

Glint Solar Case

Good luck with this case! When you are finished, please send your written answers and access to code to john@glintsolar.co. Also, please feel free to give us feedback on the case itself.

Note: You could probably spend a lot of time on this case if you wanted (or if you get stuck), but this case is not meant to take more than half a day or so, so don't overdo it. If you get stuck, or have any questions don't hesitate to reach out.

Context

Our goal at Glint Solar is to accelerate the adoption of renewable energy by speeding up the planning and development phase, while at the same time improving outcomes and reducing cost. We are doing this by software that is fast and easy to use, and allows for quick screening and evaluation of potential sites. We currently have two slightly different versions of this software, one for ground mount solar and one for floating solar (that is, solar panels placed on bodies of water).

Case

1 Training data for image-based lake classification

For solar developers looking to build floating solar, it is often easier to get permission to build on artificial water bodies (e.g. hydro-power reservoirs, water treatment plants etc.), therefore these are often preferred over natural lakes, rivers and other water bodies. In order to let our customers find all artificial water bodies in an area we want to train a machine learning model to classify any given water body as either artificial or not. To do this we need training data. It may be possible to find ready-made training data but for now we shall focus on the following datasets: [Water Bodies in Rhode Island](#) and [National Inventory of Dams](#) which has the locations and purposes of dams structures in the US.

- a. Download the relevant data using the above links, and visualize the largest *water body* in Rhode used for water supply. (not using the built in map view of the first link)
- b. Make a script that uses the data you got in (a) to identify all the *water bodies* in Rhode island that are likely to be artificial. Please explain your reasoning, and show your findings in a suitable manner.

- c. Use the supplied code to download cropped Sentinel-2 images for the 3 largest and the 3 smallest water bodies in Rhode island
- d. Suppose you were to build an application that takes as input the bounding box of a lake, and returns whether that lake is artificial or not.
 - i. Describe your approach. What needs to be done? How would you do it?
 - ii. What are some potential challenges? Any ideas for how to handle them?

Tip: geopandas and shapely are nice tools to consider for a) - c)