# Methods

Kriging

Choosing the right interpolation method for your solar radiance data depends on several factors, including the nature of your data, the geographic context, and the specific goals of your analysis. Let's discuss the four methods you mentioned: Ordinary Least Squares (OLS), Thiessen Polygon, Inverse Distance Weighting (IDW), and Kriging.

### 1. Ordinary Least Squares (OLS):

- \*\*OLS\*\* is typically used for linear regression, not spatial interpolation. It doesn't account for the spatial structure of the data.

### 2. Thiessen Polygon (or Voronoi Diagram):

- \*\*Thiessen Polygons\*\* create areas of influence around each data point. Each point in the polygon is closest to its corresponding data point than any other.

- \*\*Suitability\*\*: Good for discrete and evenly distributed data points. However, it doesn't consider the actual variation between points, which can be a limitation for environmental data like solar radiance.

### 3. Inverse Distance Weighting (IDW):

- \*\*IDW\*\* assumes that the variable being mapped decreases in influence with distance from its location. Closer points have more influence than distant ones.

- \*\*Suitability\*\*: Useful for continuous data and can be good for solar radiance if you assume that radiance values are more similar to nearby locations. The main drawback is that it doesn't consider the spatial autocorrelation structure.

### 4. Kriging:

- \*\*Kriging\*\* is a more advanced geostatistical method that estimates the spatial autocorrelation from the data and uses this to inform the interpolation.

- \*\*Suitability\*\*: Excellent for environmental data like solar radiance. It considers both the distance and the degree of variation between known data points, providing more statistically robust estimates.

### Recommendation for Solar Radiance Data:

- \*\*Kriging\*\* would generally be the preferred choice for interpolating solar radiance data, as it can provide a more accurate and statistically informed estimation of solar radiance values across different locations. It takes into account the spatial correlation inherent in environmental data, which is a significant advantage over simpler methods like IDW or Thiessen Polygons.

- \*\*IDW\*\* can be a simpler alternative if computational resources or data limitations prevent the use of Kriging. It's less complex and can still provide reasonable estimates if the assumption of decreasing influence with distance holds true.

In conclusion, for solar radiance data across Indonesia, which likely exhibits complex spatial patterns and relationships, Kriging offers a more sophisticated and potentially accurate approach, while IDW serves as a simpler yet effective alternative.

# Criteria

Suitablility:

Inclination less than 15 degree  
Use Elevation data from DivaGis

Protected areas 2km away  
Use Protected planet data

Urban Area 2km away  
Land Use Not Tree Cover of any Sort   
<https://data.apps.fao.org/catalog/iso/f3f61bb2-78bf-4aba-a5ba-e708183336ec>   
UN  
only 40 50 110 190

Criteria:

Generation  
Use interpolated data, raw from esa  
range  
cutoff

Wind Speed  
DTU Global Wind Atlas  
0-5 1  
>5 0

Distance to Transmission Line  
Use OSM data  
range  
cutoff

Distance to Road  
Use DivaGis  
range  
cutoff

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Gen | WS | DtT | DtR |
| Gen | 1 | 6 | 3 | 4 |
| WS |  | 1 | 1/4 | 1/4 |
| DtT |  |  | 1 | 2 |
| DtR |  |  |  | 1 |

# Reference

Indonesia population prediction link <https://www.statista.com/statistics/915223/indonesia-population-based-on-study-of-bps/>

296 million