http://gis.utah.gov/developer

Solar Mapping

and AGRC's role

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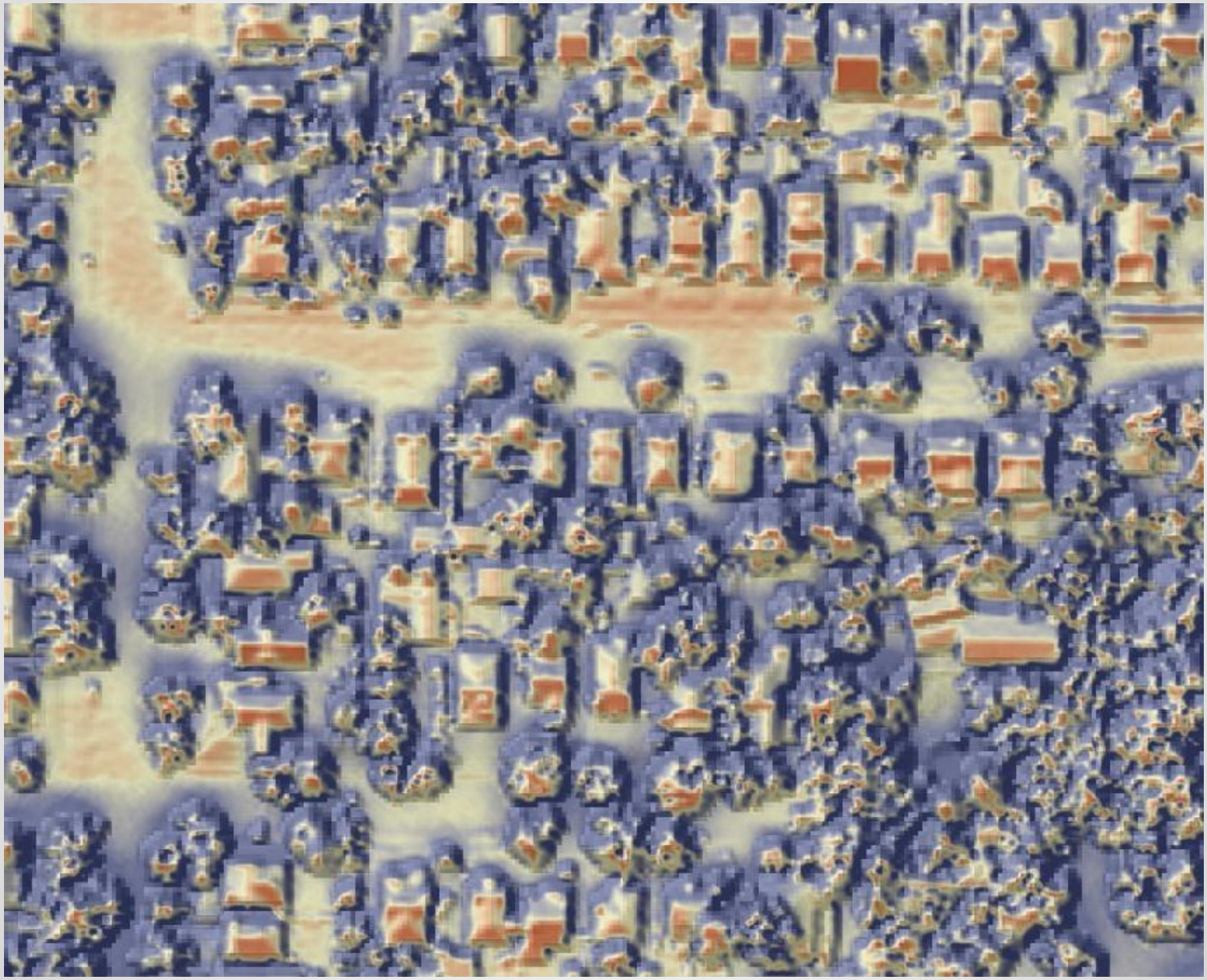
Location - Base Maps

The solar map is able to integrate an AGRC base map with one line of code.

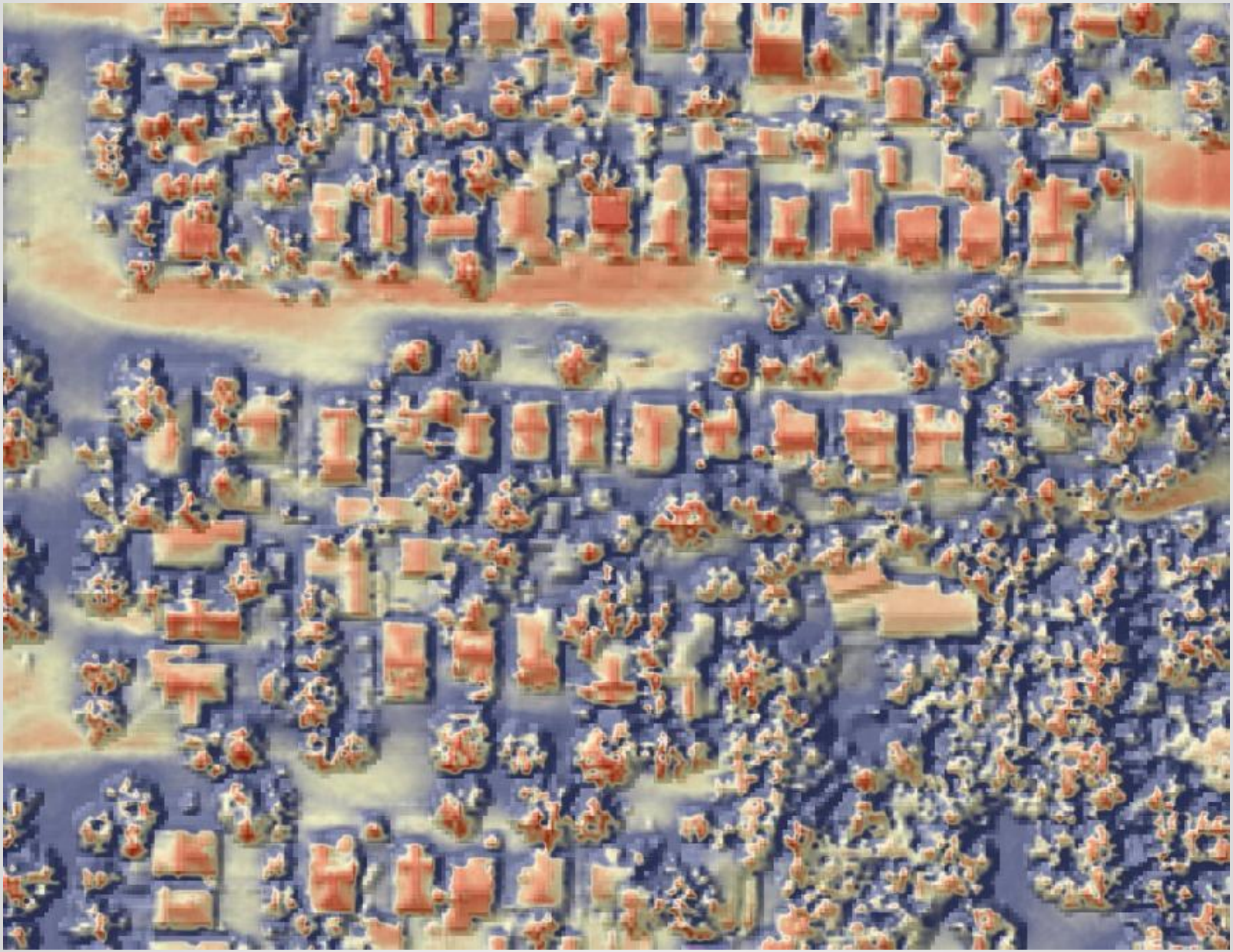
```
SaltLakeCity.UT.US.GIS.Mapping.Config = new function () {
    return {
        /** Base Map ArcGIS Server Service */
        BaseMapService: "http://mapserv.utah.gov/ArcGIS/rest/services/UtahBaseImagery-Detailed/MapServer/",
```

http://gis.utah.gov/developer/base-maps/

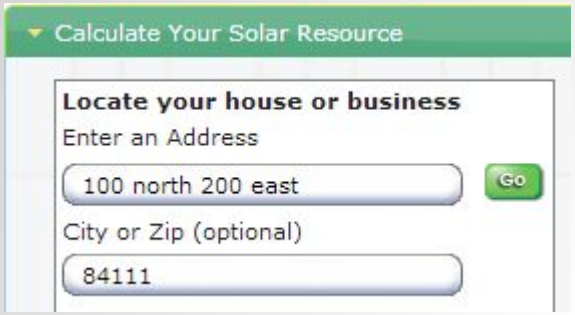
Base Maps - Sunlight Intensity

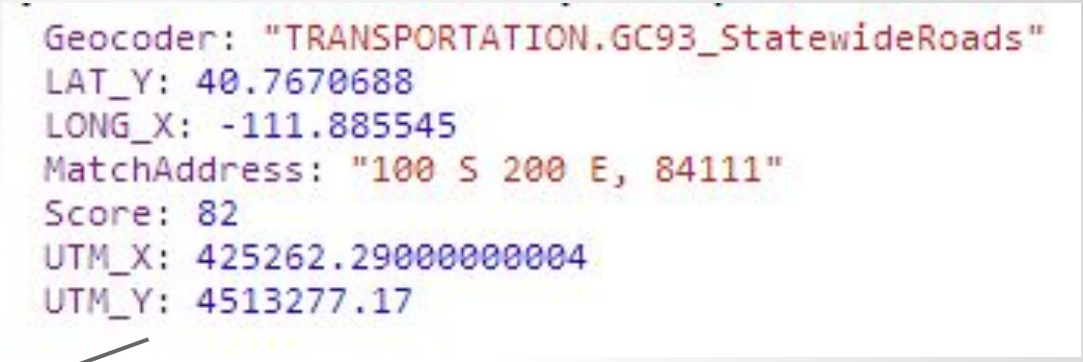


Base Maps - Hours of Sunlight



Location - Geocoding





The solar website is able to send a http request for an address to our geocoding web service. Our service sends back a response allowing the solar website is able to show a point on the map.

http://gis.utah.gov/developer/web-services/

Solar Analysis - The Process

Draw a shape.

Simplify the shape.

Submit the shape for Analysis.

Get shape information.

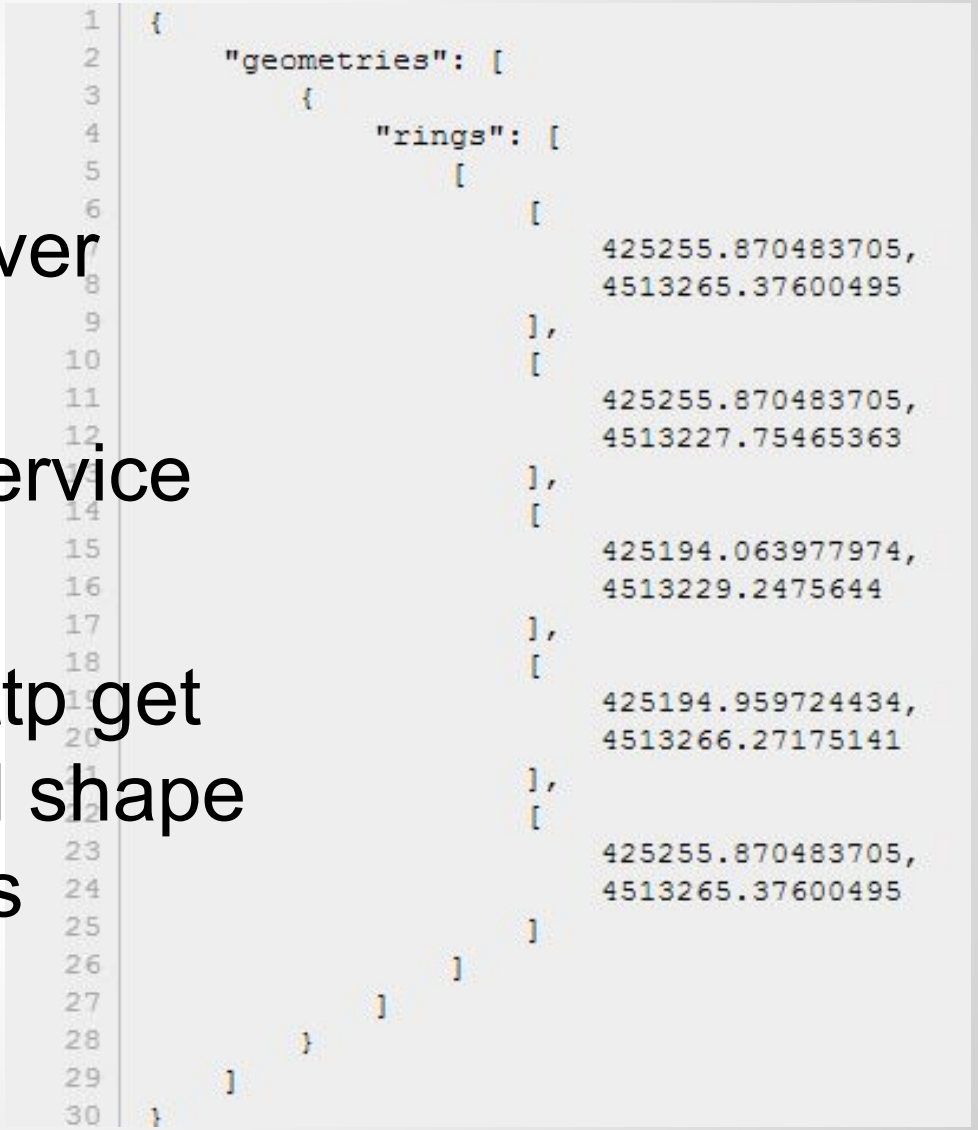
Display results.

Solar Analysis - Simplifying

AGRC runs ArcGIS Server

Provides a Geometry Service

Solar site is making a http get request to create a valid shape from a list of coordinates



```
{
    "geometries": [
        {
            "rings": [
                [
                    [
                        425255.870483705,
                        4513265.37600495
                    ],
                    [
                        425255.870483705,
                        4513227.75465363
                    ],
                    [
                        425194.063977974,
                        4513229.2475644
                    ],
                    [
                        425194.959724434,
                        4513266.27175141
                    ],
                    [
                        425255.870483705,
                        4513265.37600495
                    ]
                ]
            ]
        }
    ]
}
```

Solar Analysis - Submit Shape

```
{
    "poly": [
        -111.88634141365428,
        40.76696452886618,
        -111.88561967623518,
        40.76696200077336,
        -111.88561517726173,
        40.76662312547077,
        -111.8863475946399,
        40.7666309510934,
        -111.88634141365428,
        40.76696452886618
    ],
    "durThresh": 300
}
```

Then the shape gets sent to us as a lat/long polygon array.

Solar Analysis - Process

Build a geometry from the lat long array

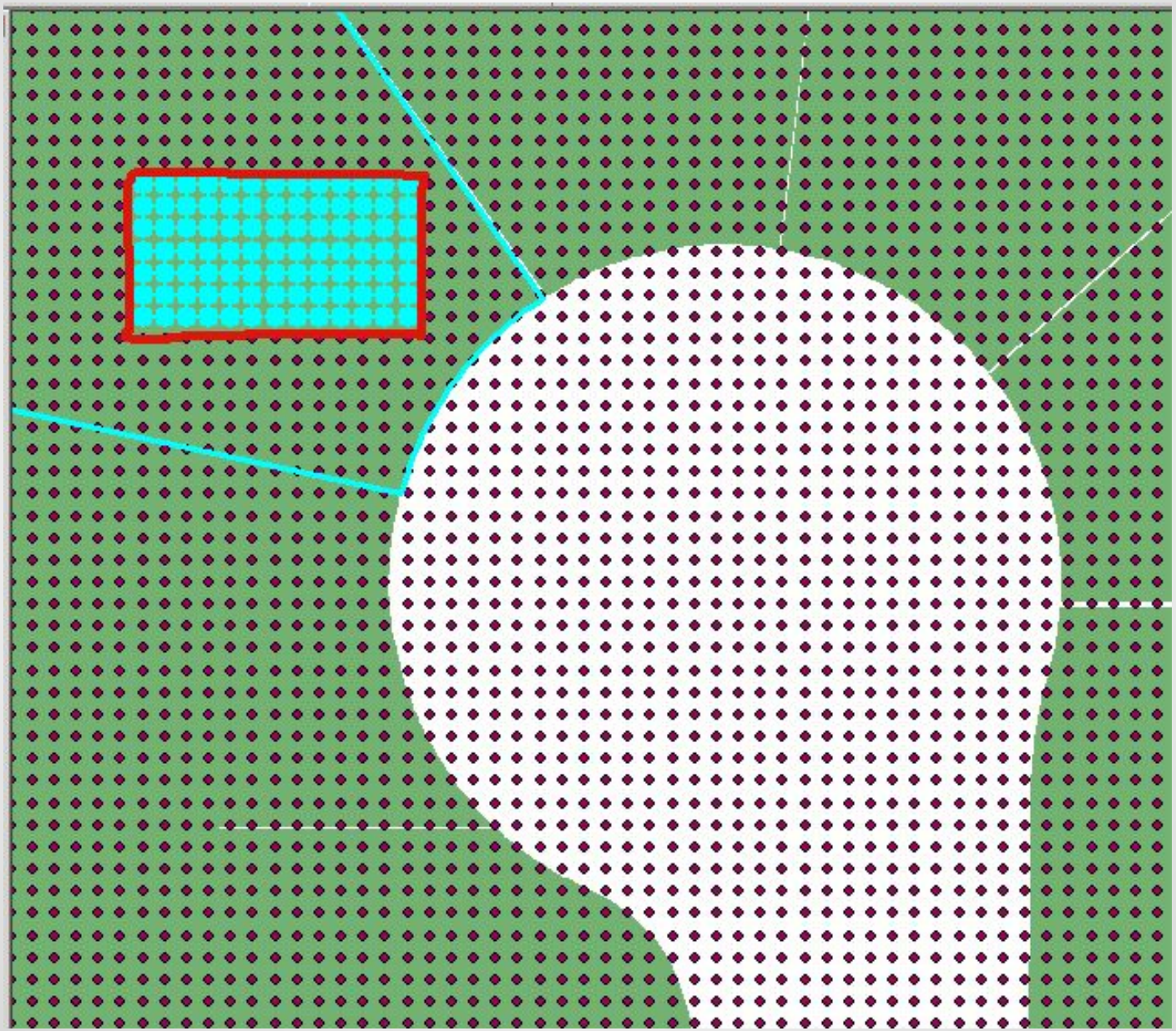
Query Solar Data Points (1 meter spacing)

Each point carries 12 monthly values for:

- SOLar radiation (flush mount)
- DURation of sunlit hours (rack mount)

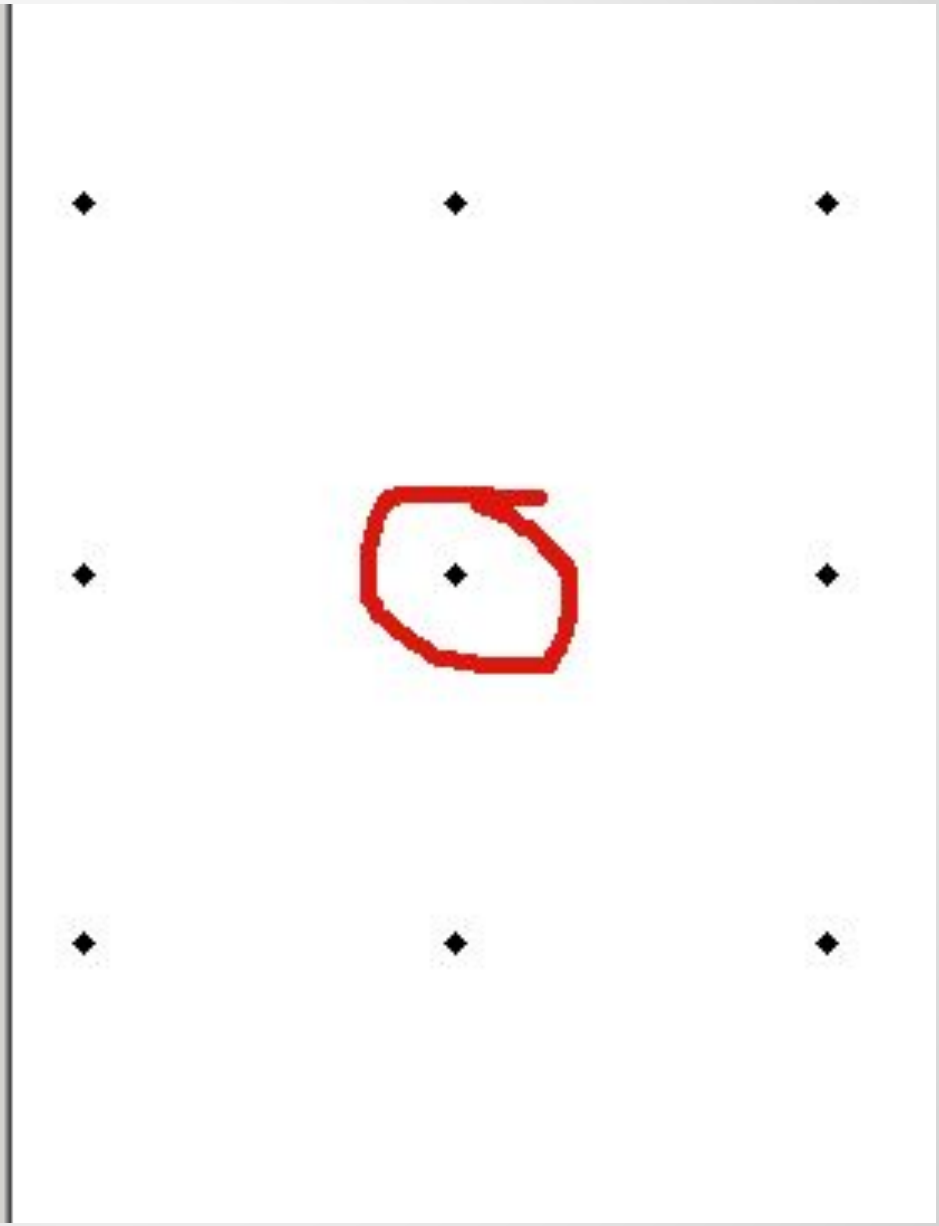
Aggregate the results

Solar Analysis - Representation



Solar Analysis - Point Data

SOL1	70896
SOL2	83475
SOL3	125648
SOL4	161794
SOL5	194005
SOL6	171155
SOL7	159225
SOL8	135214
SOL9	85912
SOL10	60957
SOL11	52181
SOL12	50489
DUR1	274
DUR2	273
DUR3	346
DUR4	378
DUR5	442
DUR6	412
DUR7	431
DUR8	405
DUR9	336
DUR10	328
DUR11	270
DUR12	228
SOLANN	1350951
DURANN	4125



Solar Analysis - Aggregation


```
{
    "SolarValues": {
        "directDur": [
            116,
            138,
            200,
            244,
            303,
            294,
            300,
            269,
            205,
            173,
            120,
            88
        ],
        "directRad": [
            46214,
            55520,
            86550,
            114368,
            139590,
            123909,
            115170,
            96377,
            60265,
            41507,
            34288,
            33295
        ],
        "durArea": 2224
    }
}
```


Get all points contained in submitted Polygon

Sum the SOLar radiation and average the sunlit DURation and return an array.

This creates the input for the google chart api.