrigation to allow more to enter the lake.

A cotton farmer who works on the plains nearby says: **“The water level in the lake is dropping, but I need to use the water to grow my crops.”**

A fisherman from a village that used to be on the edge of the lake says: **“Without water in the lake I cannot fish and my family will starve.”**

Use information from the text, data from your graph and your own knowledge to explain the viewpoints of both people and draw a conclusion deciding if the amount of water used for irrigation should be reduced.



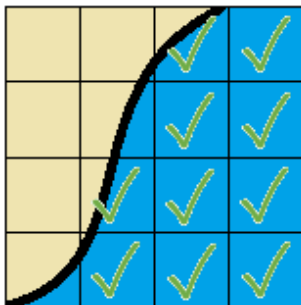
### Teachers Notes

- Show the animation of the shrinking lake.  
<https://imgflip.com/gif/131tup>

Ask the class:

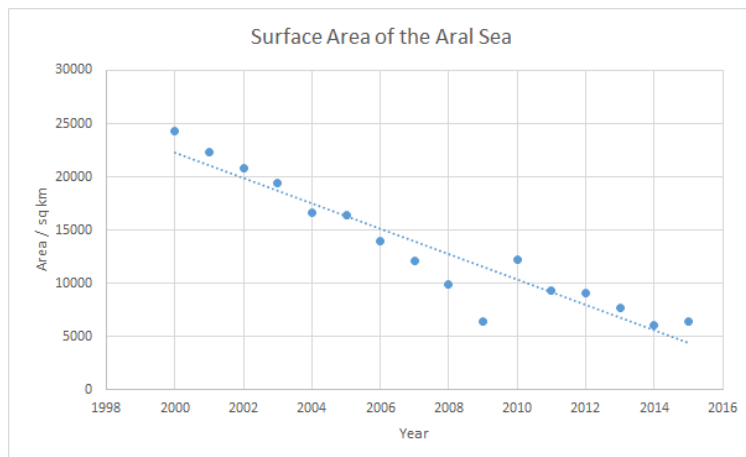
*“We have lots of data to collect here, if you all collect all the data from each map it will take a long time! How could we make this data collection process quicker?”*

- Hand out the printed images of the lake. There are 15 images, so split them as evenly as possible amongst the group. Hand out the printed transparency sheet, one per group.



- Review the image of how to count squares.
- Count each square that is 50% or more covered by the lake.
- Once you have made your measurement, ask someone else in your group to make the same measurement. If your answers do not agree, discuss why this is the case and try to resolve the problem.
- Share the data

- Produce a graph of lake area against year for 2000 – 2015 and draw a straight line of best fit through the data.
- Discuss your results and answer the prompt questions at the start of the activity



Answers to student questions:

2. 2010

3. Around 2018

4. Yes, because extending the line of best fit on the graph shows that area of the lake reaching 0 km<sup>2</sup> in 2018. Farmers need the water to irrigate their crops.

No, because there might be a change in water usage between now and 2018. Farmers may use more efficient methods for growing and irrigating their crops.

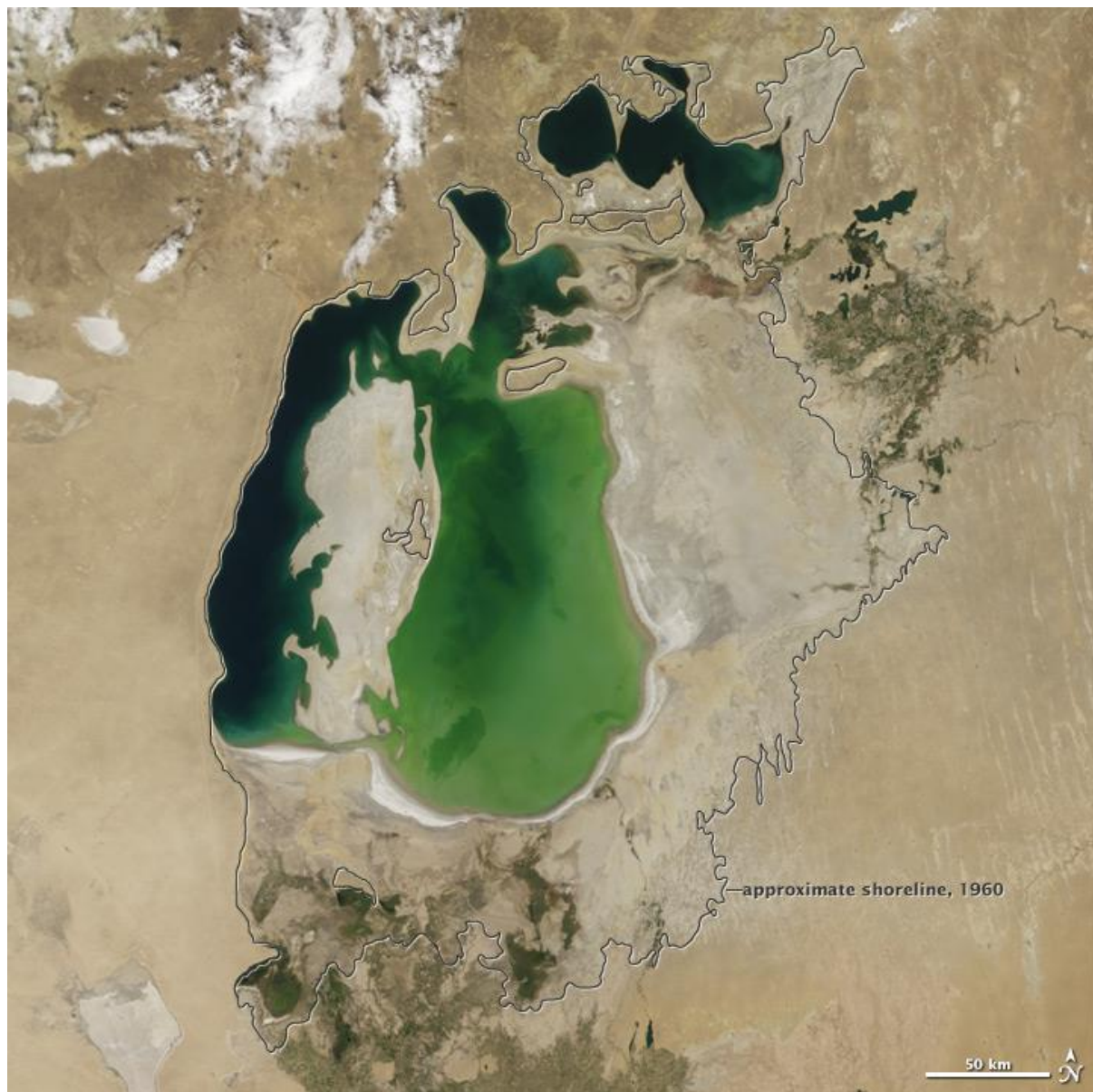
### ***Consider Water as a theme for the Vietnam STEM Programme***

***Look at Wateraid links to Vietnam. Sear for Wateraid Australia and then search for Vietnam***

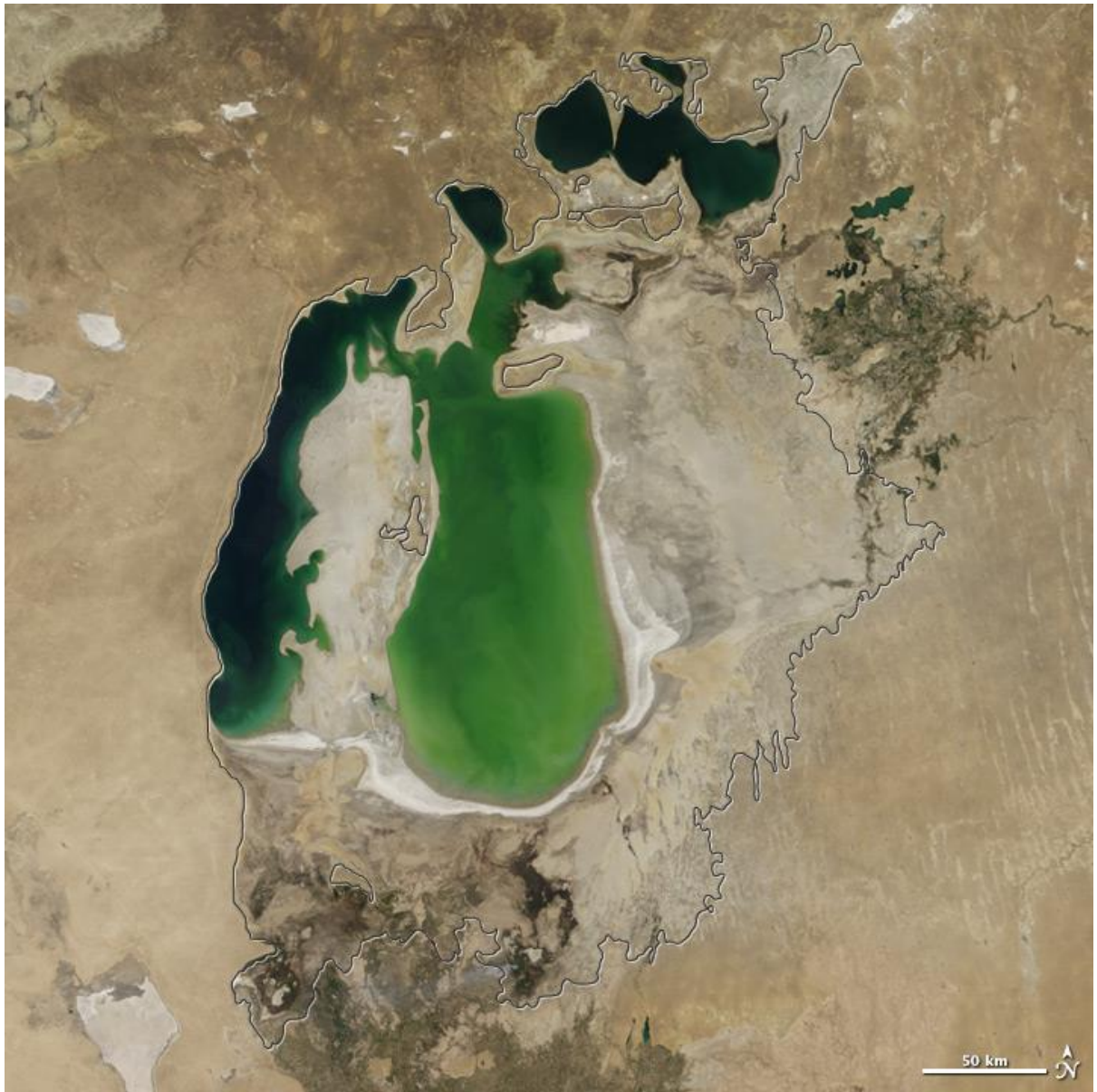
***These sources might also help you think about other projects using satellite imagery***

[http://earthobservatory.nasa.gov/Features/WorldOfChange/aral\\_sea.php?all=y](http://earthobservatory.nasa.gov/Features/WorldOfChange/aral_sea.php?all=y)

<http://earthobservatory.nasa.gov/Features/WorldOfChange/index.php>

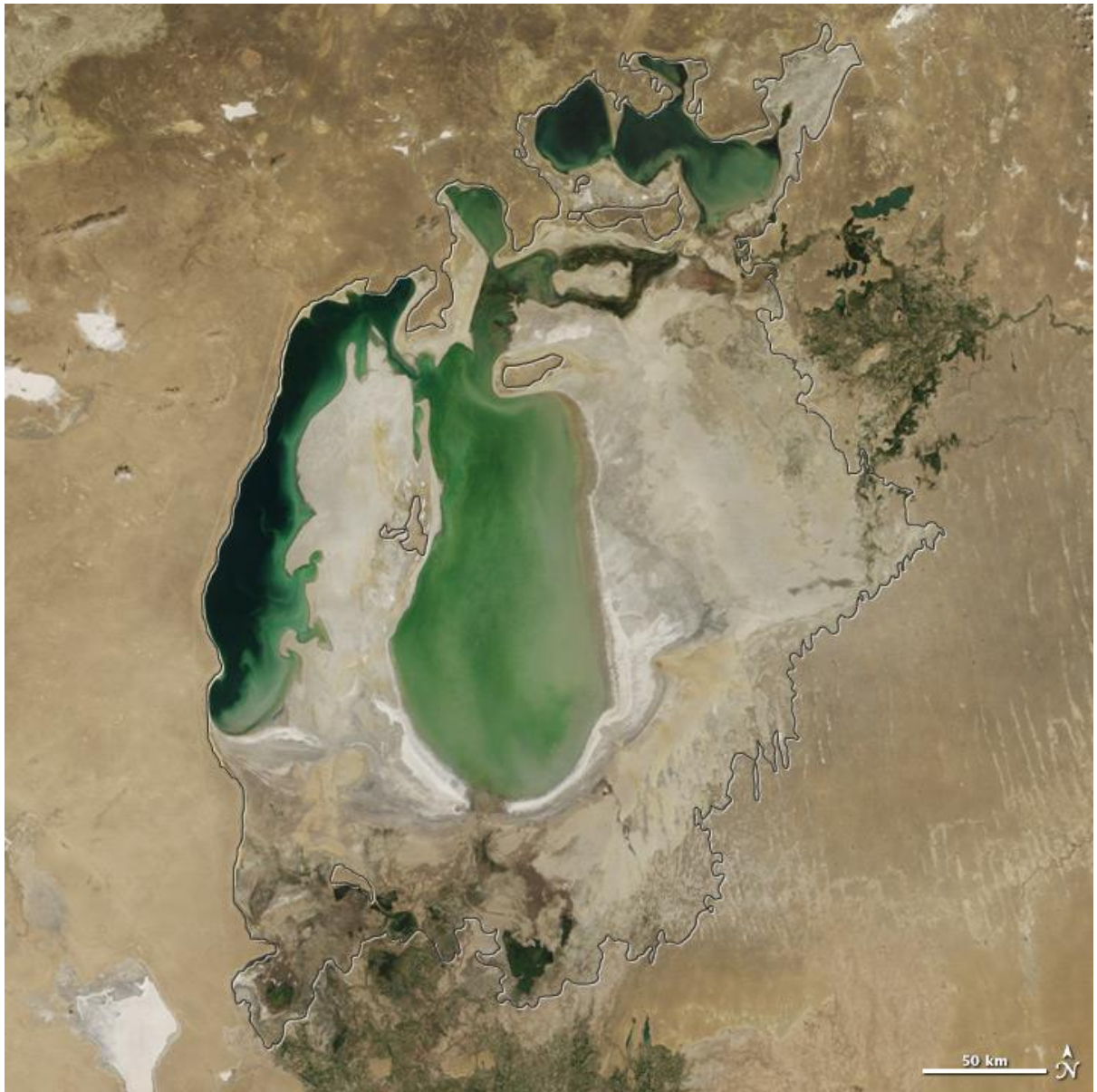


2000



2001



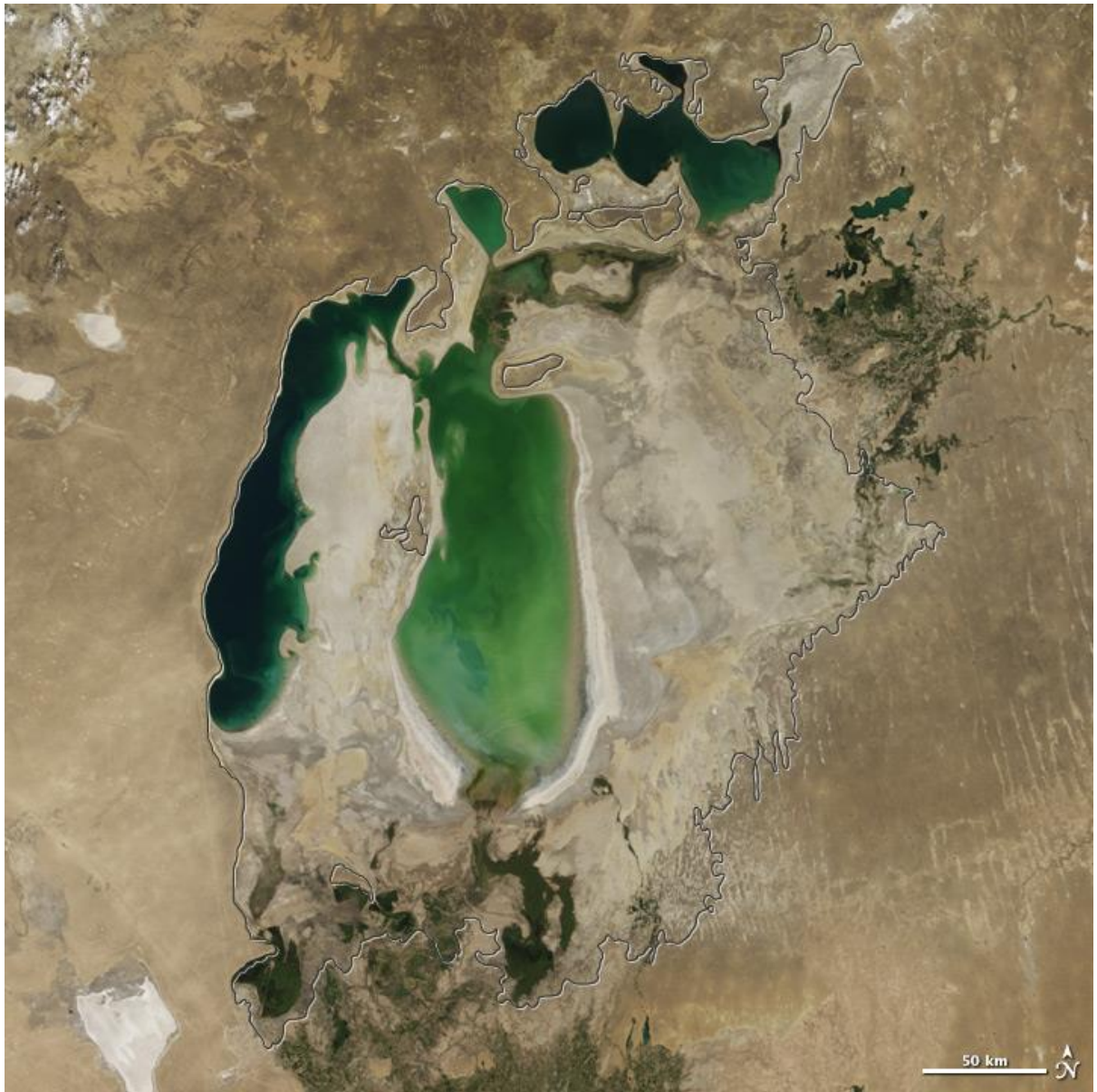


2002



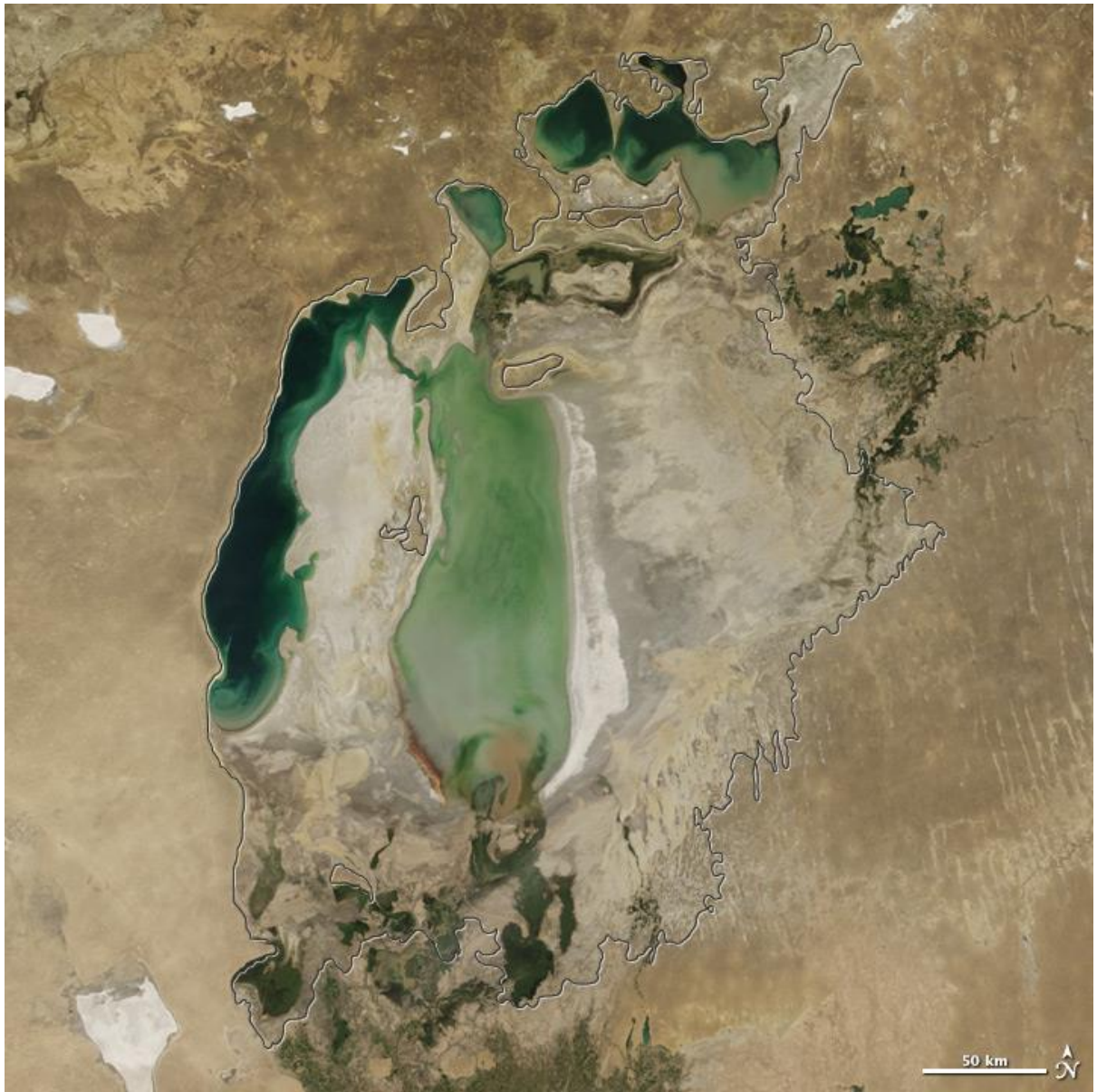
2003



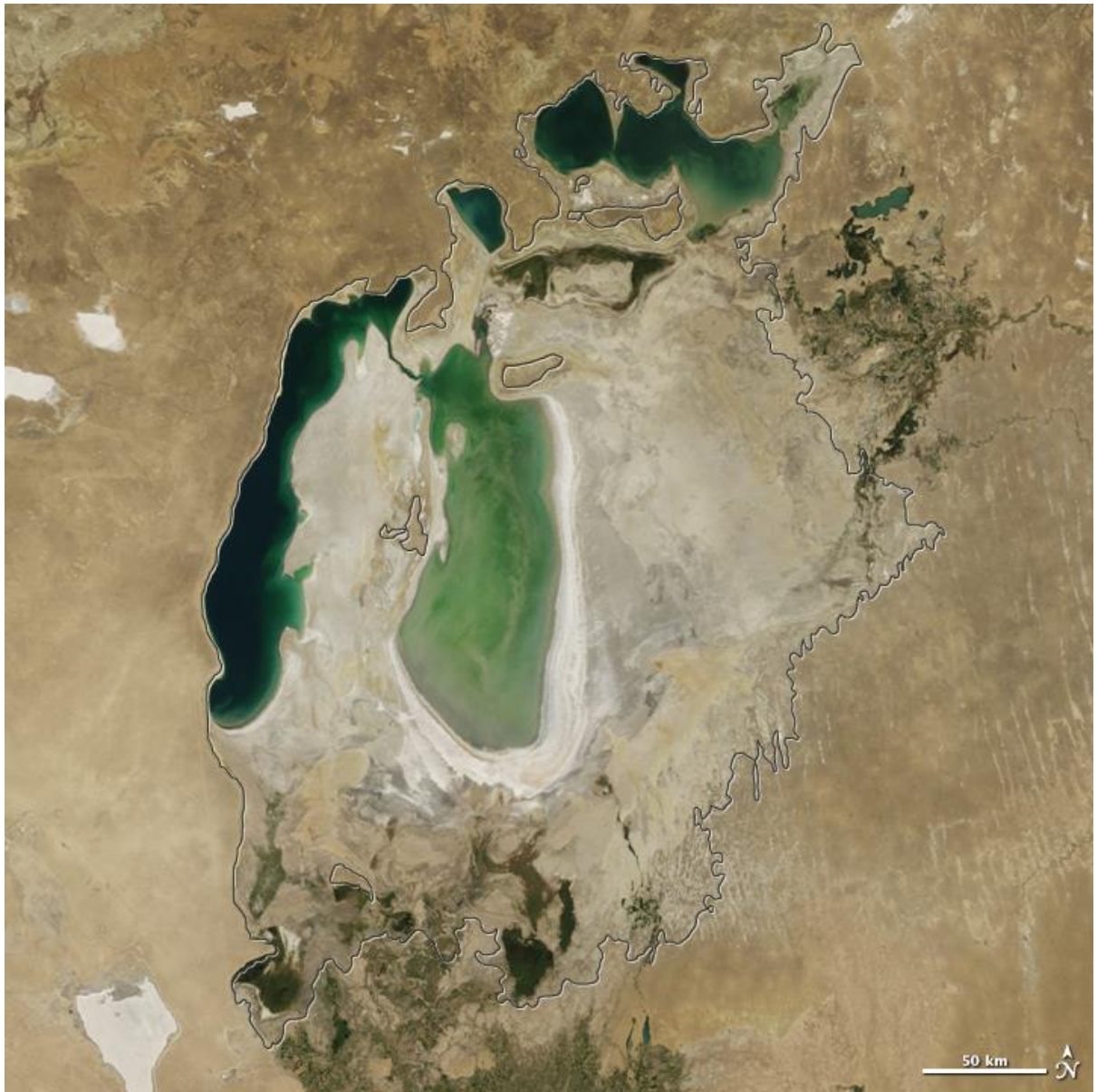


2004



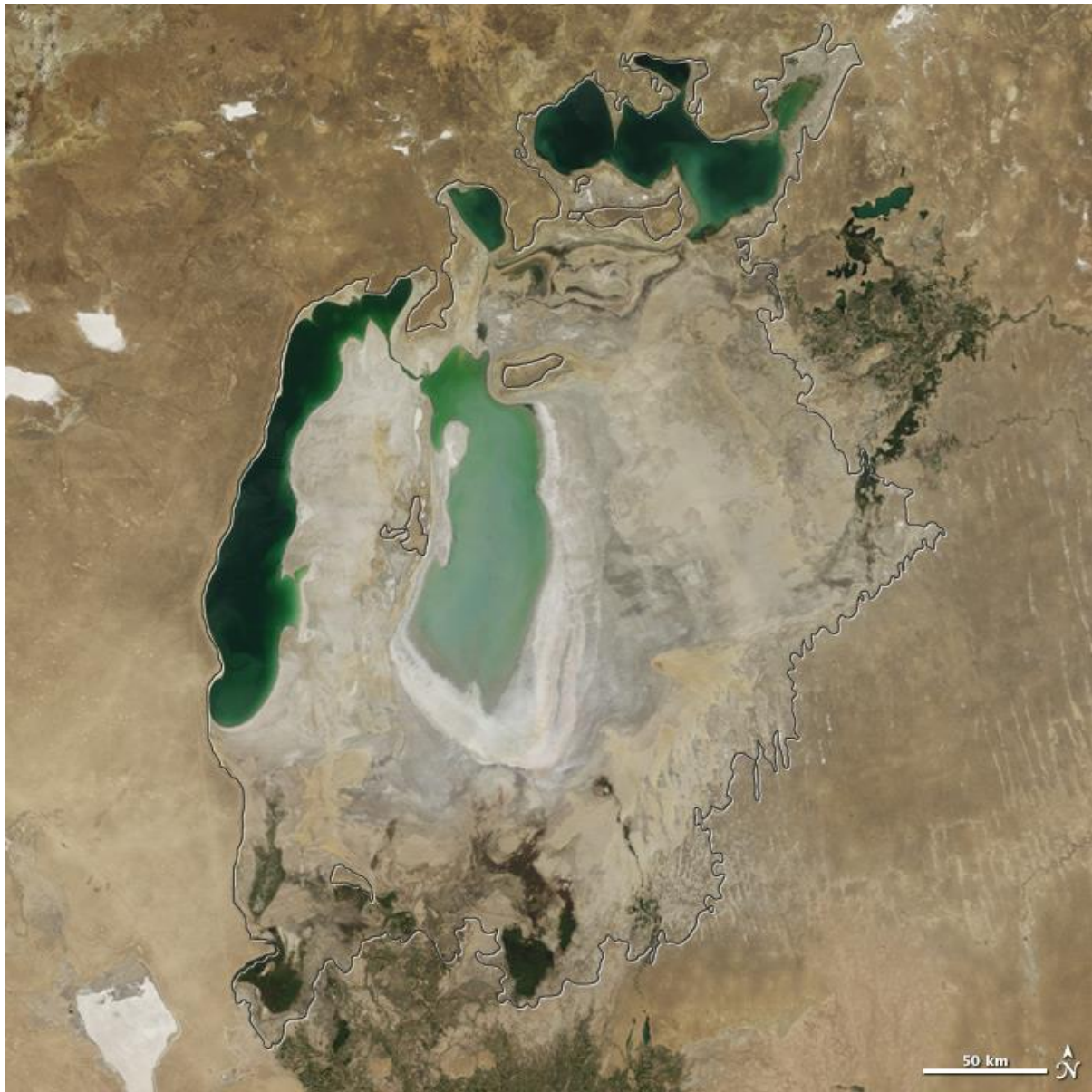


2005

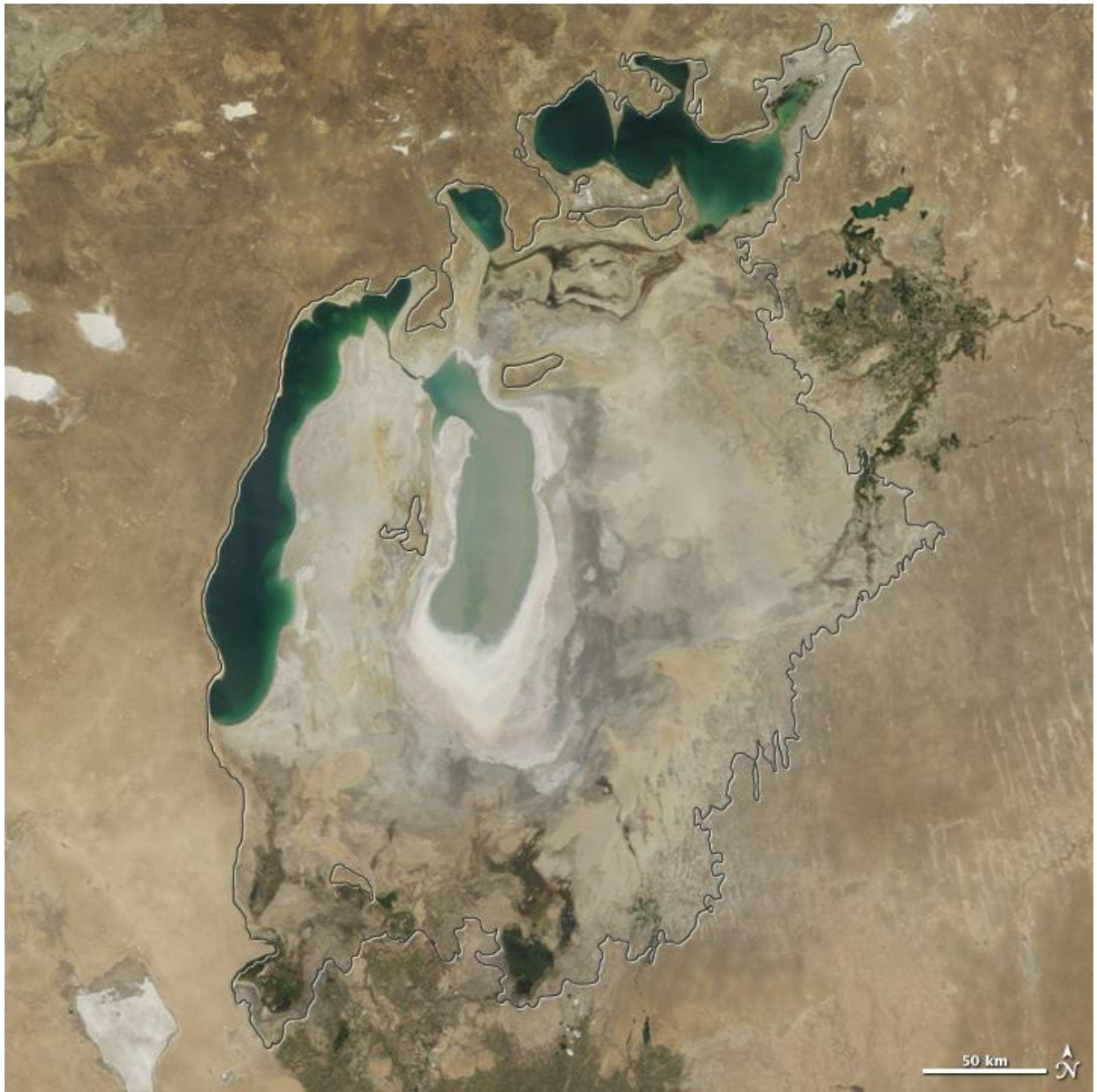


2006



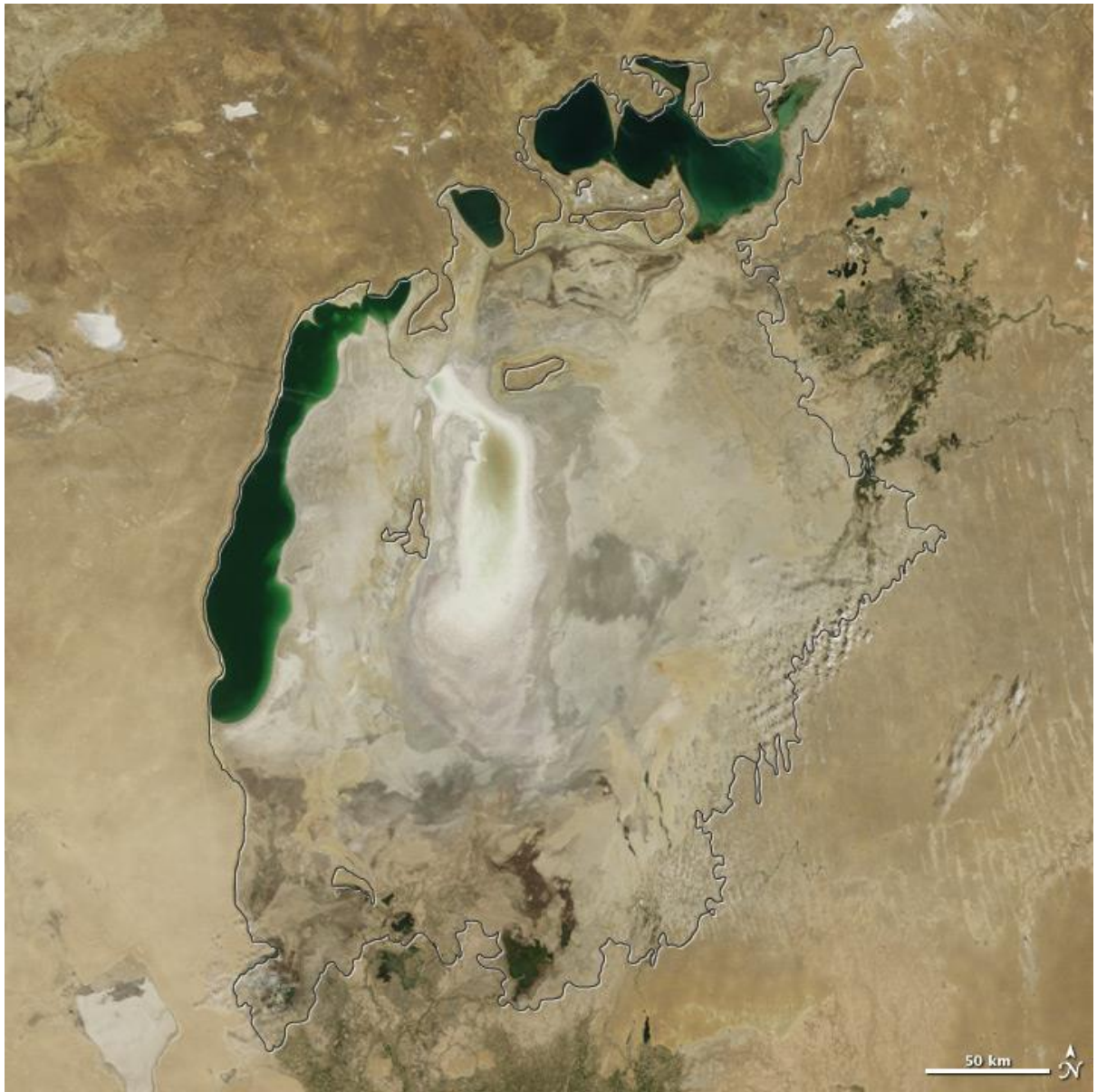


2007



2008



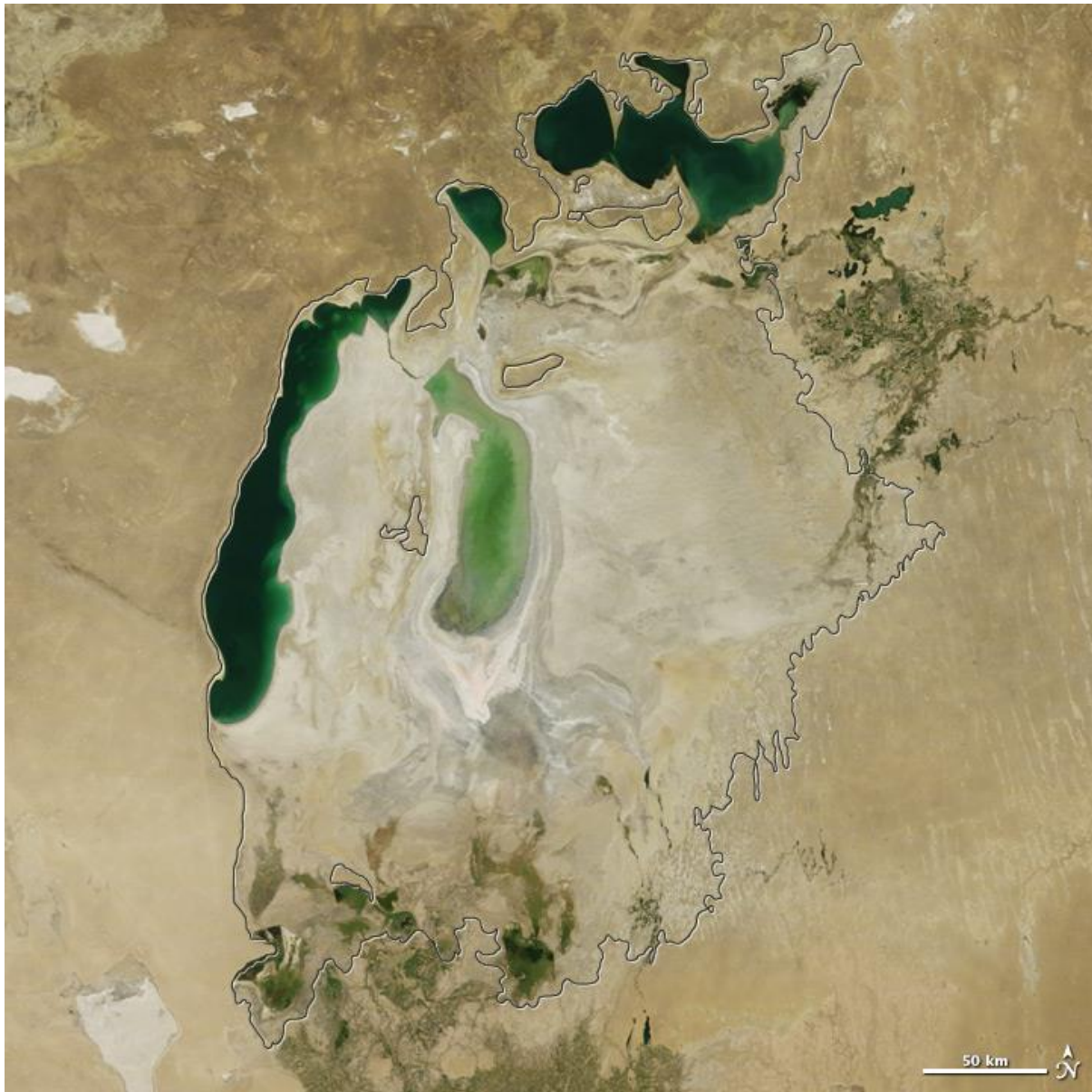


2009

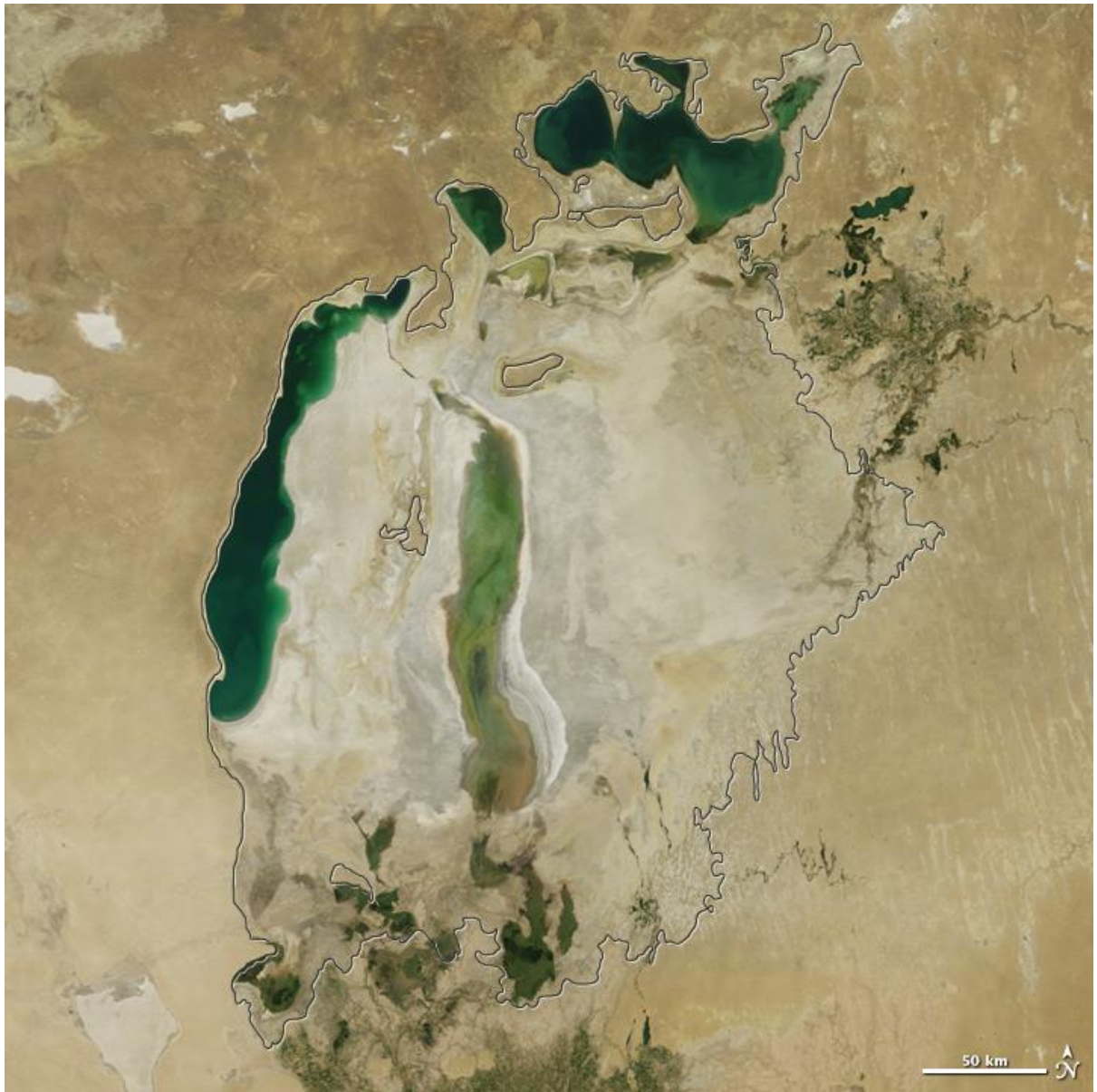


2010



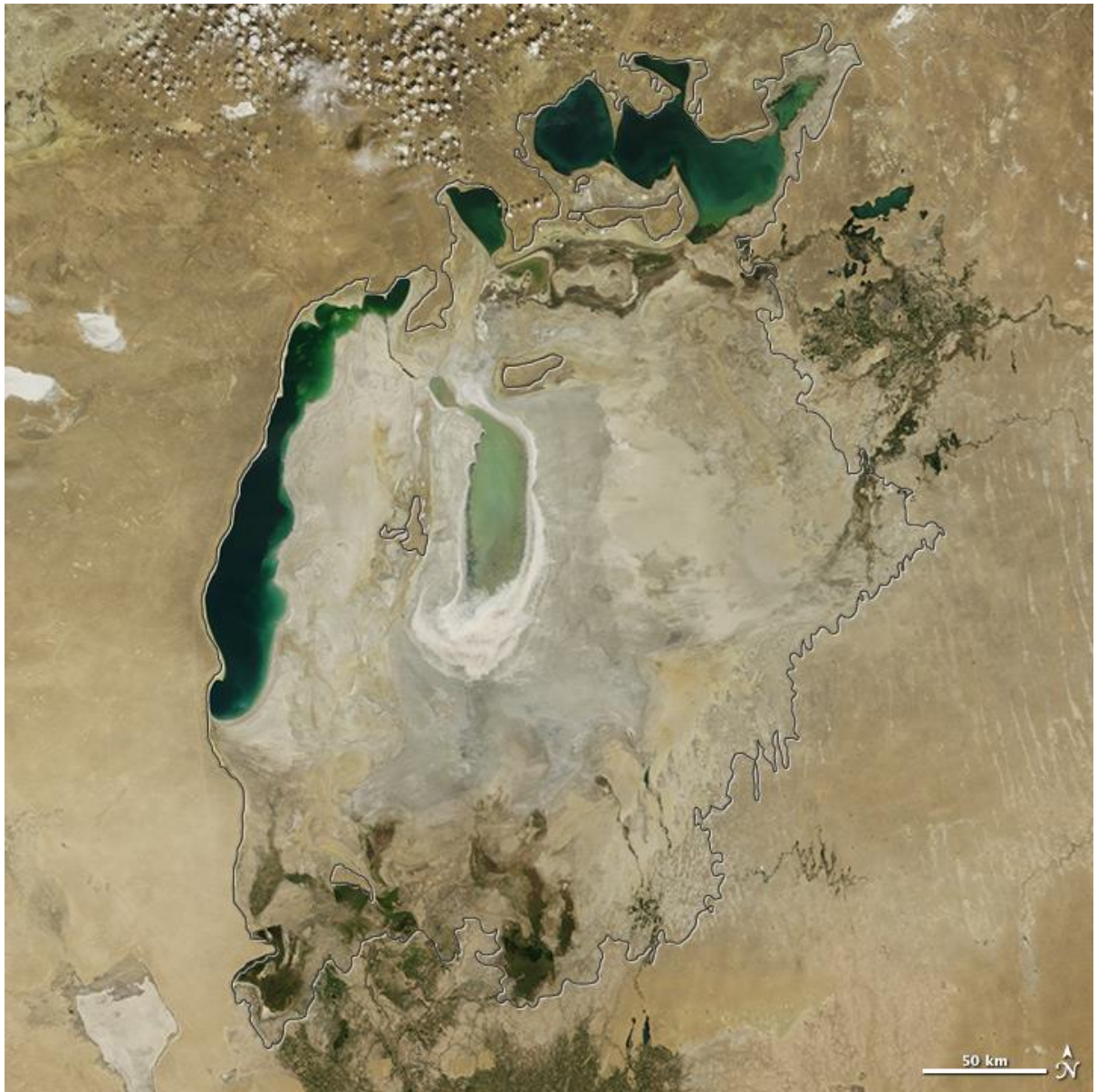


2011



2012



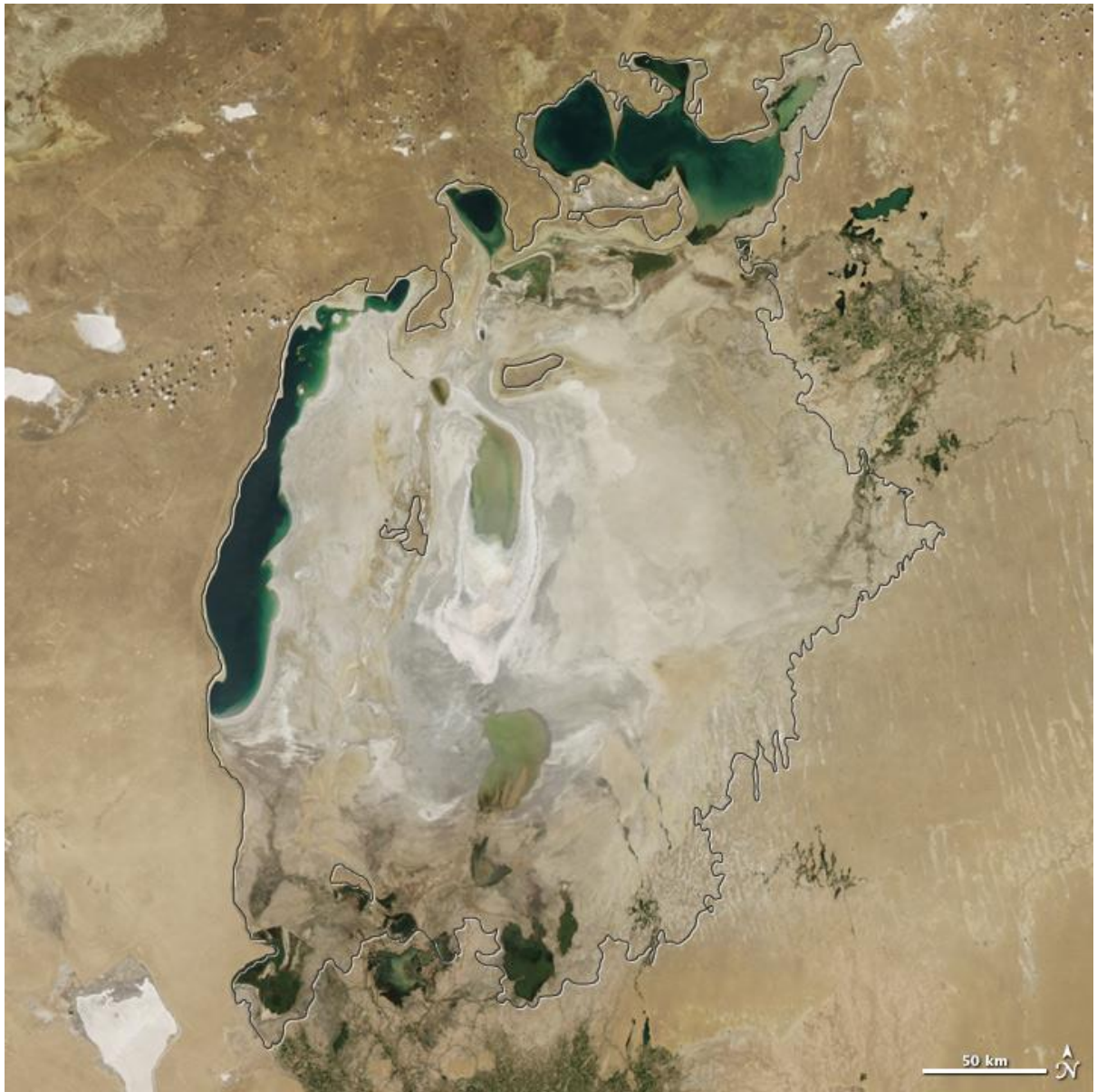


2014



2015





2016