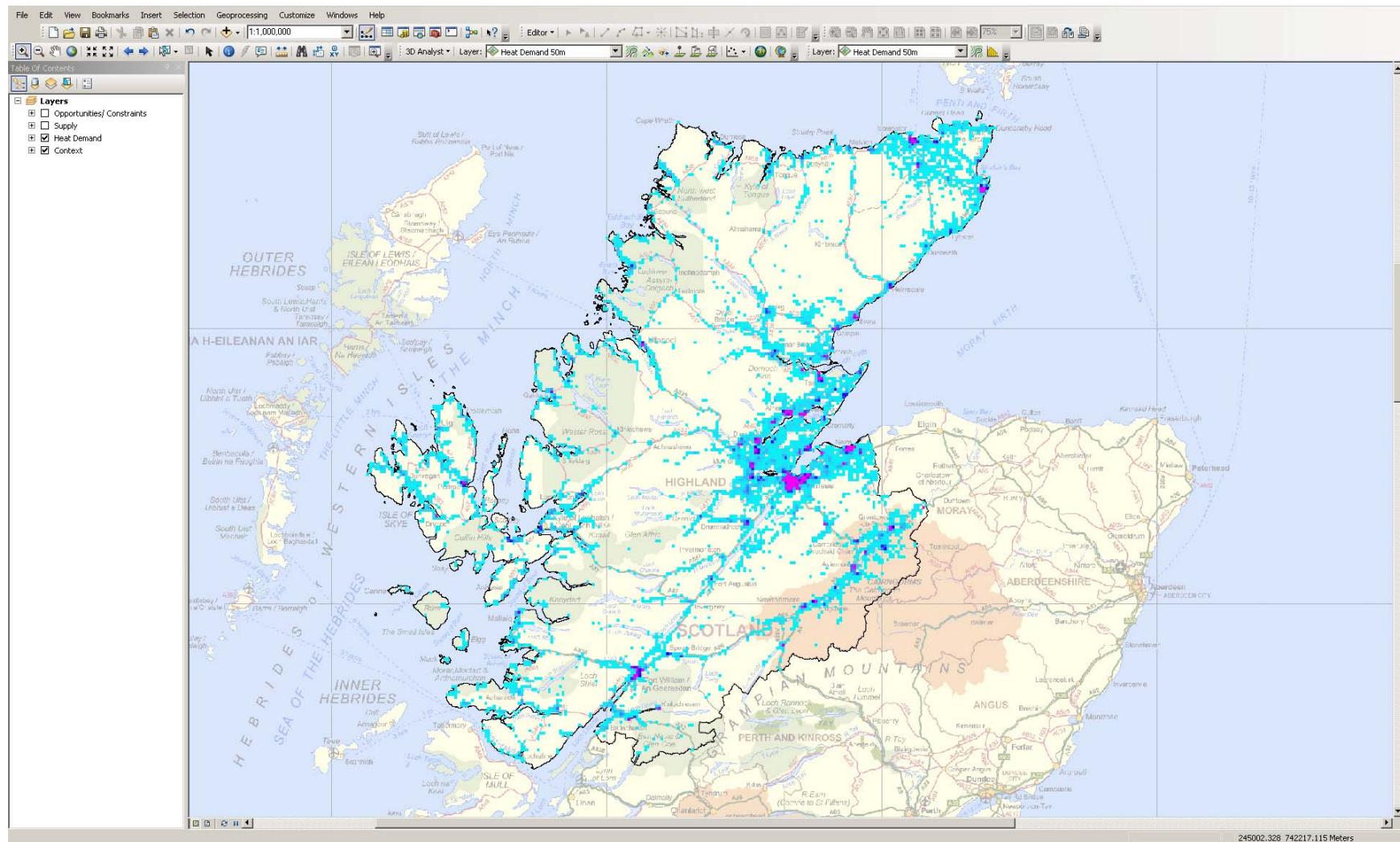# Use and Application of the Heat Map

Functionality

The use of GIS brings a range of additional functionality to the Heat map. Functions include:

- Viewing

- Interrogation

- Spatial Analysis

- Predictions

- Update/ monitoring

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Comhairle na Gàidhealtachd

Viewing

At its simplest level the Heat Map can be used to view information about a range of topics related to renewable heat in the Highlands: Viewing options include:

• Zoom in/ out

• Switching on/ off layers

• Change symbology

• Isolating features
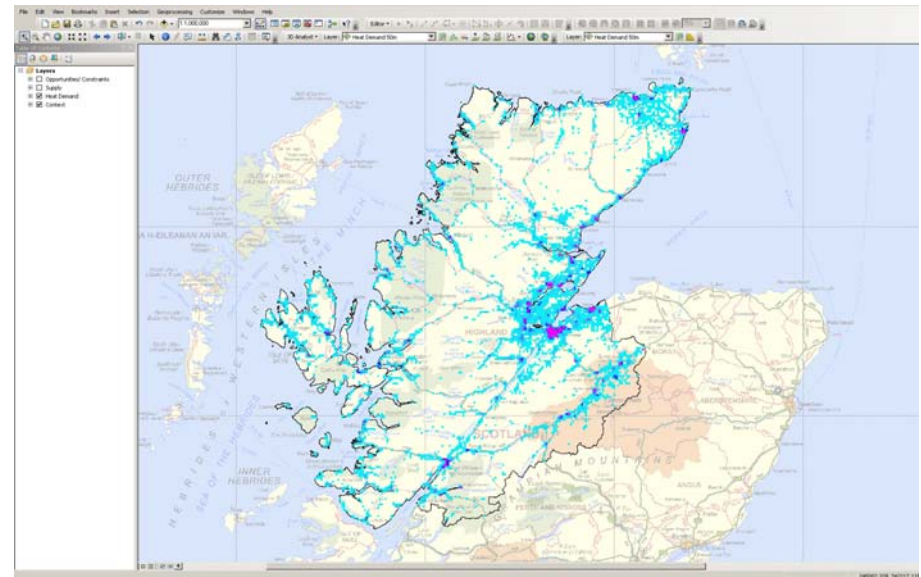
LIVE DEMONSTRATION

Interrogation

The Heat Map has been developed to be mainly used within a GIS environment. One major difference between using the map within GIS and as a traditional hard copy format is the range of additional information that can be accessed from each layer within the map. This is known as **attribution**.

Each layer exhibits a range of useful existing attribution.

LIVE DEMONSTRATION

Analysis

As part of the Heat Map development a range of GIS functionality was agreed and developed. A series of tools were created for use by Highland Council staff providing the following functionality:

- Scenario development

- Development Proposals Summary

- Search – Areas of High/ Low demand

- Search – Skills/ Suppliers

- Postcode reporting

- Identifying clusters of heat demand and fuel poverty

- Data update

Scenario development

The challenge:

Understanding the impact of new/ proposed developments on heat demand within a defined area.

The solution:

Build a tool which allows the user to create a new Heat Map based upon future development scenarios
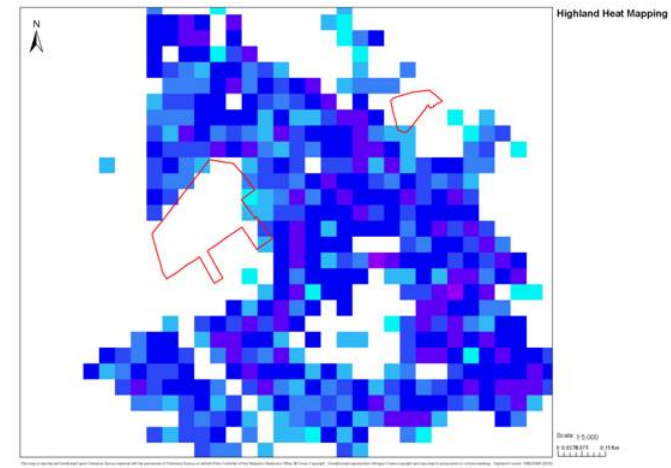
Required information:
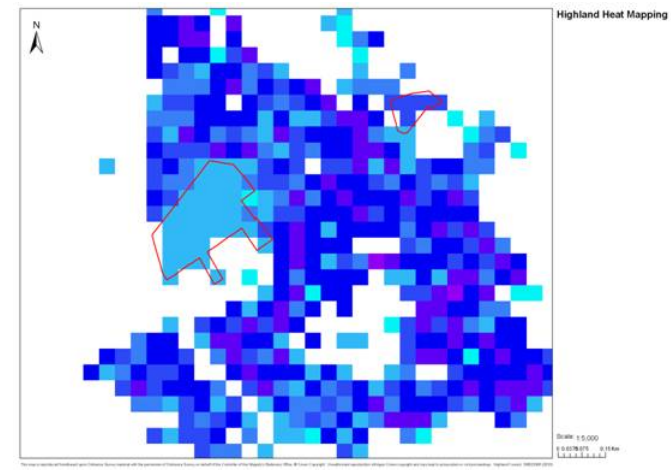
• Development location

• Development details

Outputs:

Revised Heat Map that can be analysed further for relationship to potential sources of heat supply

Before

After

Highland Heat Mapping
Scenario Development

Legend

Proposed development

Revised Heat Map

kWh/km2

- 1 - 1,500
- 1,500 - 3,000
- 3,000 - 4,500
- 4,500 - 6,000
- 6,000 - 10,000
- 10,000 - 20,000
- 20,000 - 50,000
- 50,000 - 100,000
- 100,000 +
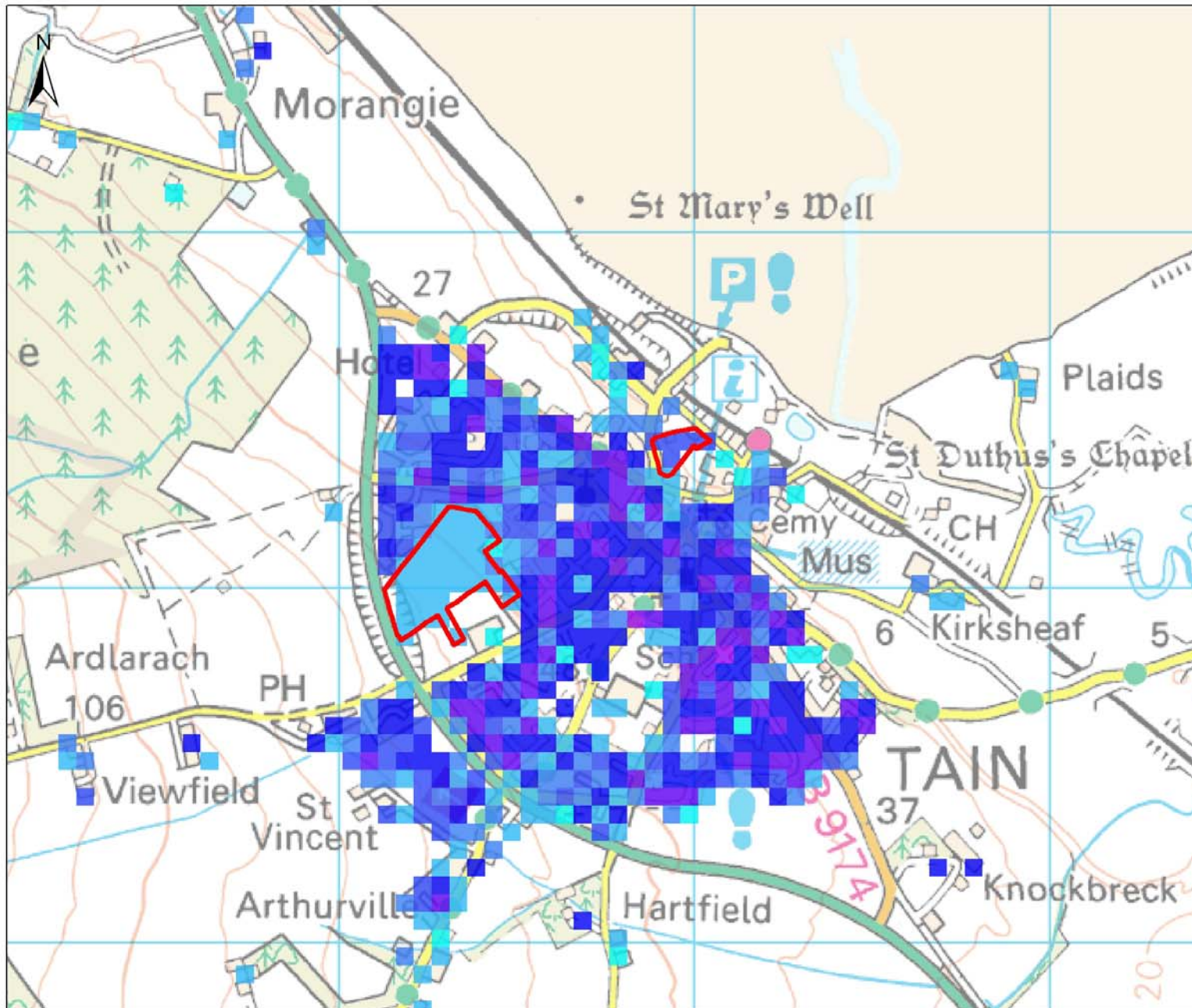
Scale: 1:10,000
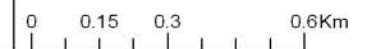
0   0.15   0.3   0.6Km

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Development Proposals Summary

The challenge:

Summarise heat demand and supply within a user specified location.

The solution:

Analyse the spatial relationship of new/ proposed development in relation to existing heat demand and potential supply

Required information:

• Development location

• Search distance

Outputs:

Tabular summary for specified statistics

hland Heat Mapping

nario Development

end

Clynelish distillery

ed Heat Map

m2

1 - 1,500

,500 - 3,000

3,000 - 4,500

4,500 - 6,000

Table

Area_Stats5

	Rowid	OBJECTID_12_13	FREQUENCY	SUM_EV_KMKWH	MAX_EV_KMKWH	SUM_EV_KMKWH_1	MEAN_CONFIDENCE
▶	1	0	5607	9765279.204666	1176886.5	0	2.55904

I◀ ◀   1   ▶ ▶I   (0 out of 1 Selected)
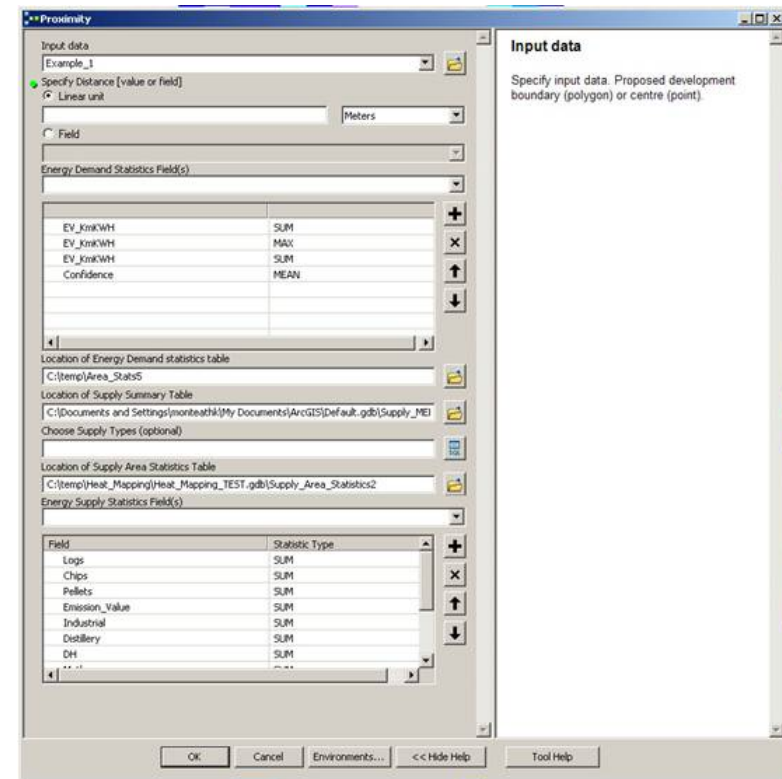
Area_Stats5

EV_KmKWH   MAX
EV_KmKWH   SUM

Table

Supply_Area_Statistics_EXAMPLE

	OBJECTID *	FREQUENCY	SUM_Logs	SUM_Chips	SUM_Pellets	SUM_Emission_Value	SUM_Industrial	SUM_Distillery	SUM_DH	SUM_Methane	SUM_Landfill	SUM_Coal	SUM_LPG	SUM_Oil
▶	1	15	1	1	1	247586	2	5	<Null>	2	<Null>	3	<Null>	1

I◀ ◀   1   ▶ ▶I   (0 out of 1 Selected)

Supply_Area_Statistics_EXAMPLE

Field   Statistic Type

Table

Supply_Summary_EXAMPLE

	OBJEC	Name	Logs	Chips	Pellets	Comments	Emission_Value	Type	UPRN	Industrial	Distillery	DH	Methane	Landfill	Coal	LPG	Oil
	1	Inverness Tree Services	1	1	<Null>	may be able to supply pellets shortly	<Null>	Woodfuel	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>
	2	Balcas Ltd	<Null>	<Null>	1	<Null>	<Null>	Woodfuel	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>
	3	Wood Group Engineering Ltd, Nigg	<Null>	<Null>	<Null>	Below reporting threshold for emission values	<Null>	Existing industrial heat production	<Null>	1	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>
	4	Trouw (UK) Ltd, Skretting, Inverbreakie Ind Estate	<Null>	<Null>	<Null>	Below reporting threshold for emission values	<Null>	Existing industrial heat production	<Null>	1	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>
	5	Teaninich Distillery Teaninich Alness IV17 0XB	<Null>	<Null>	<Null>	<Null>	13049	Distillery	130069342	<Null>	1	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>
	6	Dalmore Distillery Alness IV17 0UT	<Null>	<Null>	<Null>	<Null>	15465	Distillery	130089705	<Null>	1	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>
	7	Balblair Distillery Edderton Tain IV19 1LB	<Null>	<Null>	<Null>	<Null>	6428	Distillery	130061179	<Null>	1	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>
	8	Invergordon Distillery Golf View Terrace Invergor*	<Null>	<Null>	<Null>	<Null>	193313	Distillery	130117845	<Null>	1	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>
	9	Glenmorangie Distillery Glenmorangie Tain IV19 1P*	<Null>	<Null>	<Null>	<Null>	19331	Distillery	130107993	<Null>	1	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>
	10	Wood Group Engineering, Nigg	<Null>	<Null>	<Null>	<Null>	<Null>	Methane	<Null>	<Null>	<Null>	<Null>	1	<Null>	<Null>	<Null>	<Null>
	11	Petley Hybrids, Petley Farm	<Null>	<Null>	<Null>	<Null>	<Null>	Methane	<Null>	<Null>	<Null>	<Null>	1	<Null>	<Null>	<Null>	<Null>
	12	Mackenzie Bros	<Null>	<Null>	<Null>	<Null>	<Null>	Coal	<Null>	<Null>	<Null>	<Null>	<Null>	1	<Null>	<Null>
	13	Bruce Lindsay Coal Ltd	<Null>	<Null>	<Null>	<Null>	<Null>	Coal	<Null>	<Null>	<Null>	<Null>	<Null>	1	<Null>	<Null>
	14	W G Mackay	<Null>	<Null>	<Null>	<Null>	<Null>	Coal	<Null>	<Null>	<Null>	<Null>	<Null>	1	<Null>	<Null>
	15	Scottish Fuels	<Null>	<Null>	<Null>	<Null>	<Null>	Oil	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	1

I◀ ◀   0   ▶ ▶I   (0 out of 15 Selected)

Supply_Summary_EXAMPLE

6Km

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Search – Areas of High/ Low Demand

The challenge:

To identify significant clusters of heat demand in a user specified location.

The solution:

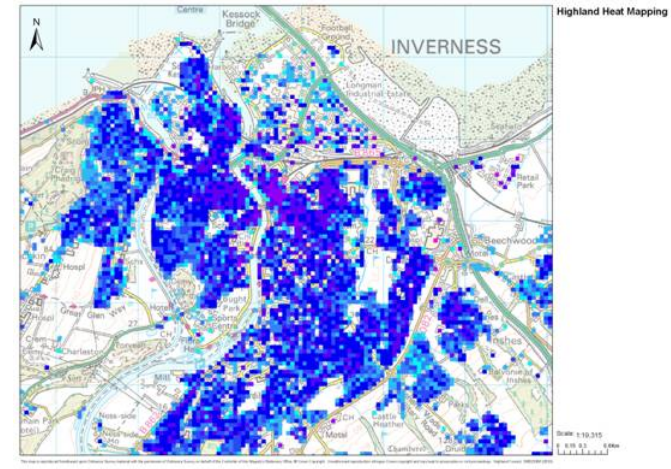Calculate the density of existing heat demand

Required information:
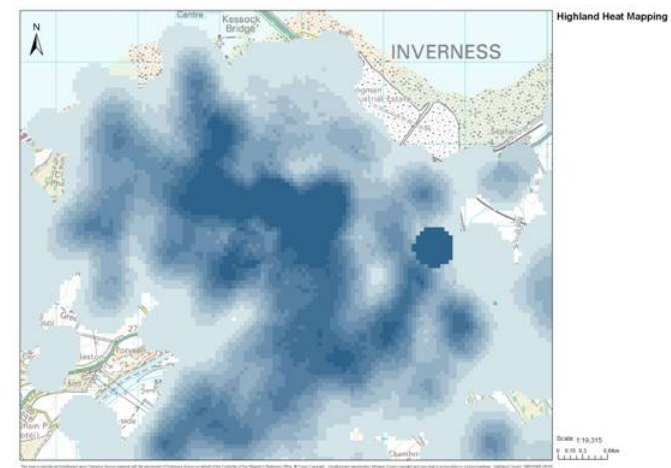
• Search location and radius

• Output settings

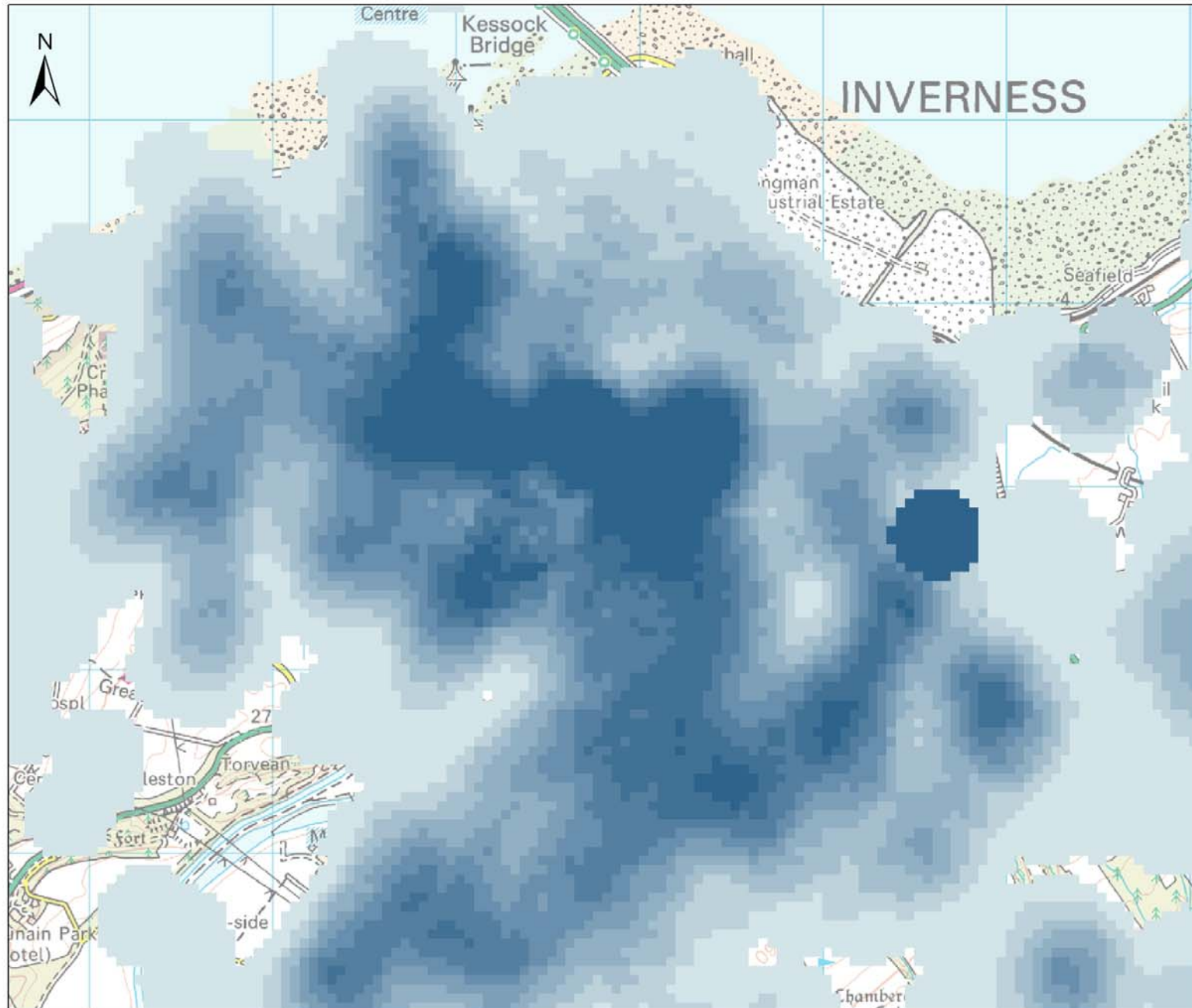**Outputs:**

Density Map of Heat Demand

Before

After

Highland Heat Mapping

INVERNESS

Scale: 1:19,315

0   0.15 0.3   0.6Km

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Search – Skills/ Suppliers

The challenge:

Identify the skills & technology database within a specified distance of a selected location

The solution:

Analyse the Skills database to provide relevant information for the search area

Required information:

• Search location and radius

• Specification of skills to be searched

Outputs:

Tabular summary

Postcode Reporting

The challenge:

Summarise heat demand and supply within a specified distance of a selected postcode

The solution:

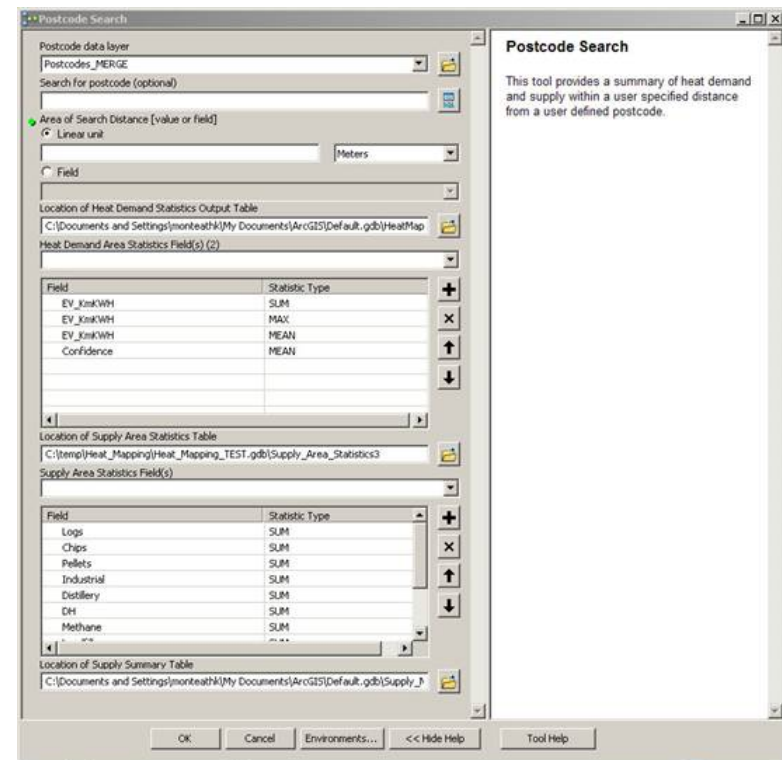Analyse heat demand and supply within the specified location

Required information:

Postcode location & search radius

Output statistics preference

Outputs:

Tabular summary

Summary

The functionality extends the use of the map beyond a traditional simple hard copy format.

The format of the map means it is flexible in how it can be used and can respond to the differing needs of users.

The main limitations that exist relate to:

- Knowledge/ awareness of users

- Data in some instances