



# Ground Temperature Predictor

groundtemperatures.com

DEMO

Choose depth and date for single point predictions.

Select a location, anywhere on land.

**1. Geographic Location of Prediction**

Select the location of your ground temperature prediction by entering either the coordinates, or selecting on a map.

Latitude: 32.38052 Longitude: -97.46634

Enter address/location

Location: 32.38052, -97.46634  
Depth: 162 m  
Date: September 1

**Inputs:**

**GET RESULTS**

Predicted Temperature: 23.28°C

Get AI predicted point temperature in seconds.

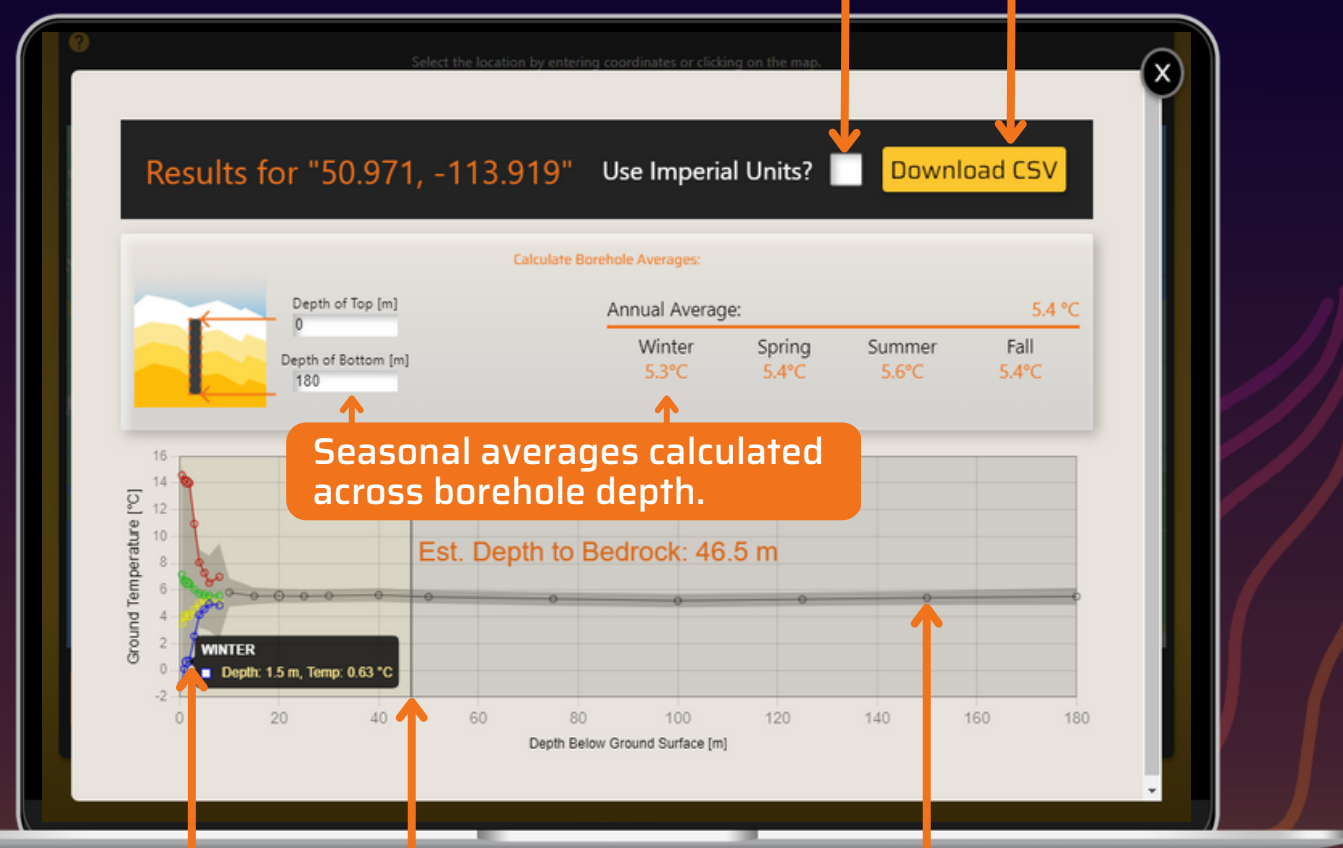
## NEW FEATURE

### Borehole Mode:

Get AI predicted vertical temperature profiles in minutes, just by selecting a location.

Automatic unit conversions.

Download all result data.



Temperature profiles from over 70 predicted points.

Includes AI predicted depth to bedrock from SoilGrids.

Upper and lower bounds with standard error by depth.



# Soil Thermal Conductivity & Geotech Predictor

soilconductivity.com

Input or predict geotechnical details with AI.

**1. Bulk Density**

What is the dry Bulk Density of your soil? If you have a value, type it into the manual input section, OR autofill using Umny AI predictions.

**Prediction Results:**

Our prediction for Bulk Density is 1.651 g/cm3

Our prediction for Carbon is 0.003 g/cm3

Our prediction for Silt is 26.257 mass %

Our prediction for Clay is 29.65 mass %

Our prediction for Sand is 44.154 mass %

Our prediction for Rocks is 7.857 volumetric %

**Thermal Conductivity Inputs**

Input	Value	Unit
Bulk Density	1.87	g/cm3
Carbon	0.35	%
Rocks	11.37	%
Sand	38.98	%
Silt	23.18	%
Clay	26.17	%
Water	20	%
Temperature	4	°C

Autofill selected inputs using Umny AI

**GET THERMAL CONDUCTIVITY**

Predicted Thermal Conductivity: 1.411 W/mK

You have 3 free Thermal Conductivity Predictions remaining on this subscription this month.

Change API Key

Automatic integration of ground temperature predictor (GTP).

Get AI predicted thermal conductivity in seconds.

DEMO

## Accurate, fast, & easy-to-use apps for:

- Pre-drilling info for better costing, planning, and sizing of equipment
- Finding new resources, such as low-temperature geothermal sites
- Validating physical measurements with accurate AI predictions
- Understanding ground freezing depth and melting risks, especially in permafrost
- Quantifying human/technology impacts on ground temperature (ie. from cities)
- And much more!

## Interested?

Try it out free or subscribe:



PRICING

Ground Temperature Predictor



PRICING

Soil Thermal Conductivity App





# How does it work?

We have collected millions of real-world measurements to teach our AI about the earth.

WATCH

Our custom physics + AI models are trained to recognize patterns in the environment, so they can predict geoscience info, anywhere below ground.

CLIMATIC

FEATURES USED IN PREDICTIONS

GEOSPATIAL

THERMOPHYSICAL + GEOPHYSICAL

HUMAN IMPACT

TOPOGRAPHICAL

# Who are we?

We are specialized to model the complicated physics of the ground.

## 22 Years Experience

Working in engineering (research & consulting) for geothermal, computer programming, construction, and soil science for regenerative agriculture.



Master's and PhD in Computational Fluid Dynamics (CFD).

Contact us about custom pricing, and to hear about our next version release with even more ground properties.

Umny.ca/Contact/

UMNY.CA

Speaking: English, French, Spanish, Arabic



UMNY (oom-knee)

Software to explore the earth.

# How well does it work?

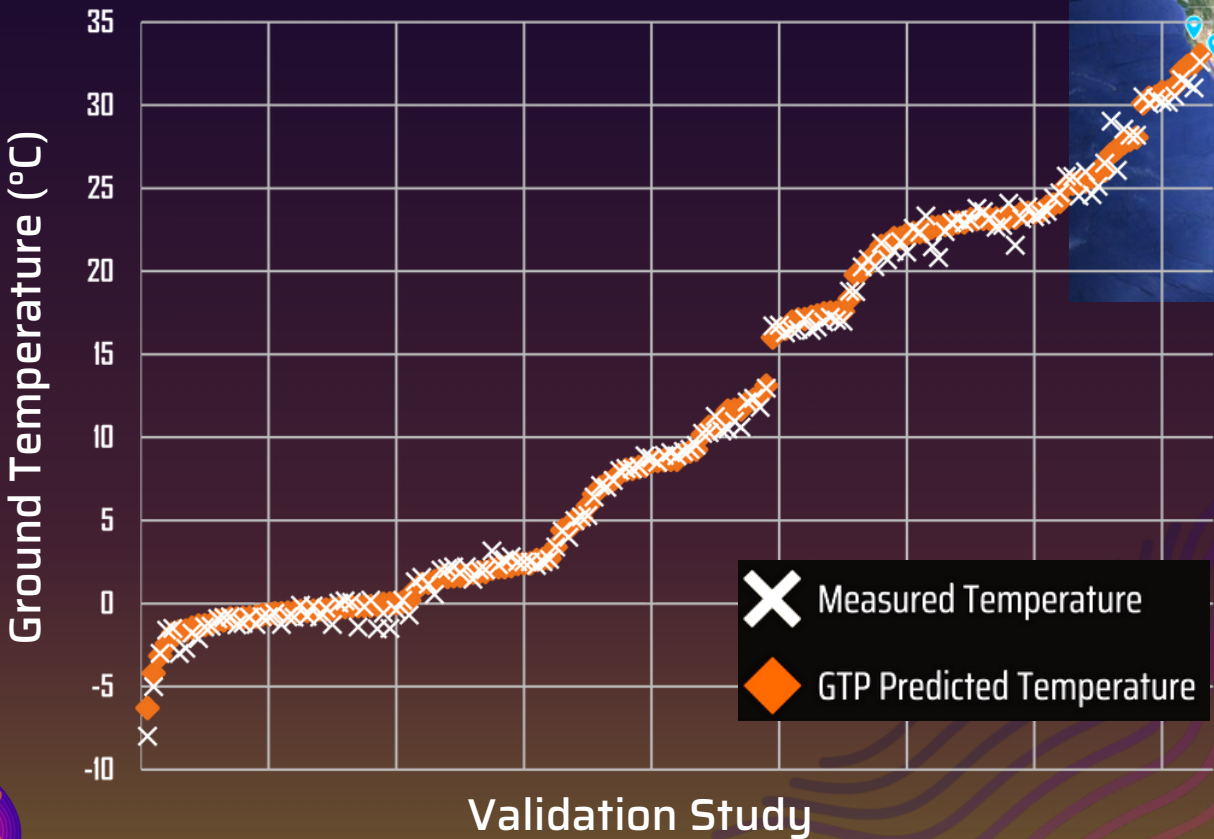
We validate our AI models with high quality real-world measurements from scientists around the earth.

## Ground Temperature Predictor (GTP) Validation

Version 1.0 was tested against over 300 measurements.

Average Error of +/- 0.5°C in most areas.

READ



On average SoK predictions are 32% more accurate than other methods.

READ

## Soil Thermal Conductivity (SoK) Validation

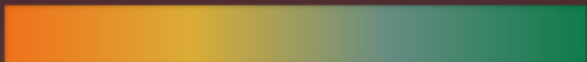
Version 1.0 was tested against best calculation methods.

Comparison of SoK prediction RMSE values with analytical models from [1], for two bulk density groups and varying saturations.

Saturation %		COTE & KONRAD.	LU ET AL.	BALLAND & ARP	UMNY SOK
FINE-GRAINED SOIL	SAT. < 10%	0.081	0.057	0.071	0.058
	10% < SAT. < 20%	0.106	0.080	0.078	0.051
	SAT. < 20%	0.133	0.128	0.147	0.089
	0% < SAT. < 100% (ALL DATA)	0.122	0.113	0.130	0.081
COARSE-GRAINED SOIL	SAT. < 10%	0.157	0.172	0.213	0.114
	10% < SAT. < 20%	0.167	0.189	0.122	0.129
	SAT. < 20%	0.205	0.195	0.164	0.107
	0% < SAT. < 100% (ALL DATA)	0.172	0.182	0.186	0.114

MAX. ERROR

MIN. ERROR



[1] READ ORIGINAL PAPER WITH COMPARISON METHODS

