Defining routing of the subsea gas pipeline of the Snøhvit field.

The Norwegian Petroleum Directorate is planning to build a 24-inch gas pipeline that will transport 20 million standard cubic meters of gas per day from the Snøhvit gas field (coordinates: 71.6, 21) to the LNG plant in Melkøya (70.69, 23.599), for further export to customers in USA and Europe using LNG tankers.

The pipeline will follow the subsea floor. The gas production of the Snøhvit field is very important for power generation in Spain. Additionally, The pipeline is very strategic because it could be used to connect other future fields in the Barents Sea to the LNG plant.

You are in the pipeline design team. Your main task is to propose the best pipeline path considering the following:

- Pipeline length should be minimum to reduce costs and environmental impact and pressure drop.
- The pipeline should be, for the most part, submarine.
- The pipeline should not traverse cities.
- The pipeline should not traverse tall mountains or require building tunnels.
- The pipeline should not traverse protected areas such as national parks.

Additionally, you are required to provide the following:

- Estimates on pipeline length, cost and pressure drop
- Make a 2D color plot showing the depth of the seafloor as a function of latitude and longitude for the area where the pipeline will be placed
- Plot the pipeline trajectory on a map, showing the coastline, and the start and end point.

Useful data:

- The cost of the pipeline is 3.4 million USD per km.
- The pressure drop (DP in bar) is a function of the pipeline length, DP = 0.12 * L. (with L in km)