



Online Apps

for Skyscape Archaeology

Fabio Silva

MA in Cultural Astronomy and Astrology
University of Wales TSD

March 2017



featuring

heywhatsthat

and introducing

skyscapeR v0.3b

Not uncommon to find this during fieldwork:

Not uncommon to find this during fieldwork:



Not uncommon to find this during fieldwork:



No horizon is visible, so what to do?

Assuming a 0° flat horizon is not an option

Options:

- (1) Use a cartographic map to ascertain the horizon
cumbersome, time-consuming, prone to error

Options:

- (1) Use a cartographic map to ascertain the horizon
cumbersome, time-consuming, prone to error
- (2) Use a Geographical Information System (GIS) to reconstruct the horizon as if there was no vegetation
ideal, but getting a good Digital Terrain Model (DTM) costs money, and learning GIS from scratch is very time-consuming (good skill though!)

Options:

- (1) Use a cartographic map to ascertain the horizon
cumbersome, time-consuming, prone to error
- (2) Use a Geographical Information System (GIS) to reconstruct the horizon as if there was no vegetation
ideal, but getting a good Digital Terrain Model (DTM) costs money, and learning GIS from scratch is very time-consuming (good skill though!)
- (3) Use Andrew Smith's *Horizon* software: www.agksmith.net/horizon/
time-wise better than option (2), but still needs a good DTM
also converting DTM to Horizon format is cumbersome

Options:

- (1) Use a cartographic map to ascertain the horizon
cumbersome, time-consuming, prone to error
- (2) Use a Geographical Information System (GIS) to reconstruct the horizon as if there was no vegetation
ideal, but getting a good Digital Terrain Model (DTM) costs money, and learning GIS from scratch is very time-consuming (good skill though!)
- (3) Use Andrew Smith's *Horizon* software: www.agksmith.net/horizon/
time-wise better than option (2), but still needs a good DTM
also converting DTM to Horizon format is cumbersome
- (4) Use Michael Kosowsky's HeyWhatsThat website
fast, easy, reliable (though not always accurate)



www.heywhatsthat.com



WHAT'S HEYWHATSTHAT?

You hike to the top of a mountain or pull off at a scenic overlook. You see mountains in the distance. Which mountains are they? HeyWhatsThat will tell you, providing a 360° panoramic sketch labeled with the names of the peaks you're looking at. From almost anywhere in the world. Via web, email and mobile phone.

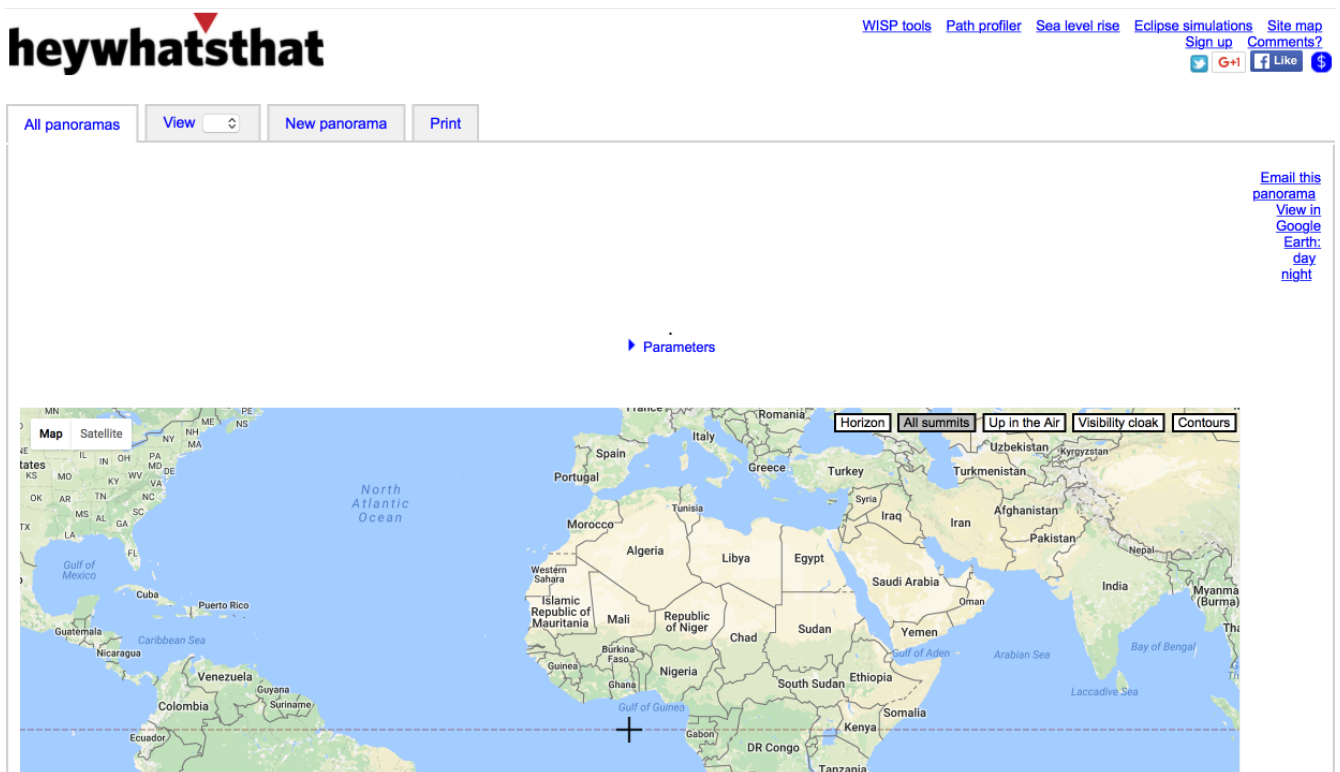
The main site computes the horizon and mountain names and other related visualizations, including the surface of the Earth visible from where you're standing (the visibility cloak or viewshed) and the line of sight profile between you and the distant peaks.

You can view panoramas that someone else has requested and generate your own.

There are also other apps on the website. Check out their description and links here: <http://www.heywhatsthat.com/faq.html>



This is the main page. What you want is the “New Panorama” tab at the top



This is the main page. What you want is the “New Panorama” tab at the top

All panoramas

View

New panorama

Print

[Email this panorama](#)
[View in Google Earth](#)
[day](#)
[night](#)

[Parameters](#)



This allows you to create a new 360° virtual panorama

1. Click on the map ---->

Or search for an address:

e.g. 1600 pennsylvania ave, washington dc
or main & elm, 04843

Or enter your latitude and longitude:

Latitude

Longitude

latitude and longitude can be entered
as 44.36254 or 44 15.3 or 44 16 07

2. You may want to move to the highest nearby spot
to ensure a 360° view:

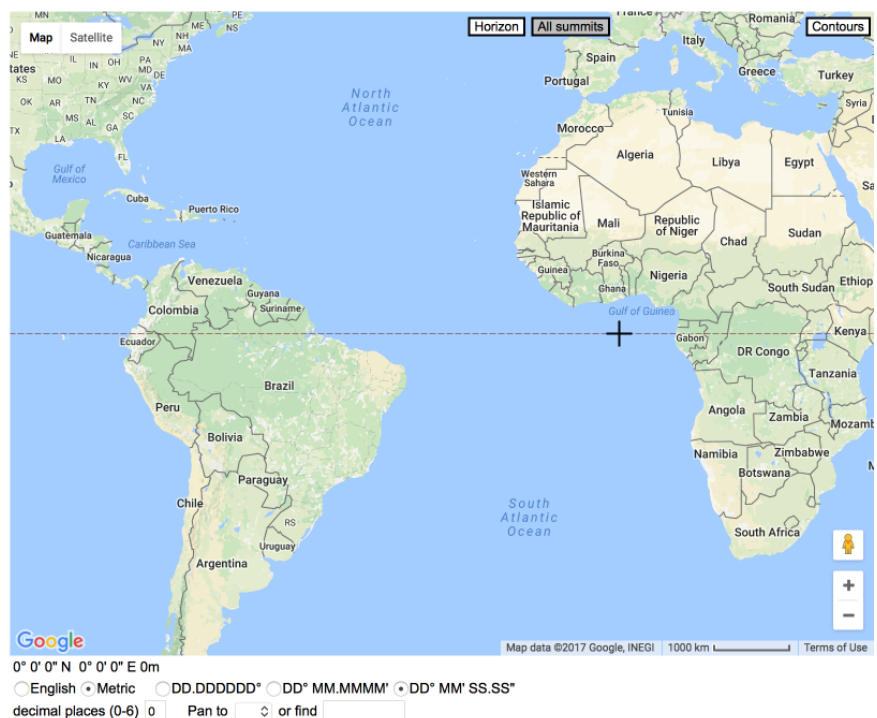
Move to highest point within

3. Specify your elevation or leave blank for
the default (2 meters above ground level):

Elevation meters ☒ above ground
☐ above sea level

4. Enter a title:

Requests are taking about 2 minutes





Just insert your latitude and longitude and a name for the panorama.
Then click Submit Request at the bottom

1. Click on the map ---->

Or search for an address:

e.g. 1600 pennsylvania ave, washington dc
or main & elm, 04843

Find

Or enter your latitude and longitude:

Latitude

Longitude

latitude and longitude can be entered
as 44.36254 or 44 15.3 or 44 16 07

2. You may want to move to the highest nearby spot
to ensure a 360° view:

Move to highest point within

Move

3. Specify your elevation or leave blank for
the default (2 meters above ground level):

Elevation meters ☒ above ground ☐ above sea level

4. Enter a title:

Submit request

Requests are taking about 2 minutes

Cancel



Map data ©2017 Google, INEGI 1000 km Terms of Use

0° 0' 0" N 0° 0' 0" E 0m

☐ English ☒ Metric ☐ DD.DDDDDD° ☐ DD° MM.MMMM' ☒ DD° MM' SS.SS"

decimal places (0-6) 0 Pan to or find



After a maximum of 2 minutes your panorama will appear

After a maximum of 2 minutes your panorama will appear

[All panoramas](#)

[View](#)

Orca da Malhada do Cambarinho

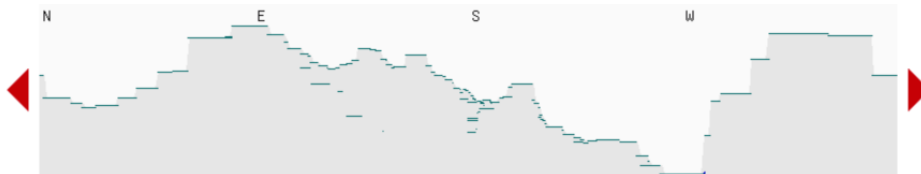
[New panorama](#)

[Print](#)

Orca da Malhada do Cambarinho

latitude 40° 40' 47.64" N longitude 8° 7' 13.8" W
elevation 800m above sea level (2m above ground)
<http://www.heywhatsthat.com/?view=K5JP31AA>

[Email this panorama](#)
[View in Google Earth: day](#)
[night](#)
[Use magnetic north](#)



(vertical scale exaggerated 9.9x)

☐ show 0° and 1° alt

[Hide profile 1](#)

Click on map to see a profile

[Parameters](#)

[Show profile 2](#)



(Bearings are true; for magnetic bearings)

What you need to know is:

[All panoramas](#)

[View](#)

Orca da Malhada do Cambarinho

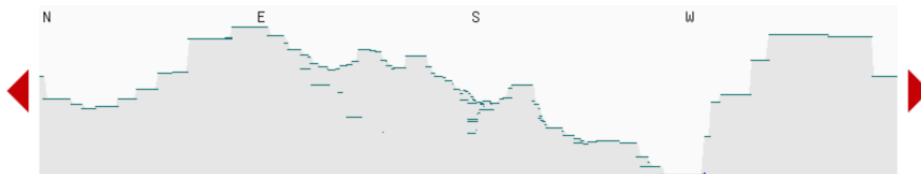
[New panorama](#)

[Print](#)

Orca da Malhada do Cambarinho

latitude 40° 40' 47.64" N longitude 8° 7' 13.8" W
elevation 800m above sea level (2m above ground)
<http://www.heywhatsthat.com/?view=K5JP31AA>

[Email this panorama](#)
[View in Google Earth: day](#)
[night](#)
[Use magnetic north](#)



(vertical scale exaggerated 9.9x)

☐ show 0° and 1° alt

[Hide profile 1](#)

Click on map to see a profile

[Parameters](#)

[Show profile 2](#)



(Bearings are true; for magnetic bearings)

What you need to know is:

heywhatsthat

[WISP tools](#)
[Path profiler](#)
[Sea level rise](#)
[Eclipse simulations](#)
[Site map](#)
[Sign up](#)
[Comments?](#)

[Twitter](#)
[G+](#)
[Facebook](#)
[Like](#)

[All panoramas](#)
[View](#)
Orca da Malhada do Cambarinho
[New panorama](#)
[Print](#)

Orca da Malhada do Cambarinho

latitude 40° 40' 47.64" N longitude 8° 7' 13.8" W

elevation 800m above sea level (2m above ground)

<http://www.heywhatsthat.com/?view=K5JP31AA>

Details of your panorama

[Email this panorama](#)
[View in Google Earth: day](#) [night](#)
[Use magnetic north](#)

(vertical scale exaggerated 9.9x) ☐ show 0° and 1° alt

Click on map to see a profile

[Parameters](#)

[Hide profile 1](#)

[Show profile 2](#)

Map
Satellite

Horizon
All summits
Up in the Air
Visibility cloak
Contours

(Bearings are true; for magnetic bearings)

What you need to know is:

heywhatsthat

[WISP tools](#)
[Path profiler](#)
[Sea level rise](#)
[Eclipse simulations](#)
[Site map](#)
[Sign up](#)
[Comments?](#)

[Twitter](#)
[G+](#)
[Facebook](#)
[Like](#)

[All panoramas](#)
[View](#)
Orca da Malhada do Cambarinho
[New panorama](#)
[Print](#)

Orca da Malhada do Cambarinho

latitude 40° 40' 47.64" N longitude 8° 7' 13.8" W

elevation 800m above sea level (2m above ground)

<http://www.heywhatsthat.com/?view=K5JP31AA>

Link so you can return to it later
Save this in your records!

[Email this panorama](#)
[View in Google Earth: day](#) [night](#)
[Use magnetic north](#)

(vertical scale exaggerated 9.9x) ☐ show 0° and 1° alt

Click on map to see a profile

[Parameters](#)

[Hide profile 1](#)

[Show profile 2](#)

Map
Satellite

Horizon
All summits
Up in the Air
Visibility cloak
Contours

(Bearings are true; for magnetic bearings)

What you need to know is:

heywhatsthat

[WISP tools](#) [Path profiler](#) [Sea level rise](#) [Eclipse simulations](#) [Site map](#) [Sign up](#) [Comments?](#) [Like](#) [\\$](#)

[All panoramas](#) [View](#) Orca da Malhada do Cambarinho [New panorama](#) [Print](#)

Orca da Malhada do Cambarinho
latitude 40° 40' 47.64" N longitude 8° 7' 13.8" W
elevation 800m above sea level (2m above ground)
<http://www.heywhatsthat.com/?view=K5JP31AA>

This code is the HWT ID, it identifies your panorama. Save it for later use (stay tuned!)

[Email this panorama](#)
[View in Google Earth: day](#) [night](#)
[Use magnetic north](#)



(vertical scale exaggerated 9.9x) ☐ show 0° and 1° alt [Hide profile 1](#)

Click on map to see a profile

[Parameters](#)

[Show profile 2](#)

[Map](#) [Satellite](#) [Jssela](#) [Manhouce](#) [Horizon](#) [All summits](#) [Up in the Air](#) [Visibility cloak](#) [Contours](#)

(Bearings are true; for magnetic bearings)

heywhatsthat

What you need to know is:

heywhatsthat

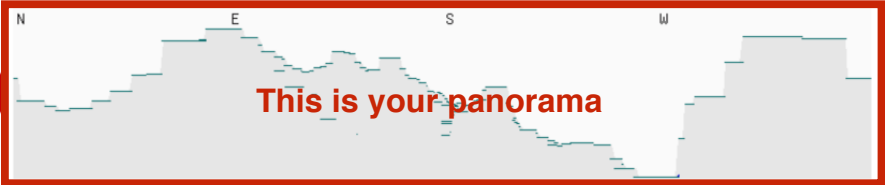
[WISP tools](#) [Path profiler](#) [Sea level rise](#) [Eclipse simulations](#) [Site map](#) [Sign up](#) [Comments?](#) [Like](#) [\\$](#)

[All panoramas](#) [View](#) Orca da Malhada do Cambarinho [New panorama](#) [Print](#)

Orca da Malhada do Cambarinho
latitude 40° 40' 47.64" N longitude 8° 7' 13.8" W
elevation 800m above sea level (2m above ground)
<http://www.heywhatsthat.com/?view=K5JP31AA>

This is your panorama

[Email this panorama](#)
[View in Google Earth: day](#) [night](#)
[Use magnetic north](#)



(vertical scale exaggerated 9.9x) ☐ show 0° and 1° alt [Hide profile 1](#)

Click on map to see a profile

[Parameters](#)

[Show profile 2](#)

[Map](#) [Satellite](#) [Jssela](#) [Manhouce](#) [Horizon](#) [All summits](#) [Up in the Air](#) [Visibility cloak](#) [Contours](#)

(Bearings are true; for magnetic bearings)

What you need to know is:

heywhatsthat

[WISP tools](#)
[Path profiler](#)
[Sea level rise](#)
[Eclipse simulations](#)
[Site map](#)
[Sign up](#)
[Comments?](#)

[Twitter](#)
[G+](#)
[Facebook](#)
[Like](#)

[All panoramas](#)
[View](#)
Orca da Malhada do Cambarinho
[New panorama](#)
[Print](#)

Orca da Malhada do Cambarinho
latitude 40° 40' 47.64" N longitude 8° 7' 13.8" W
elevation 800m above sea level (2m above ground)
<http://www.heywhatsthat.com/?view=K5JP31AA>

[Email this panorama](#)
[View in Google Earth: day](#)
[night](#)
[Use magnetic north](#)

Notice this:

(vertical scale exaggerated 9.9x)

☐ show 0° and 1° alt

You can change it here: <http://heywhatsthat.com/exaggerate.html>

Hide profile 1

Click on map to see a profile

[Parameters](#)

Show profile 2

[Map](#)
[Satellite](#)

[Horizon](#)
[All summits](#)
[Up in the Air](#)
[Visibility cloak](#)
[Contours](#)

(Bearings are true; for magnetic bearings)

What you need to know is:

heywhatstthat

[WISP tools](#)
[Path profiler](#)
[Sea level rise](#)
[Eclipse simulations](#)
[Site map](#)
[Sign up](#)
[Comments?](#)

[Twitter](#)
[G+](#)
[Facebook](#)
[Like](#)

[All panoramas](#)
[View](#)
Orca da Malhada do Cambarinho
[New panorama](#)
[Print](#)

Orca da Malhada do Cambarinho
latitude 40° 40' 47.64" N longitude 8° 7' 13.8" W
elevation 800m above sea level (2m above ground)
[http://www.heywhatstthat.com/?view=K5JP31AA](http://www.heywhatsthat.com/?view=K5JP31AA)

[Email this panorama](#)
[View in Google Earth: day](#)
[night](#)
[Use magnetic north](#)

If you hover with your mouse you see the azimuth and altitude of where the mouse is

(vertical scale exaggerated 9.9x)

☐ show 0° and 1° alt

Hide profile 1

Click on map to see a profile

[Parameters](#)

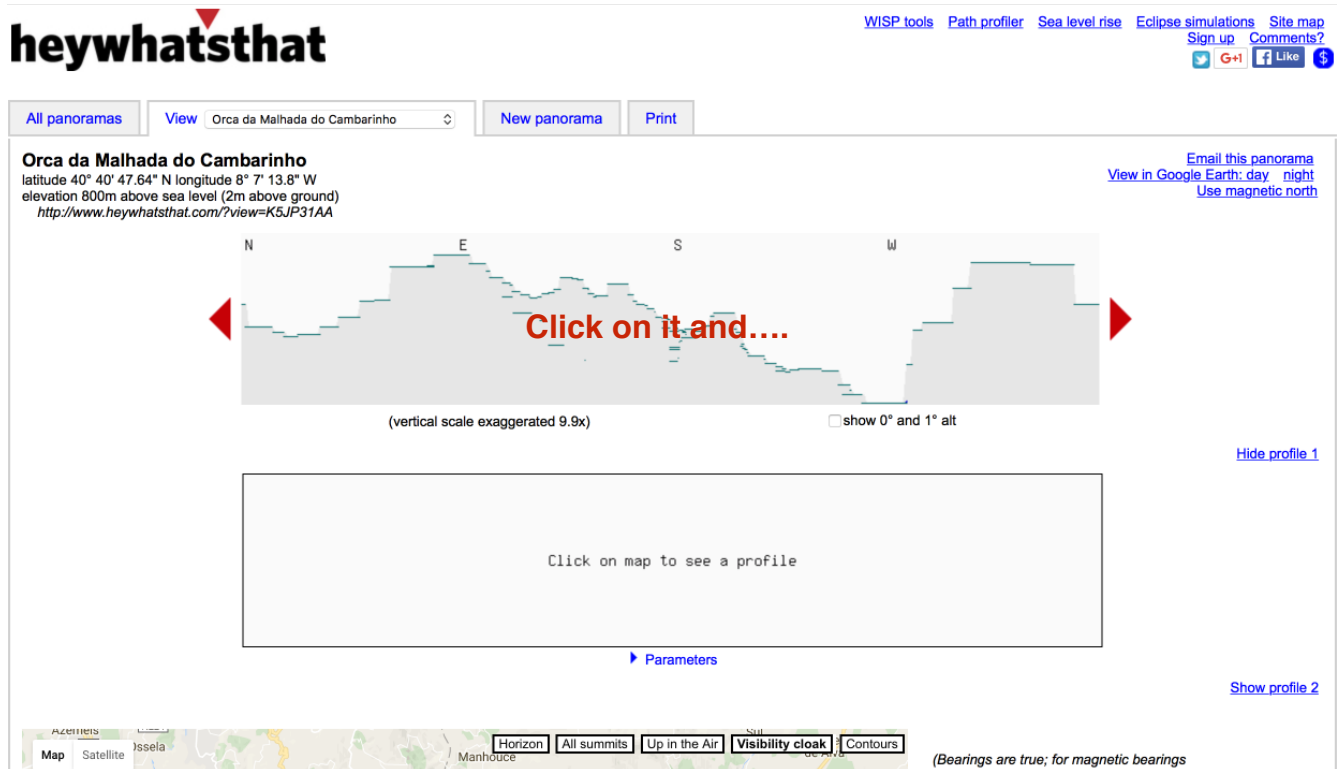
Show profile 2

[Map](#)
[Satellite](#)

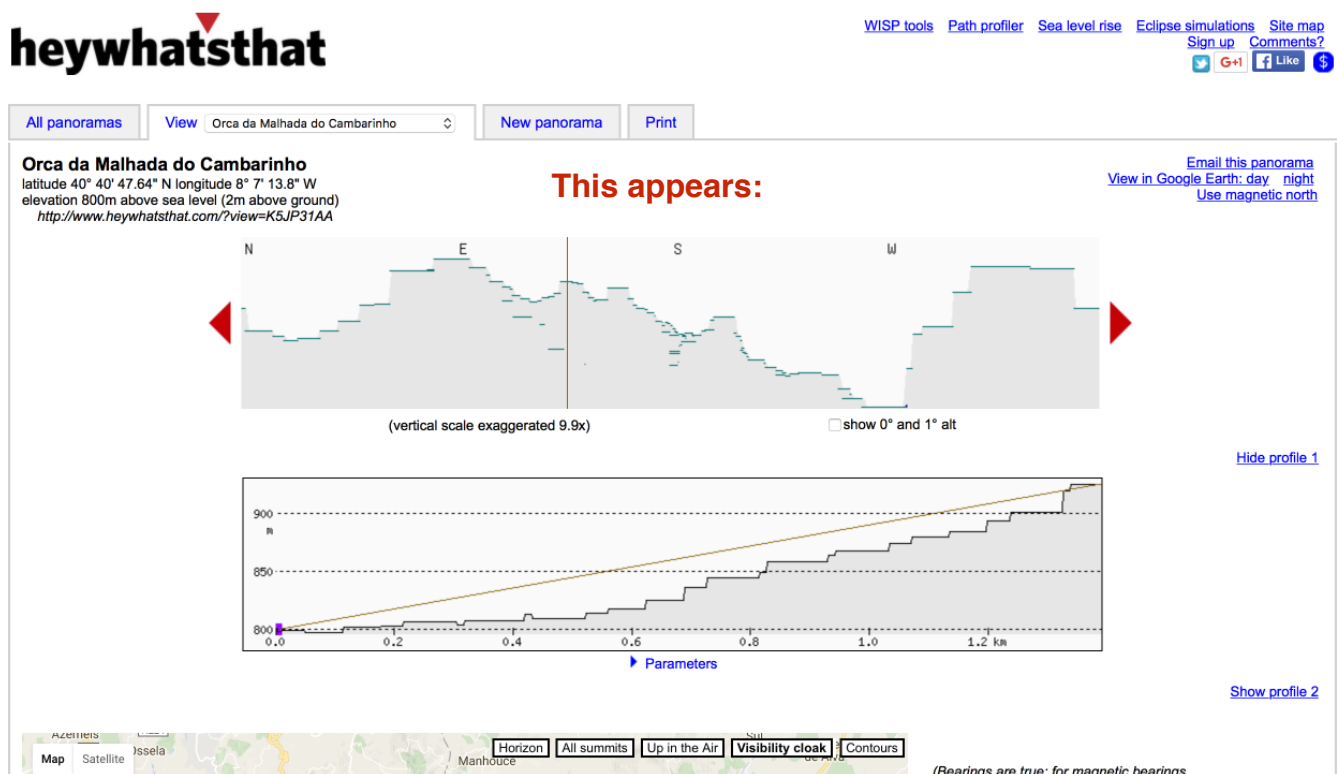
[Horizon](#)
[All summits](#)
[Up in the Air](#)
[Visibility cloak](#)
[Contours](#)

(Bearings are true; for magnetic bearings)

What you need to know is:



What you need to know is:



What you need to know is:

All panoramas

View

Orca da Malhada do Cambarinho

New panorama

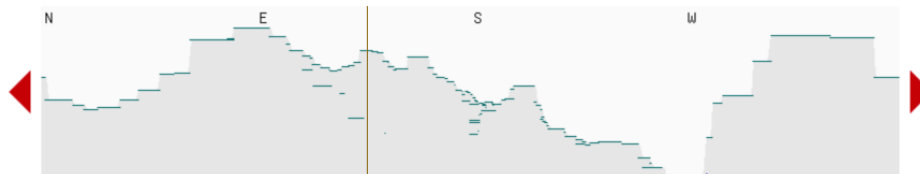
Print

Orca da Malhada do Cambarinho

latitude 40° 40' 47.64" N longitude 8° 7' 13.8" W
 elevation 800m above sea level (2m above ground)
<http://www.heywhatsthat.com/?view=K5JP31AA>

Then scroll down to the bottom

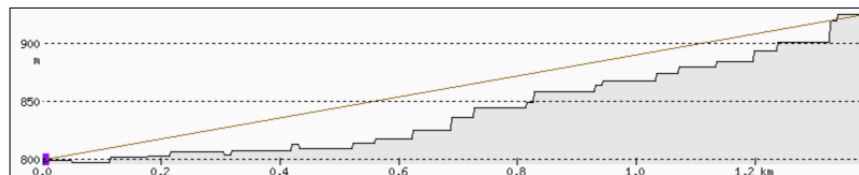
[Email this panorama](#)
[View in Google Earth: day](#)
[night](#)
[Use magnetic north](#)



(vertical scale exaggerated 9.9x)

☐ show 0° and 1° alt

[Hide profile 1](#)



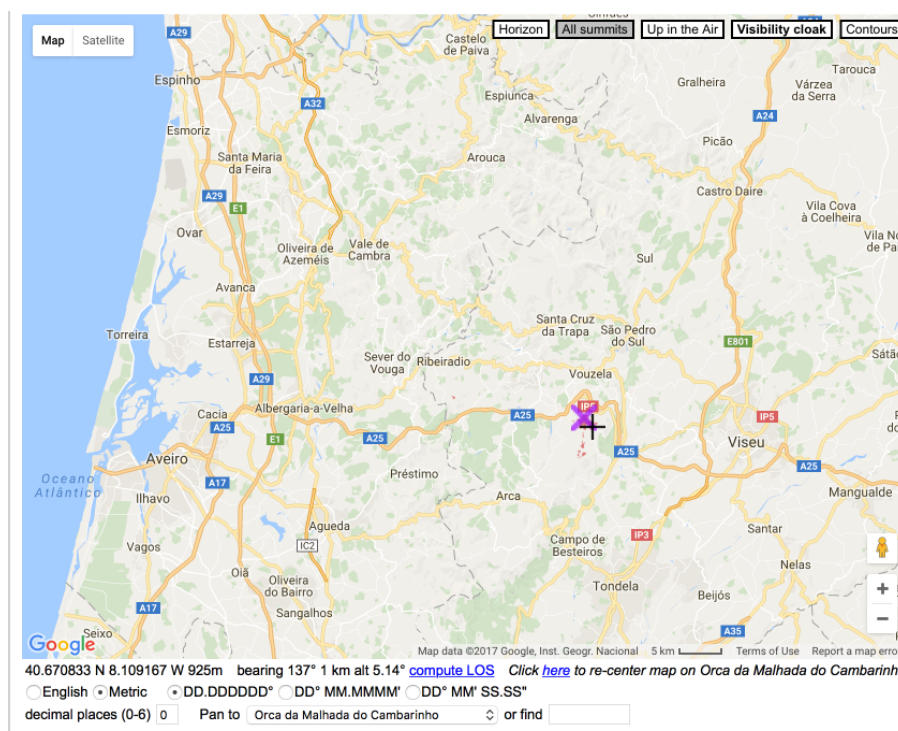
Parameters

[Show profile 2](#)



(Bearings are true; for magnetic bearings

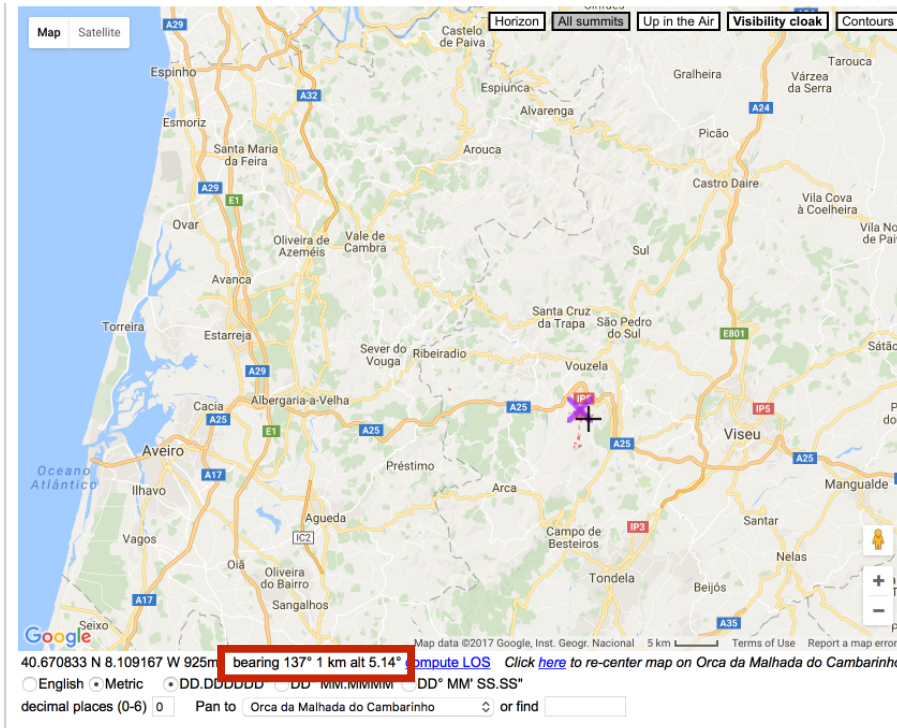
What you need to know is:



(Bearings are true; for magnetic bearings
 add 3° or click [here](#))
☐ show alt

40.670833 N 8.109167 W 925m bearing 137° 1 km alt 5.14° [compute LOS](#) Click [here](#) to re-center map on Orca da Malhada do Cambarinho
 English Metric DD.DDDDD° DD° MM.MMMM' DD° MM' SS.SS"
 decimal places (0-6) 0 Pan to Orca da Malhada do Cambarinho or find

What you need to know is:



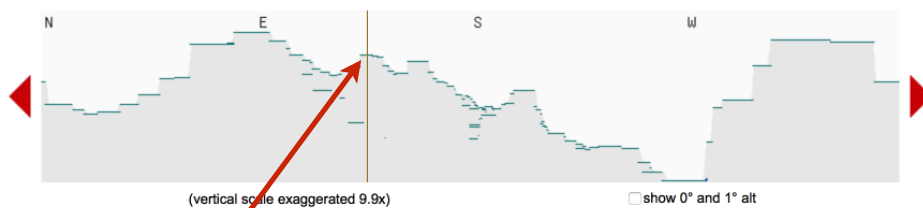
(Bearings are true; for magnetic bearings add 3° or click [here](#))
☐ show alt

This is the azimuth (“bearing”) and horizon altitude of where you clicked in the panorama

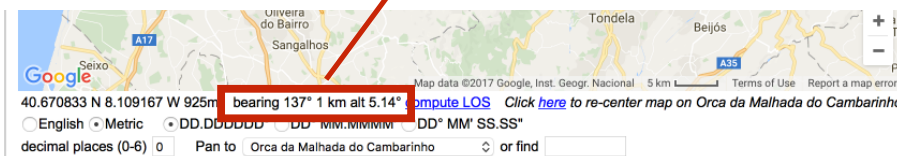
What you need to know is:

Orca da Malhada do Cambarinho
 latitude 40° 40' 47.64" N longitude 8° 7' 13.8" W
 elevation 800m above sea level (2m above ground)
<http://www.heywhatsthat.com/?view=K5JP31AA>

[Email this panorama](#)
[View in Google Earth: day night](#)
[Use magnetic north](#)



[Slide number 4](#)

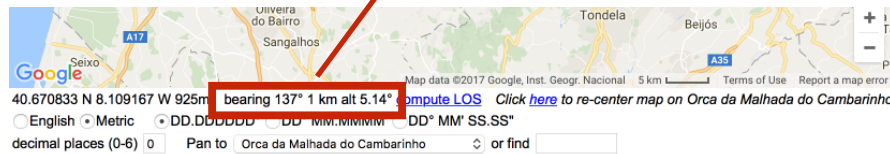
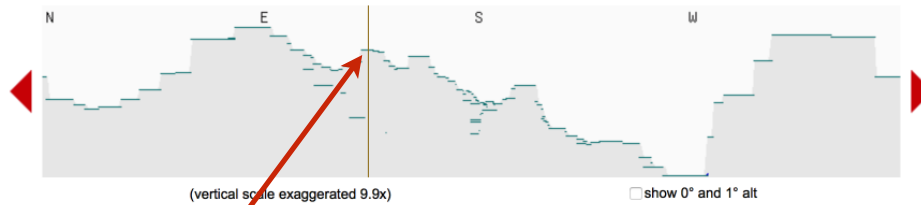


This is the azimuth (“bearing”) and horizon altitude of where you clicked in the panorama

What you need to know is:

Orca da Malhada do Cambarinho
latitude 40° 40' 47.64" N longitude 8° 7' 13.8" W
elevation 800m above sea level (2m above ground)
<http://www.heywhatsthat.com/?view=K5JP31AA>

[Email this panorama](#)
[View in Google Earth: day night](#)
[Use magnetic north](#)



This is the azimuth
("bearing") and horizon
altitude of where you
clicked in the panorama

To download a panorama (e.g. to put it in your essay) go to:

<http://www.heywhatsthat.com/pans.html> and use the HWT ID you saved previously

HWT is not perfect: it works best for distant horizons and worst for near ones.

As general rule-of-thumb I'd regard any horizon that is 300-900m away with caution. Below 300m with suspicion and below 100m as automatically wrong. This is because of the resolution of the data HWT uses (~90m resolution).

For more information see Victor Reijs' (an MA alumni) comparison of different software here:

<http://www.archaeocosmology.org/eng/skylineprofilescomparing.htm>

skyscapeR v0.3b

v0.3.7 (08 IV 2017)

<https://app.skyscaper.net>

skyscapeR v0.3b



skyscapeR (pronounced *sky-scaper*) is an online app focused on the visualization and analysis of archaeoastronomical data.

It is built in *R* using *RStudio* and *Shiny*. It also uses the *R* packages *astrolibR* and *palinsol* for its astronomical calculations.



<https://www.r-project.org/>



<https://www.rstudio.com>



<https://shiny.rstudio.com>

It is run on an Amazon Web Services E2 Compute Cloud server.

It is optimised (thanks to *Shiny*) to run on any device (desktops, laptops, tablets and phones)!

This is still under construction: help pages, more information and more modules will be added later. You are all part of the closed beta testing programme. If the site is offline, if something isn't clear, if something doesn't work or if you'd like some facility to be added, email me!!

This is the main page. It shows the typical panels that are found throughout *skyscapeR*:

skyscapeR v0.3b
About
Data Entry
Visualization
Horizon
Tools
Help

Welcome to the skyscapeR app

v0.3.6 (02 III 2017) – beta build

skyscapeR is an online app focused on the visualization and analysis of archaeoastronomical data. It is built in *R* using *RStudio* and *Shiny*. It also uses the *R* packages *astrolibR* and *palinsol* for its astronomical calculations.

This is still under construction: help pages, more information and more modules will be added later.

© Fabio Silva 2016

Sophia Centre
MA Cultural Astronomy and Astrology
School of Archaeology, History and Anthropology
University of Wales Trinity Saint David
Lampeter



Prifysgol Cymru
Y Drindod Dewi Sant
University of Wales
Trinity Saint David



This is the main page. It shows the typical panels that are found throughout *skyscapeR*:

skyscapeR v0.3b
About
Data Entry
Visualization
Horizon
Tools
Help

Welcome to the skyscapeR app

v0.3.6 (02 III 2017) – beta build

skyscapeR is an online app focused on the visualization and analysis of archaeoastronomical data. It is built in *R* using *RStudio* and *Shiny*. It also uses the *R* packages *astrolibR* and *palinsol* for its astronomical calculations.

This is still under construction: help pages, more information and more modules will be added later.

© Fabio Silva 2016

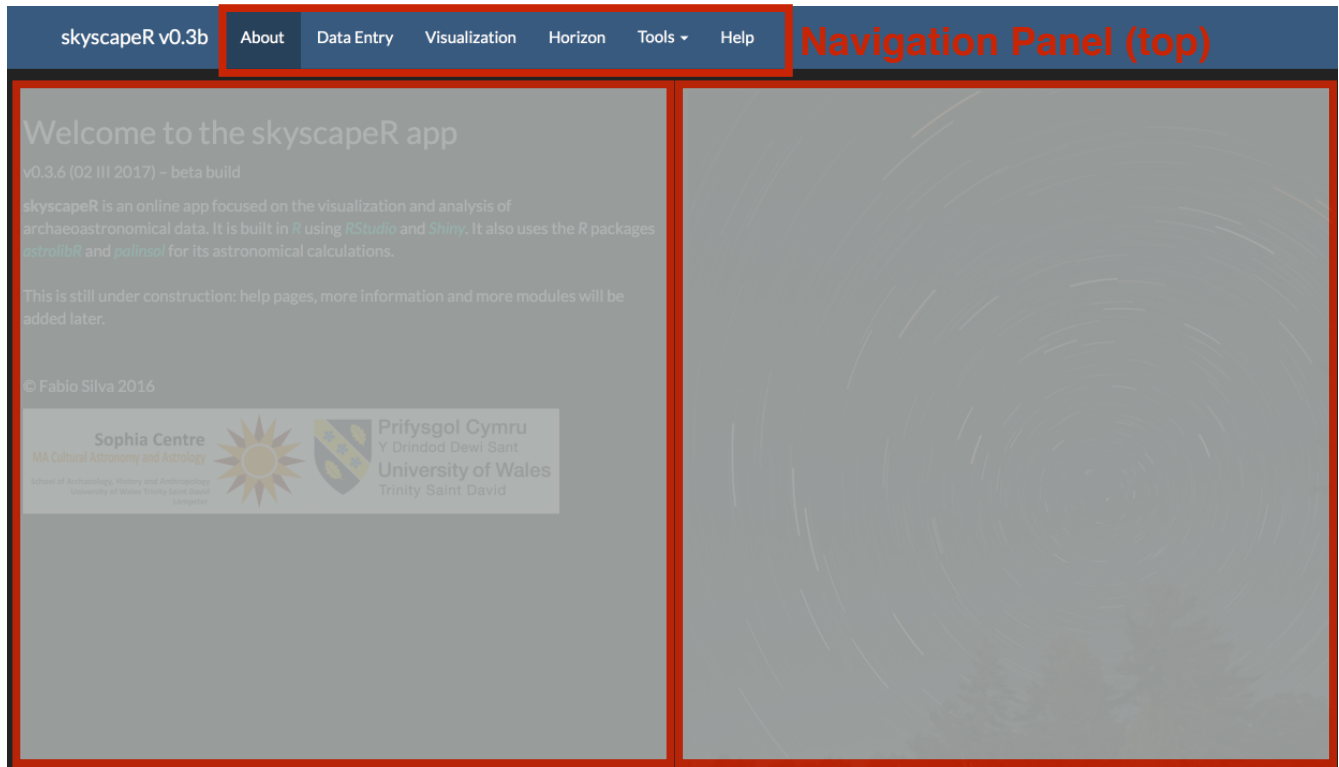
Sophia Centre
MA Cultural Astronomy and Astrology
School of Archaeology, History and Anthropology
University of Wales Trinity Saint David
Lampeter



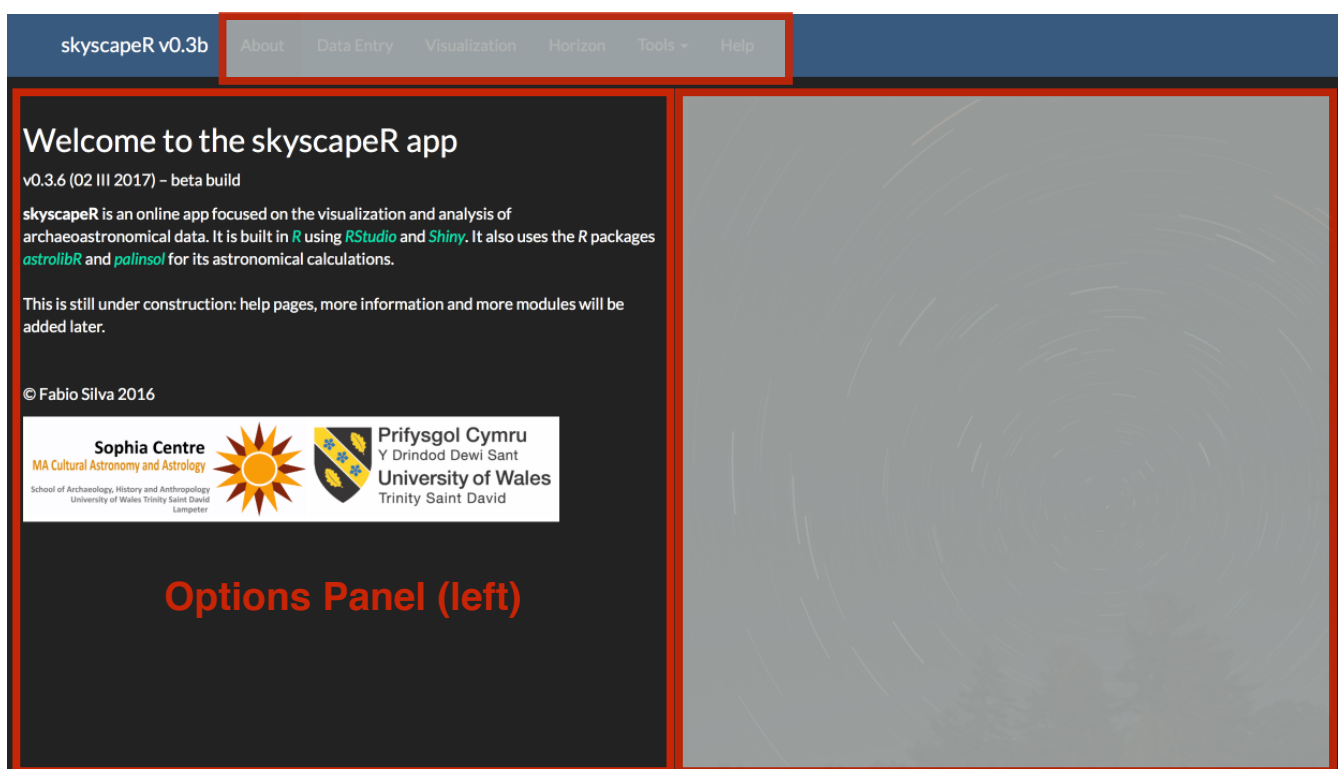
Prifysgol Cymru
Y Drindod Dewi Sant
University of Wales
Trinity Saint David



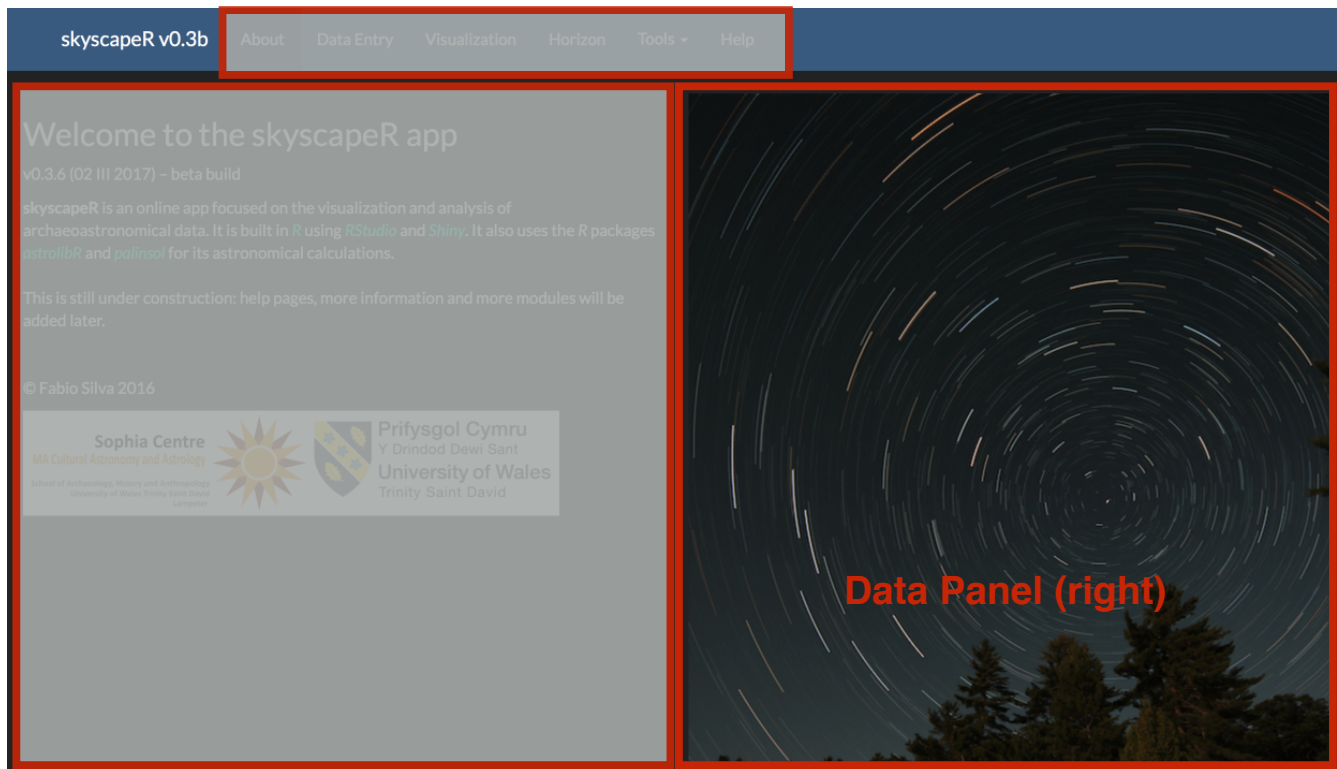
This is the main page. It shows the typical panels that are found throughout *skyscapeR*:



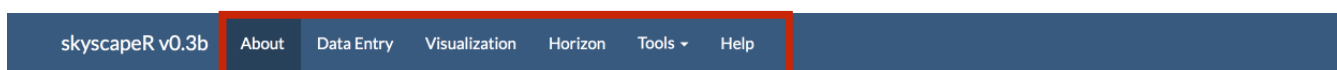
This is the main page. It shows the typical panels that are found throughout *skyscapeR*:



This is the main page. It shows the typical panels that are found throughout *skyscapeR*:



The Navigation panel shows the different *Modules* (or pages) that are available.



Data Entry: allows users to either: a) choose a published dataset, which is useful to learn how to use the app, or b) upload their own field data

Visualization: allows for visualization of the data entered as a) data points, b) a histogram and/or c) a curvigram

Horizon: allows the user to download a previously created HeyWhatThat panorama into skyscapeR and display orbits of celestial objects, as well as measurements on top of it

Tools: smaller apps to assist the skyscape researcher

Help: a help page — out-of-date and will be replaced by this pdf soon!!

The Data Entry module

skyscapeR v0.3b About **Data Entry** Visualization Horizon Tools ▾ Help

This is the Data Entry page

skyscapeR v0.3b About **Data Entry** Visualization Horizon Tools ▾ Help

Data Entry

In this page you can choose a dataset from the literature or upload your own data (please use the provided template).

Choose from a published dataset

none ▾

or Upload your own Data

Browse...

No file selected

Note : Make sure the datafile follows the template which can be downloaded [here](#)

Then move on to the 'Visualization' tab

data

Please upload or select a dataset

This is the Data Entry page

skyscapeR v0.3b
About
Data Entry
Visualization
Horizon
Tools
Help

Navigation Panel (top)

Data Entry

In this page you can choose a dataset from the literature or upload your own data (please use the provided template).

Choose from a published dataset

none

or Upload your own Data

Browse...
No file selected

Note : Make sure the datafile follows the template which can be downloaded [here](#)

Then move on to the 'Visualization' tab

Options Panel (left)

data

Please upload or select a dataset

Data Panel (right)

Lets take a closer look at the Options Panel

skyscapeR v0.3b
About
Data Entry
Visualization
Horizon
Tools
Help

Data Entry

In this page you can choose a dataset from the literature or upload your own data (please use the provided template).

Choose from a published dataset

none

or Upload your own Data

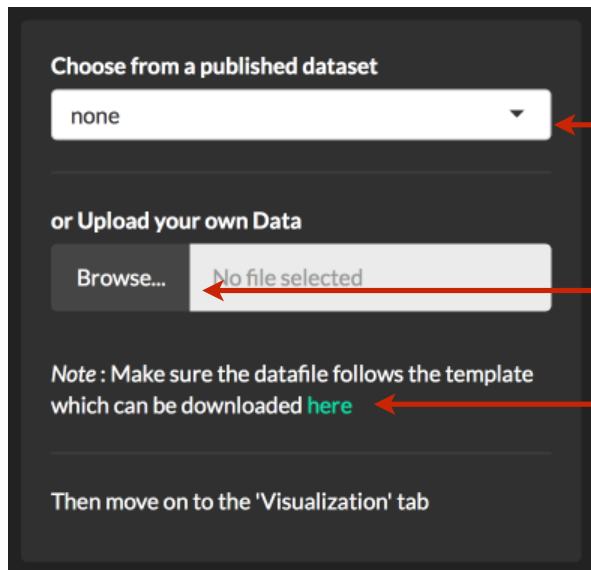
Browse...
No file selected

Note : Make sure the datafile follows the template which can be downloaded [here](#)

Then move on to the 'Visualization' tab

Options Panel (left)

This is the Options Panel for the Data Entry module. With it you can:



Choose from a published dataset

none

or Upload your own Data

Browse... No file selected

Note : Make sure the datafile follows the template which can be downloaded [here](#)

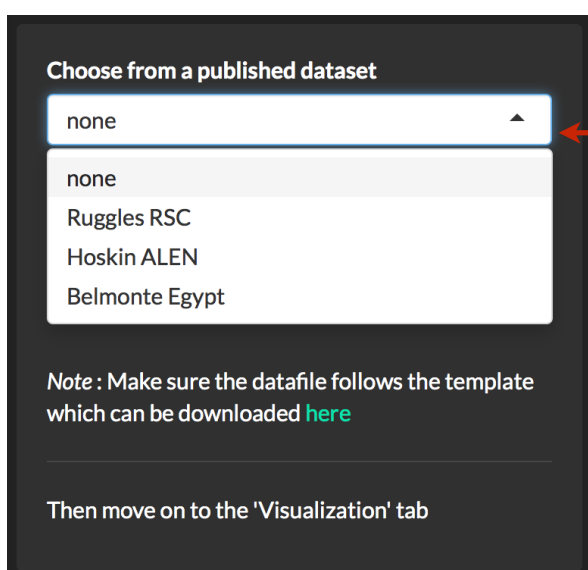
Then move on to the 'Visualization' tab

Choose a pre-existing dataset

Upload your data

Download a data template

This is the Options Panel for the Data Entry module. With it you can:



Choose from a published dataset

none

none

Ruggles RSC

Hoskin ALEN

Belmonte Egypt

Note : Make sure the datafile follows the template which can be downloaded [here](#)

Then move on to the 'Visualization' tab

Choose a pre-existing dataset

- 1) Scottish Recumbent Stone Circle (RSC) data from Ruggles 1999
- 2) Alentejan (ALEN) Seven-Stone *Anta* data from Hoskin 2001
- 3) Egyptian Temple data from Belmonte and Shaltout 2009

These datasets include only declinations (so you can't display them on the Horizon module, for which azimuths and altitudes are needed, as we will see later)

When you click on one of these, the Data panel (right side) will display the data

When you click on a dataset, the Data panel will display the data. You can scroll down to see it all.

skyscapeR v0.3b
About
Data Entry
Visualization
Horizon
Tools
Help

Data Entry

In this page you can choose a dataset from the literature or upload your own data (please use the provided template).

Choose from a published dataset

Ruggles RSC

or Upload your own Data

Browse...

No file selected

Note : Make sure the datafile follows the template which can be downloaded [here](#)

Then move on to the 'Visualization' tab

Name	Dec
RSC5	-19.40
RSC6	-31.60
RSC7	-29.40
RSC11	-30.80
RSC12	-32.20
RSC17	-32.20
RSC20	-31.60
RSC23	-24.80
RSC24	-31.20
RSC25	-31.80
RSC37	-29.00
RSC39	-31.00
RSC47	-30.80
RSC48	-30.20
RSC49	-26.80
RSC54	-32.60

Data Panel (right)

To upload your own data the process is slightly different:

To upload your own data the process is slightly different:

Choose from a published dataset

none

▼

or Upload your own Data

Browse...

No file selected

Note : Make sure the datafile follows the template which can be downloaded [here](#)

Then move on to the 'Visualization' tab

First, download the data template

Then move on to the 'Visualization' tab

The data template is a spreadsheet you can open with Microsoft Excel, Apple Numbers or Google Docs. It looks like this:

[illegible]

The data template is a spreadsheet you can open with Microsoft Excel, Apple Numbers or Google Docs. It looks like this:

ID	Name	Lat	Lon	Az	Az.Unc	Alt	Alt.Unc	Notes
1	Example 1	35.45	-8.67	110	10	3	0.5	This is an example of the data you can include.

ID: a number or code to identify each measurement

Name: a label to identify each measurement (e.g. name of site)

Lat: latitude of site

Lon: longitude of site

these need to be in decimal point format, with negative sign for S latitudes and W longitudes

Az: true azimuth

Az.Unc: uncertainty in azimuth (currently unused)

Alt: horizon altitude

Alt.Unc: uncertainty in altitude (currently unused)

Notes: any text

Fill it with your own data (use the Tools module if necessary) and save it somewhere where you will remember later

ID	Name	Lat	Lon	Az	Az.Unc	Alt	Alt.Unc	Notes
1	Orca da Malhada do Cambarinho	40.6799	-8.1205	111.75		4.9		HWT ID = K5JP31AA
2	Dolmen da Lapa de Meruje	40.6409	-8.1393889	88.5		7.5		HWT ID = P5PN2V3O
3	Orca dos Juncals	40.8161	-7.7307222	76		2.5		HWT ID = R88VKAU4
4	Orca de Pendilhe	40.89811	-7.8237	126		2		HWT ID = T8QDTKU3

Note that I left the Uncertainty fields empty (which is okay since they are unused for now) and put the previously created HeyWhatsThat ID in the Notes field

To upload your own data the process is slightly different:

Choose from a published dataset

none

or Upload your own Data

Browse...

No file selected

Note : Make sure the datafile follows the template which can be downloaded [here](#)

Then move on to the 'Visualization' tab

Then, click on Browse

Go to the folder where you placed the spreadsheet and click on it

This is what you should see

skyscapeR v0.3b
About
Data Entry
Visualization
Horizon
Tools
Help

Data Entry

In this page you can choose a dataset from the literature or upload your own data (please use the provided template).

Choose from a published dataset

none

or Upload your own Data

Browse...

template.csv

Upload complete

Note : Make sure the datafile follows the template which can be downloaded [here](#)

Then move on to the 'Visualization' tab

ID	Name	Lat	Lon	Az	Az.Unc	Alt	Alt.Unc	Notes	Dec
1	Orca da Malhada do Cambarinho	40.68	-8.12	111.75	NA	4.90	NA	HWT ID = K5JP31AA	-13.08
2	Dolmen da Lapa de Meruje	40.64	-8.14	88.50	NA	7.50	NA	HWT ID = P5PN2V3O	5.94
3	Orca dos Juncals	40.82	-7.73	76.00	NA	2.50	NA	HWT ID = R88VKAU4	12.03
4	Orca de Pendilhe	40.90	-7.82	126.00	NA	2.00	NA	HWT ID = T8QDTKU3	-25.13

This is what you should see

skyscapeR v0.3b
About
Data Entry
Visualization
Horizon
Tools
Help

Data Entry

In this page you can choose a dataset from the literature or upload your own data (please use the provided template).

Choose from a published dataset

none

or Upload your own Data

Browse... template.csv

Upload complete

Note : Make sure the data file follows the template which can be downloaded [here](#)

Then move on to the 'Visualization' tab

ID	Name	Lat	Lon	Az	Az.Unc	Alt	Alt.Unc	Notes	Dec
1	Orca da Malhada do Cambarinho	40.68	-8.12	111.75	NA	4.90	NA	HWT ID = K5JP31AA	-13.08
2	Dolmen da Lapa de Meruje	40.64	-8.14	88.50	NA	7.50	NA	HWT ID = P5PN2V3O	5.94
3	Orca dos Juncals	40.82	-7.73	76.00	NA	2.50	NA	HWT ID = R88VKAU4	12.03
4	Orca de Pendilhe	40.90	-7.82	126.00	NA	2.00	NA	HWT ID = T8QDTKU3	-25.13

Your data should be displayed in this panel

This says 'Upload complete'

This is what you should see

skyscapeR v0.3b
About
Data Entry
Visualization
Horizon
Tools
Help

Data Entry

In this page you can choose a dataset from the literature or upload your own data (please use the provided template).

Choose from a published dataset

none

or Upload your own Data

Browse... template.csv

Upload complete

Note : Make sure the data file follows the template which can be downloaded [here](#)

Then move on to the 'Visualization' tab

ID	Name	Lat	Lon	Az	Az.Unc	Alt	Alt.Unc	Notes	Dec
1	Orca da Malhada do Cambarinho	40.68	-8.12	111.75	NA	4.90	NA	HWT ID = K5JP31AA	-13.08
2	Dolmen da Lapa de Meruje	40.64	-8.14	88.50	NA	7.50	NA	HWT ID = P5PN2V3O	5.94
3	Orca dos Juncals	40.82	-7.73	76.00	NA	2.50	NA	HWT ID = R88VKAU4	12.03
4	Orca de Pendilhe	40.90	-7.82	126.00	NA	2.00	NA	HWT ID = T8QDTKU3	-25.13

Your data should be displayed in this panel

If something went wrong, there will be an error here instead of this table. In which case email me and attach your spreadsheet file

This says 'Upload complete'

This is what you should see

skyscapeR v0.3b
About
Data Entry
Visualization
Horizon
Tools
Help

Data Entry

In this page you can choose a dataset from the literature or upload your own data (please use the provided template).

Choose from a published dataset

none

or Upload your own Data

Browse...

template.csv

Upload complete

Note : Make sure the datafile follows the template which can be downloaded [here](#)

Then move on to the 'Visualization' tab

ID	Name	Lat	Lon	Az	Az.Unc	Alt	Alt.Unc	Notes	Dec
1	Orca da Malhada do Cambarinho	40.68	-8.12	111.75	NA	4.90	NA	HWT ID = K5JP31AA	-13.08
2	Dolmen da Lapa de Meruje	40.64	-8.14	88.50	NA	7.50	NA	HWT ID = P5PN2V3O	5.94
3	Orca dos Juncals	40.82	-7.73	76.00	NA	2.50	NA	HWT ID = R88VKAU4	12.03
4	Orca de Pendilhe	40.90	-7.82	126.00	NA	2.00	NA	HWT ID = T8QDTKU3	-25.13

Note that the Declination was automatically calculated for you

You can now move on to the Visualisation module

skyscapeR v0.3b
About
Data Entry
Visualization
Horizon
Tools
Help

Data Entry

In this page you can choose a dataset from the literature or upload your own data (please use the provided template).

Choose from a published dataset

none

or Upload your own Data

Browse...

template.csv

Upload complete

Note : Make sure the datafile follows the template which can be downloaded [here](#)

Then move on to the 'Visualization' tab

ID	Name	Lat	Lon	Az	Az.Unc	Alt	Alt.Unc	Notes	Dec
1	Orca da Malhada do Cambarinho	40.68	-8.12	111.75	NA	4.90	NA	HWT ID = K5JP31AA	-13.08
2	Dolmen da Lapa de Meruje	40.64	-8.14	88.50	NA	7.50	NA	HWT ID = P5PN2V3O	5.94
3	Orca dos Juncals	40.82	-7.73	76.00	NA	2.50	NA	HWT ID = R88VKAU4	12.03
4	Orca de Pendilhe	40.90	-7.82	126.00	NA	2.00	NA	HWT ID = T8QDTKU3	-25.13

The Visualisation module

skyscapeR v0.3b About Data Entry Visualization Horizon Tools ▾ Help

This is the Data Visualisation page

skyscapeR v0.3b About Data Entry Visualization Horizon Tools ▾ Help

Data Visualization

In this page you can visualize the data selected in the 'Data Entry' page.

Plot Style

☒ Data Points

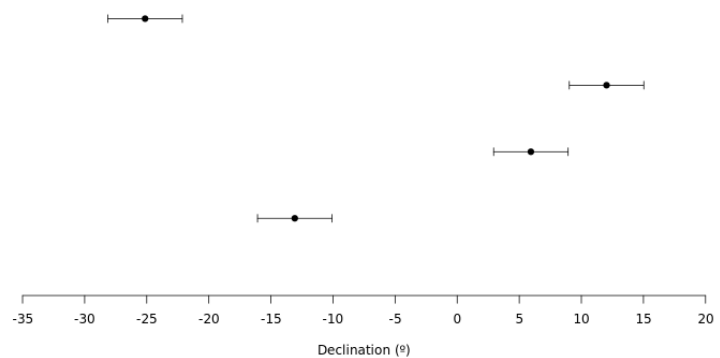
Uncertainty

3

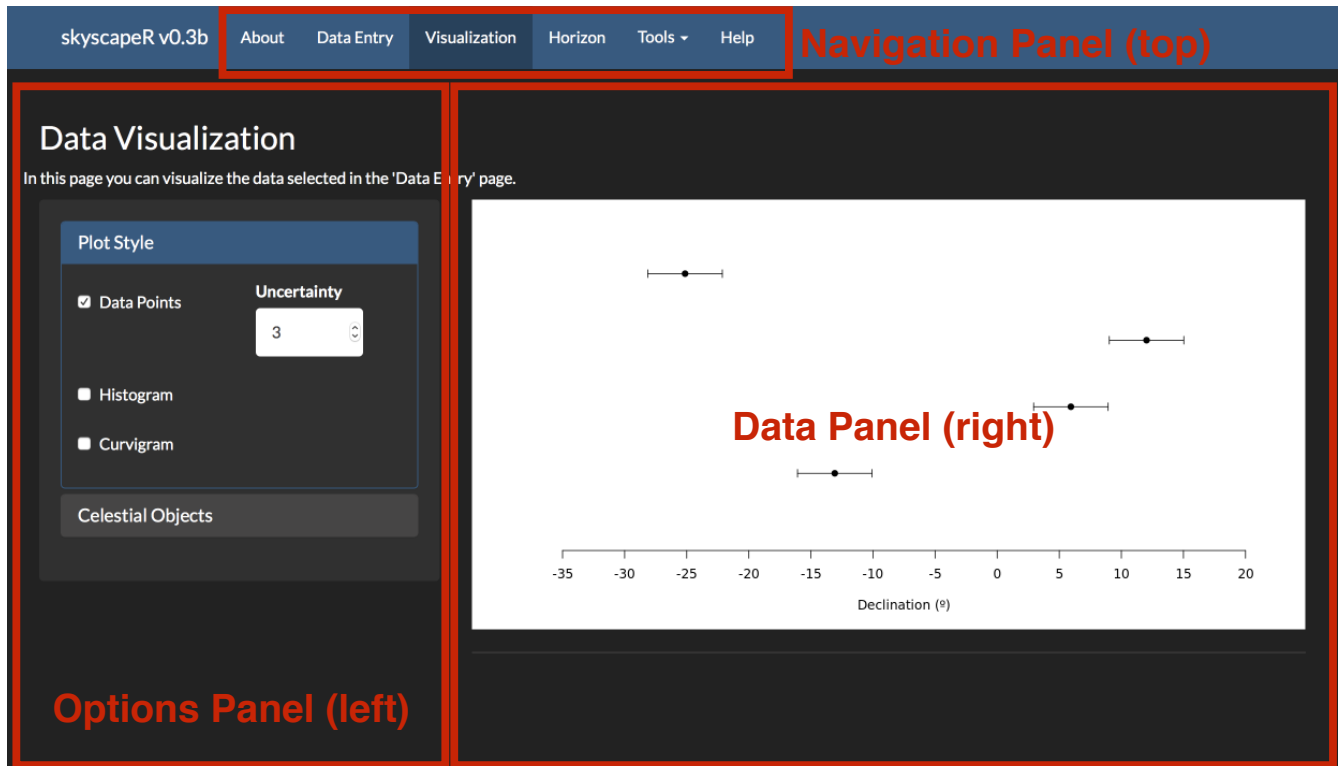
☐ Histogram

☐ Curvigram

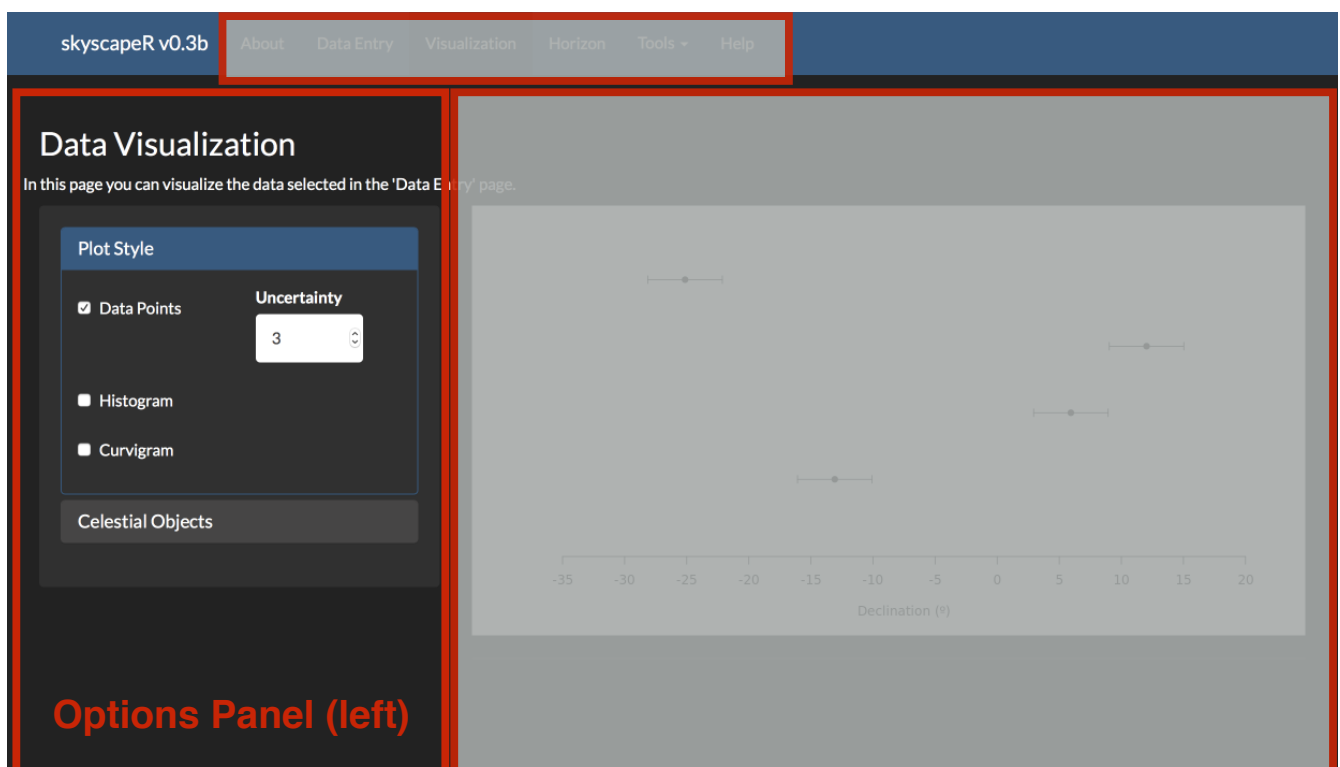
Celestial Objects



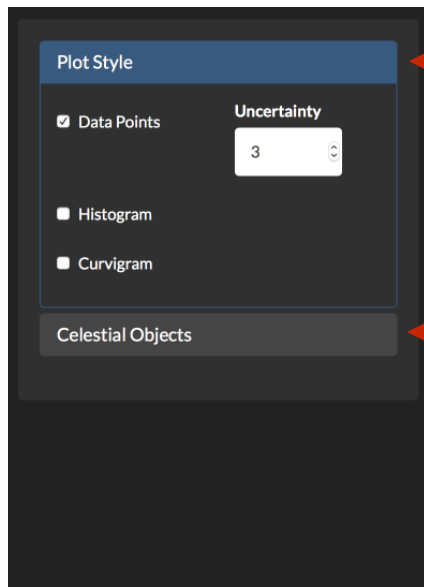
This is the Data Visualisation page



Lets take a closer look at the Options Panel



Lets take a closer look at the Options Panel

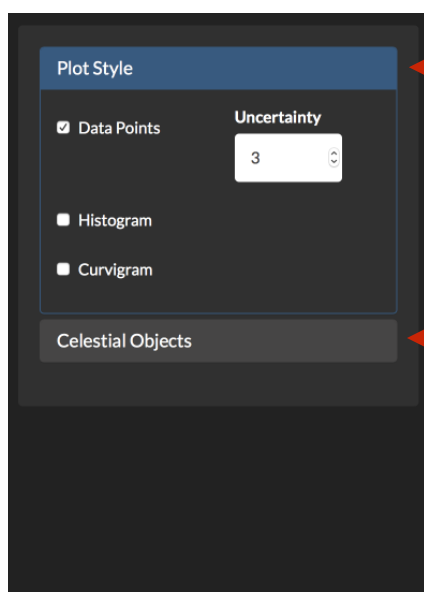


This is a collapsible panel

This is a collapsible panel

Meaning that you can click on them to open or close them

Lets take a closer look at the Options Panel

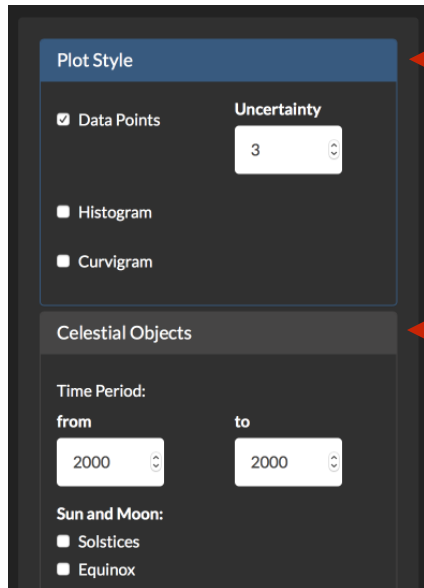


This is an open collapsible panel

This is a closed collapsible panel

Meaning that you can click on them to open or close them

Lets take a closer look at the Options Panel



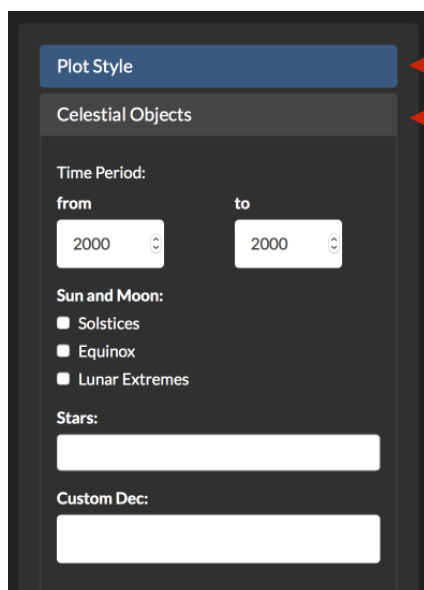
The screenshot shows the 'Plot Style' section of the Options Panel. It contains a checked checkbox for 'Data Points', a numeric input field for 'Uncertainty' set to 3, and unchecked checkboxes for 'Histogram' and 'Curvigram'. Below this is the 'Celestial Objects' section, which is currently collapsed. It includes a 'Time Period' section with 'from' and 'to' date pickers both set to 2000, and a 'Sun and Moon' section with unchecked checkboxes for 'Solstices' and 'Equinox'.

This is an open collapsible panel

This is now open

Meaning that you can click on them to open or close them

Lets take a closer look at the Options Panel



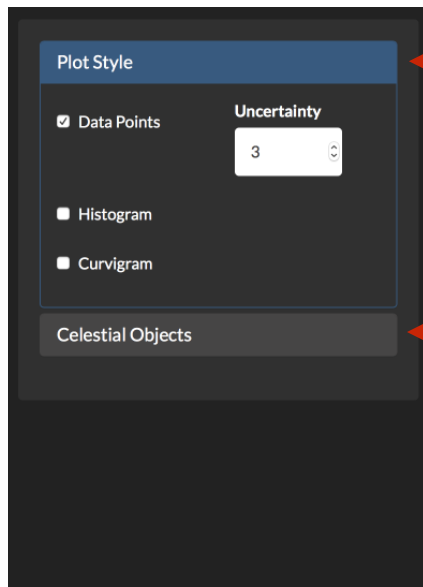
The screenshot shows the 'Plot Style' section of the Options Panel, which is now collapsed. The 'Celestial Objects' section is expanded, showing the 'Time Period' section with 'from' and 'to' date pickers both set to 2000, and a 'Sun and Moon' section with unchecked checkboxes for 'Solstices', 'Equinox', and 'Lunar Extremes'. Below this is a 'Stars' section with an empty text input field, and a 'Custom Dec' section with an empty text input field.

This is now closed

This is open

Meaning that you can click on them to open or close them

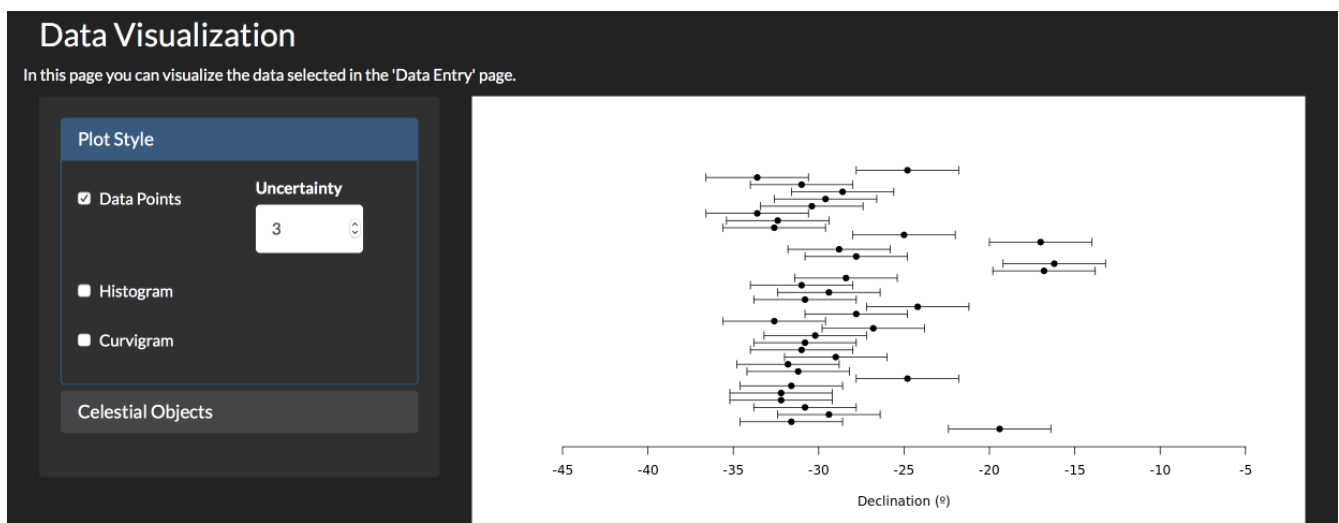
Lets take a closer look at the Options Panel



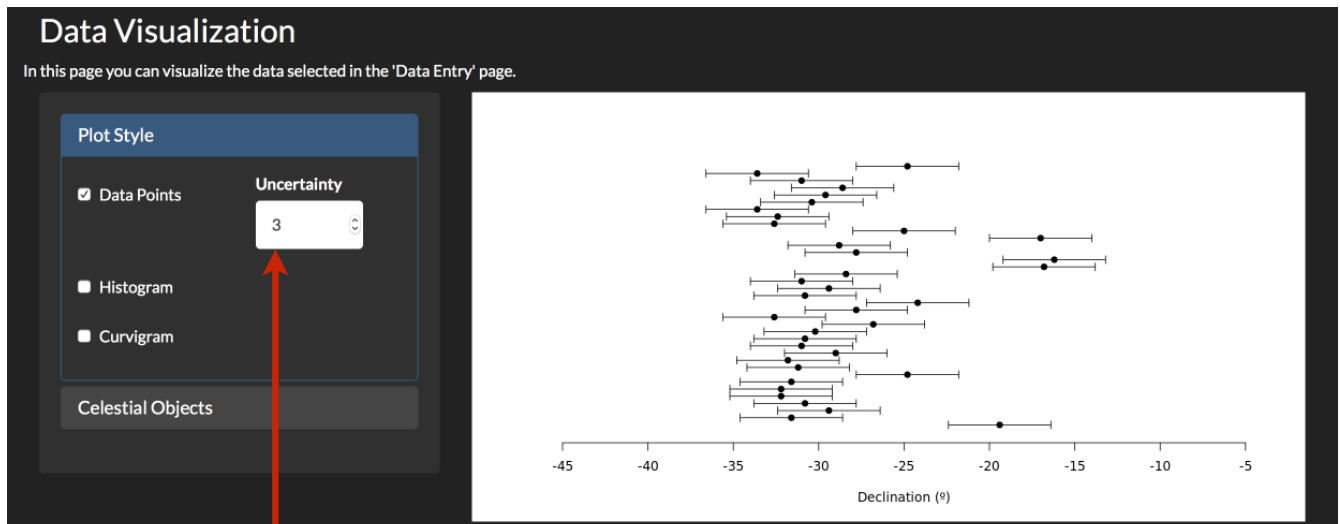
This lets you choose what visualisation style you want

This lets you display celestial objects on top of your data

This is what the **Data Points** style looks like

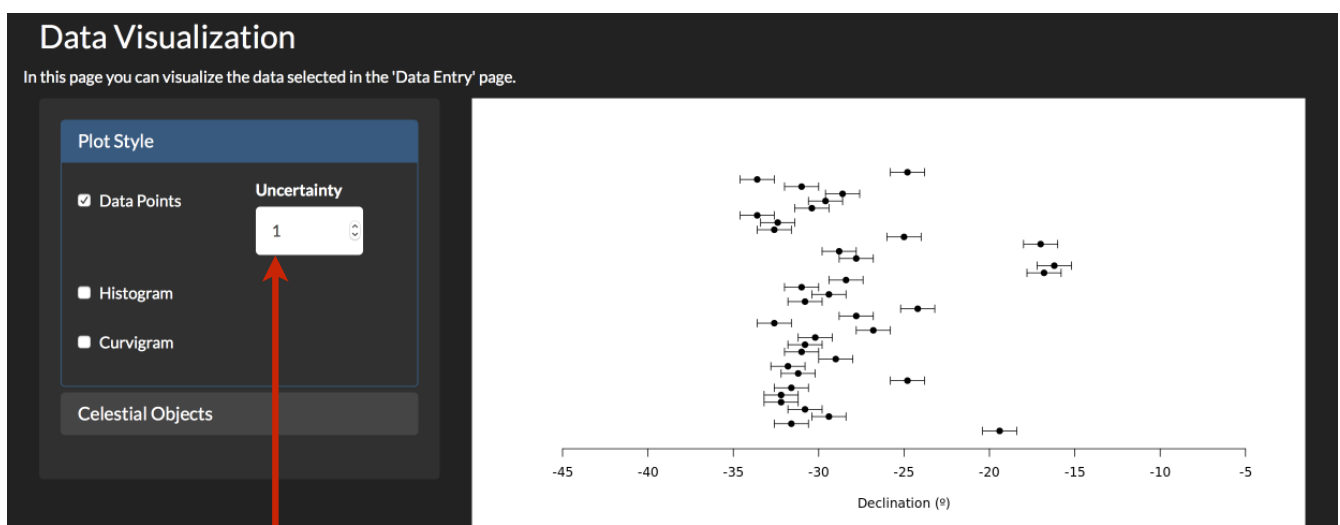


This is what the **Data Points** style looks like



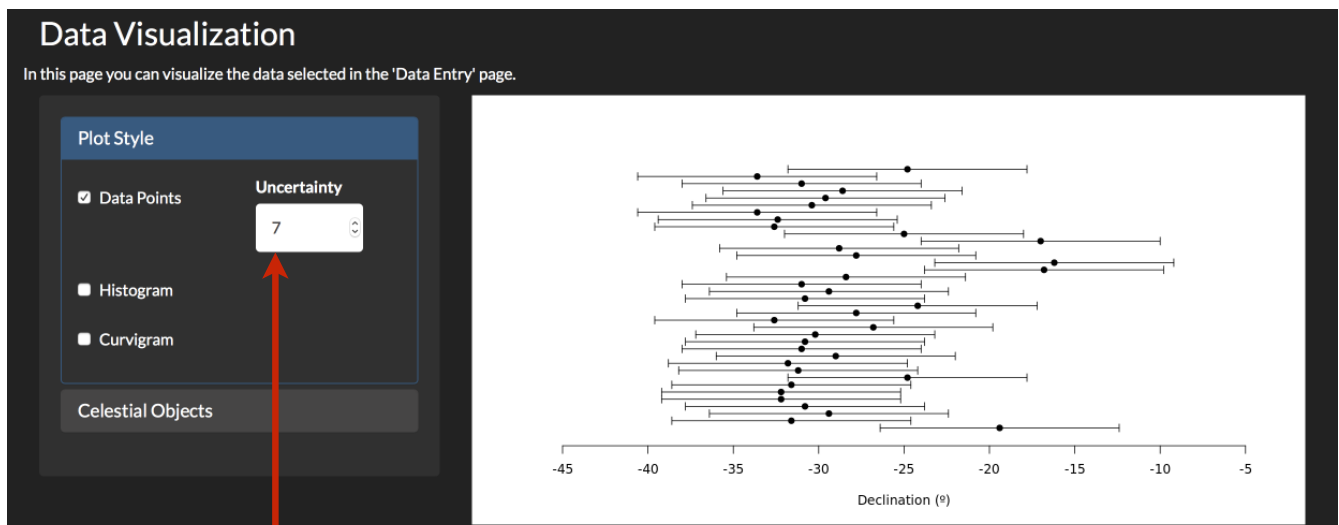
Uncertainty controls the size of the error bar of all measurements

This is what the **Data Points** style looks like



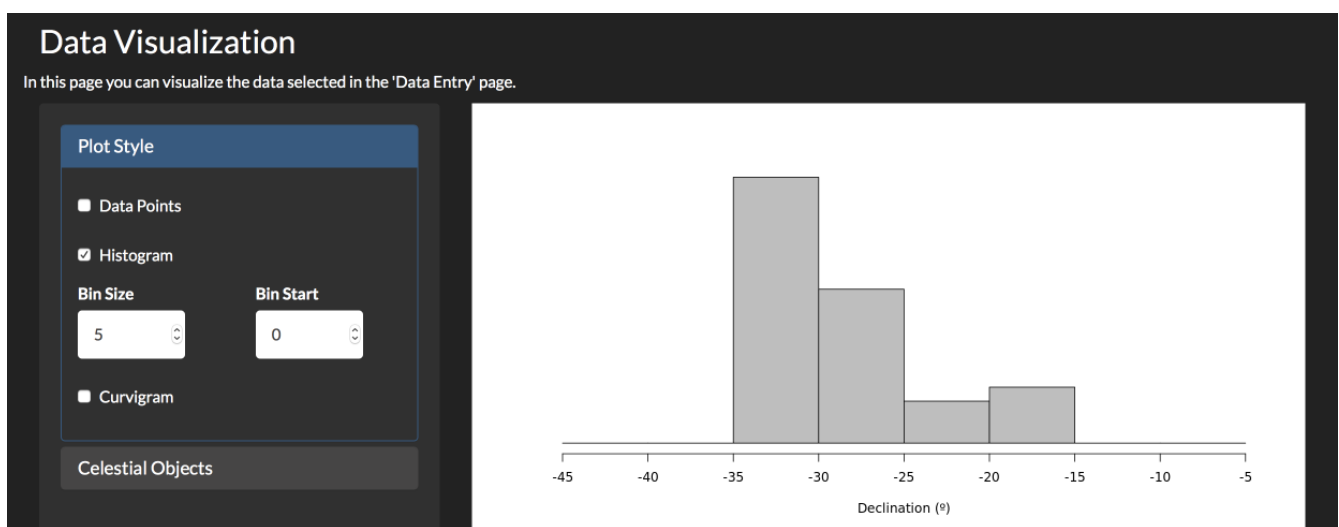
Uncertainty controls the size of the error bar of all measurements

This is what the **Data Points** style looks like

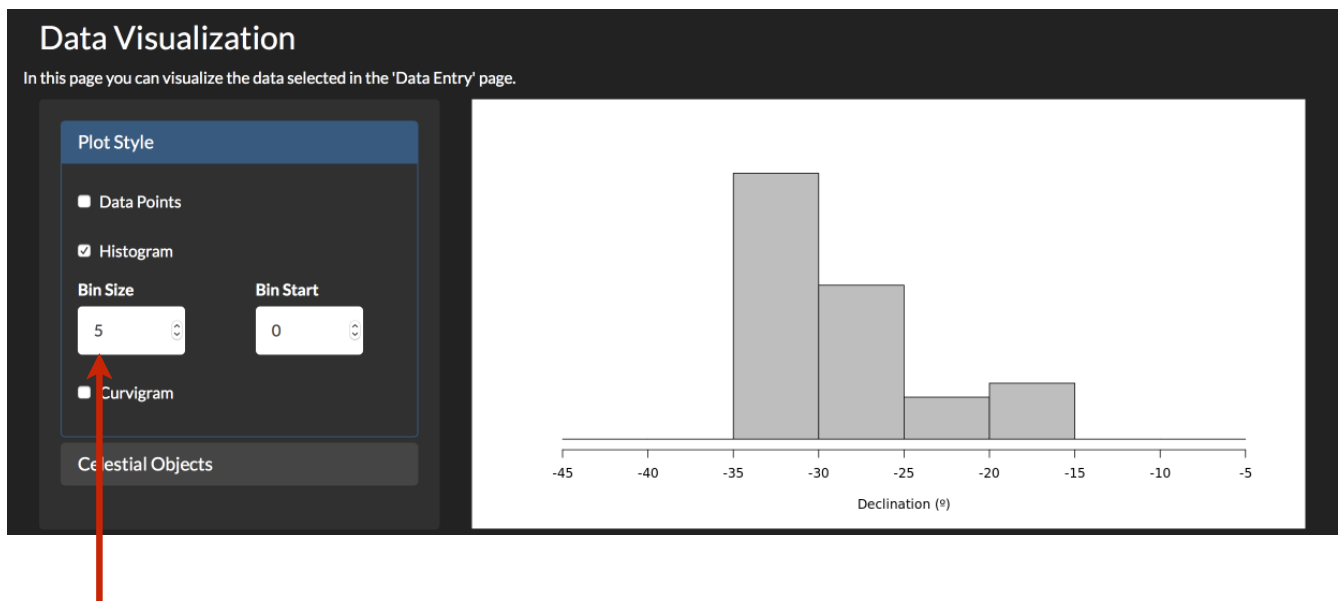


Uncertainty controls the size of the error bar of all measurements

This is what the **Histogram** style looks like

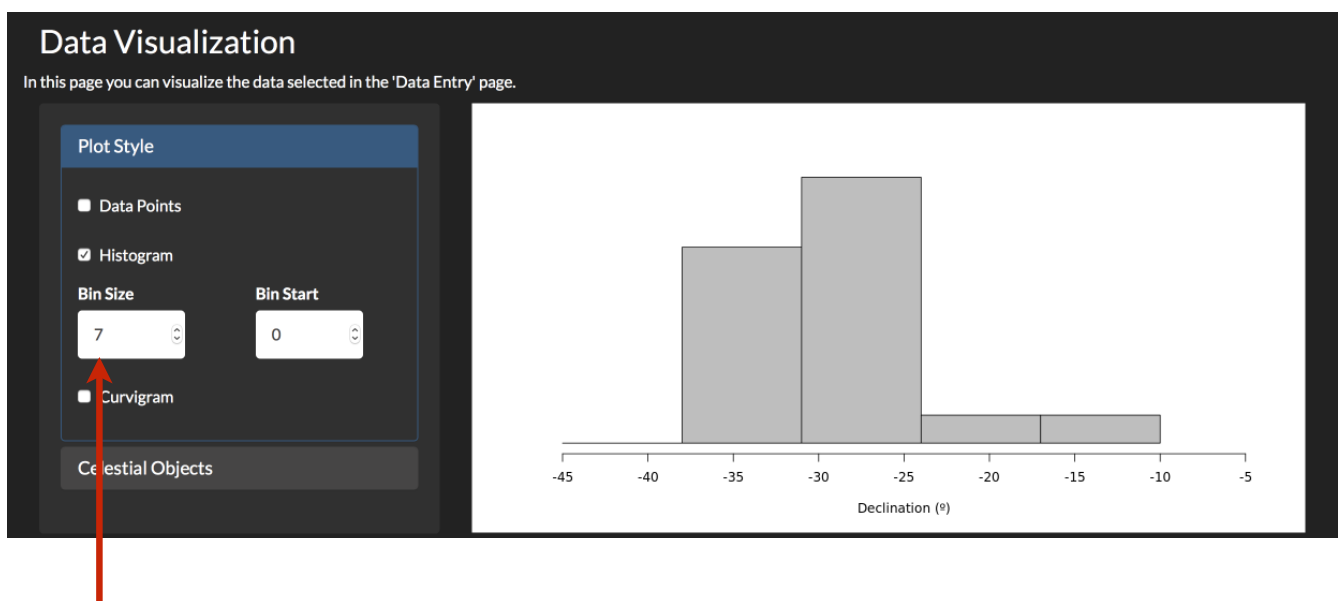


This is what the **Histogram** style looks like



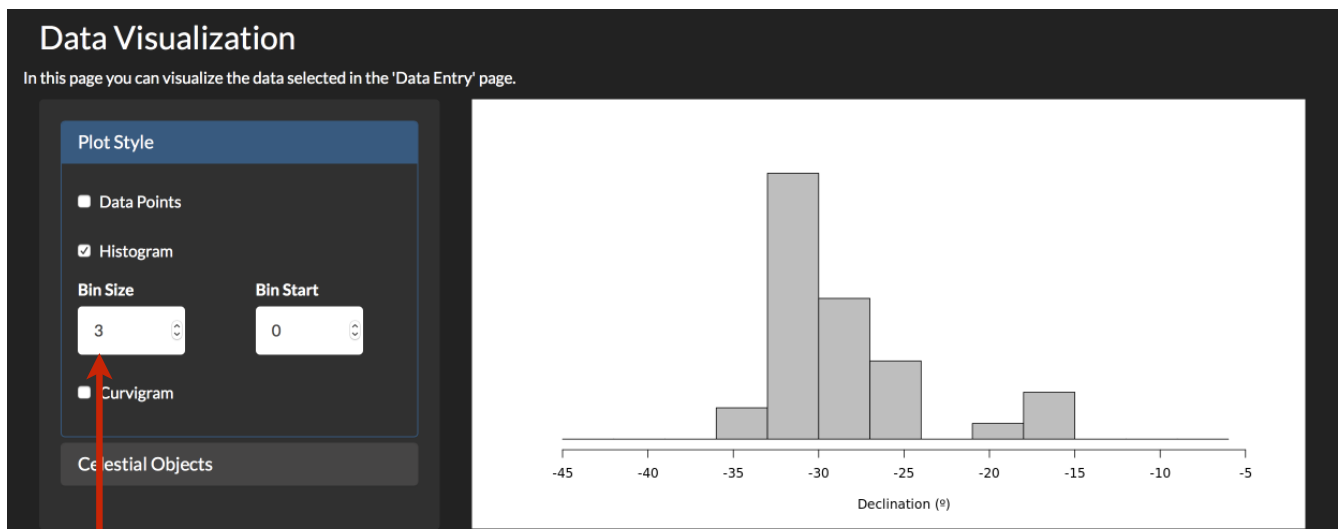
Bin size controls the width of each bar (which should be related to the uncertainty)

This is what the **Histogram** style looks like



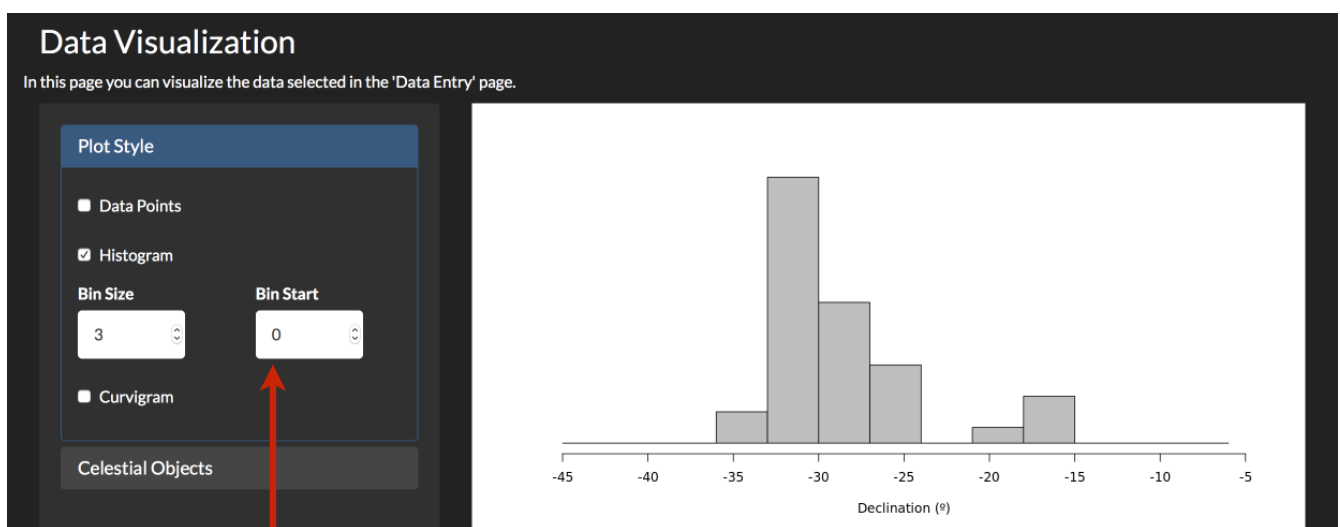
Bin size controls the width of each bar (which should be related to the uncertainty)

This is what the **Histogram** style looks like



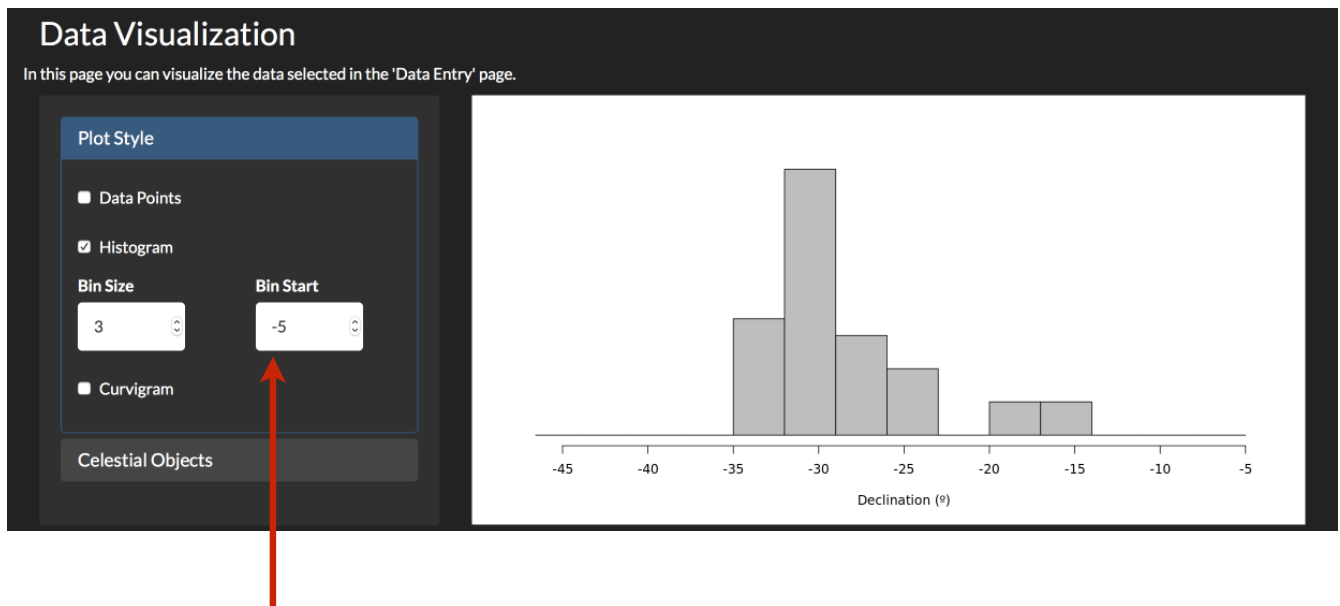
Bin size controls the width of each bar (which should be related to the uncertainty)

This is what the **Histogram** style looks like



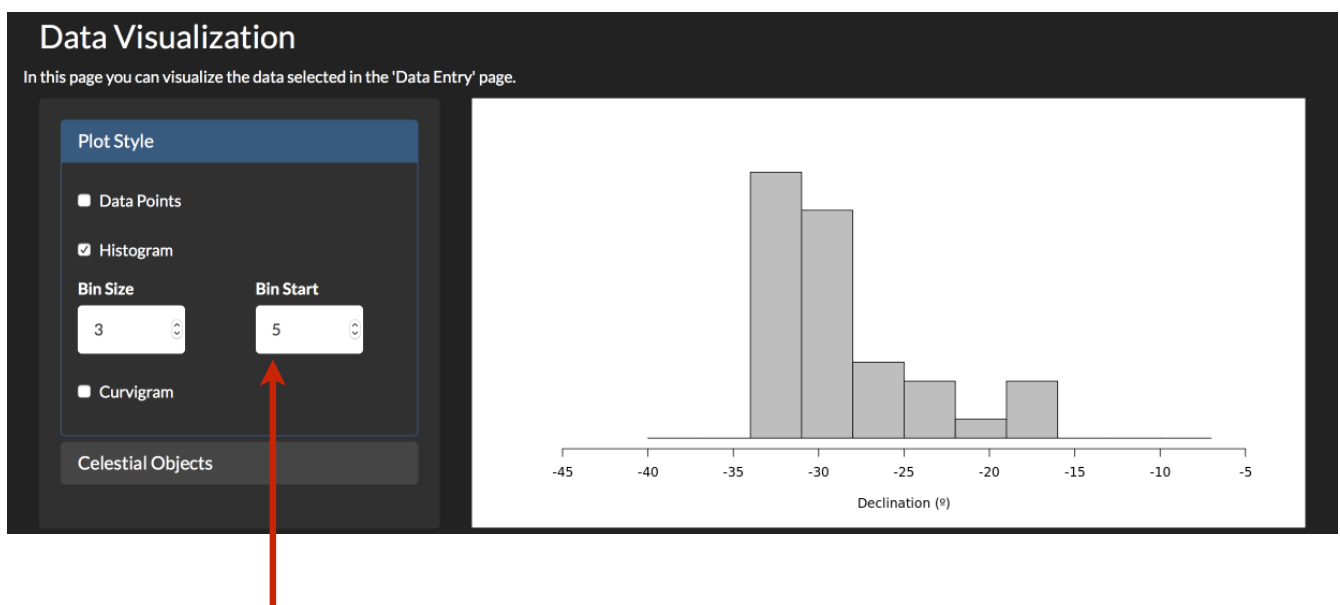
Bin Starts controls where each bar starts

This is what the **Histogram** style looks like



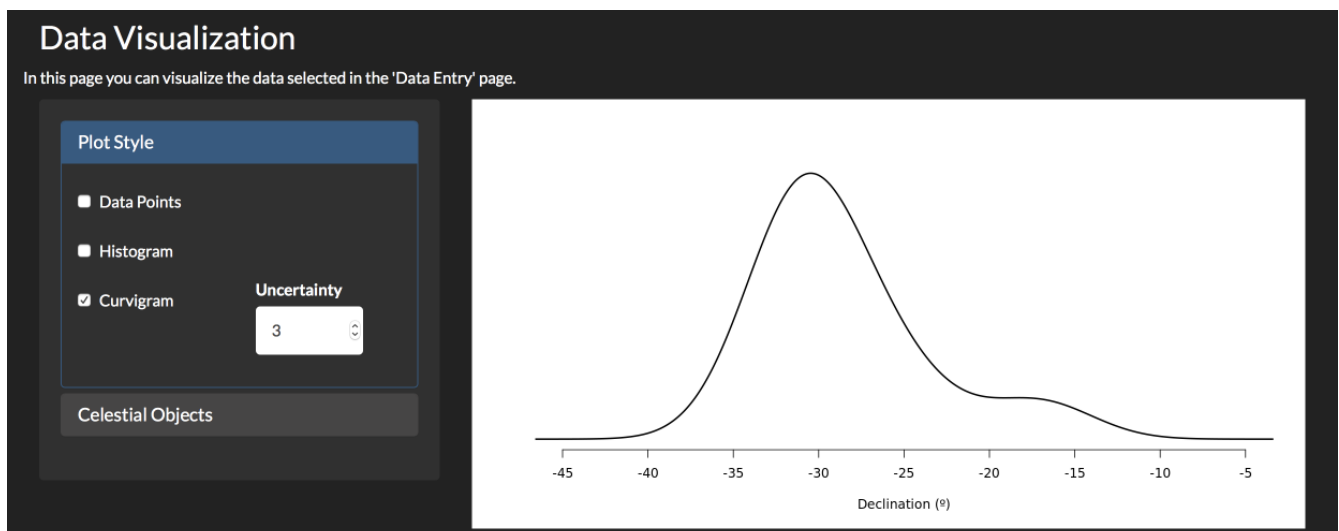
Bin Starts controls where each bar starts

This is what the **Histogram** style looks like

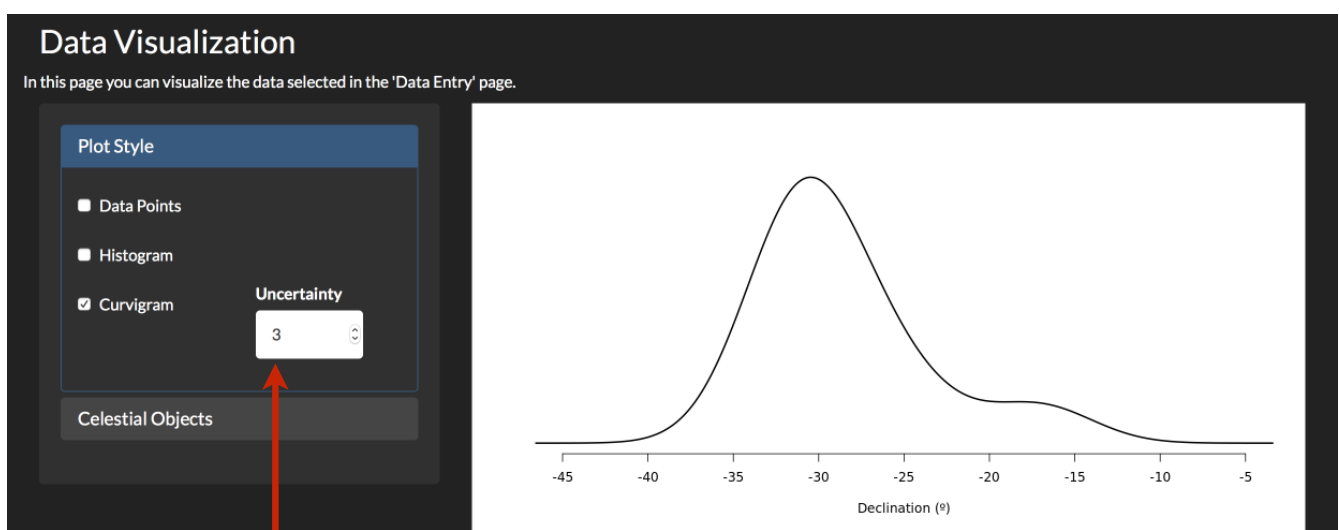


Bin Starts controls where each bar starts

This is what the **Curvigram** style looks like

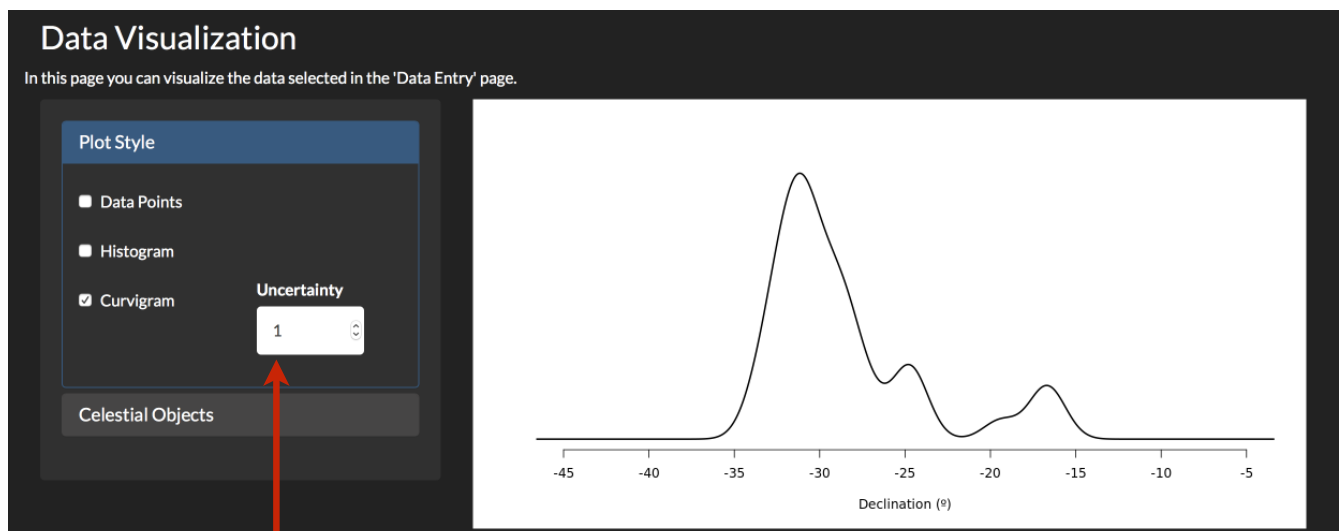


This is what the **Curvigram** style looks like



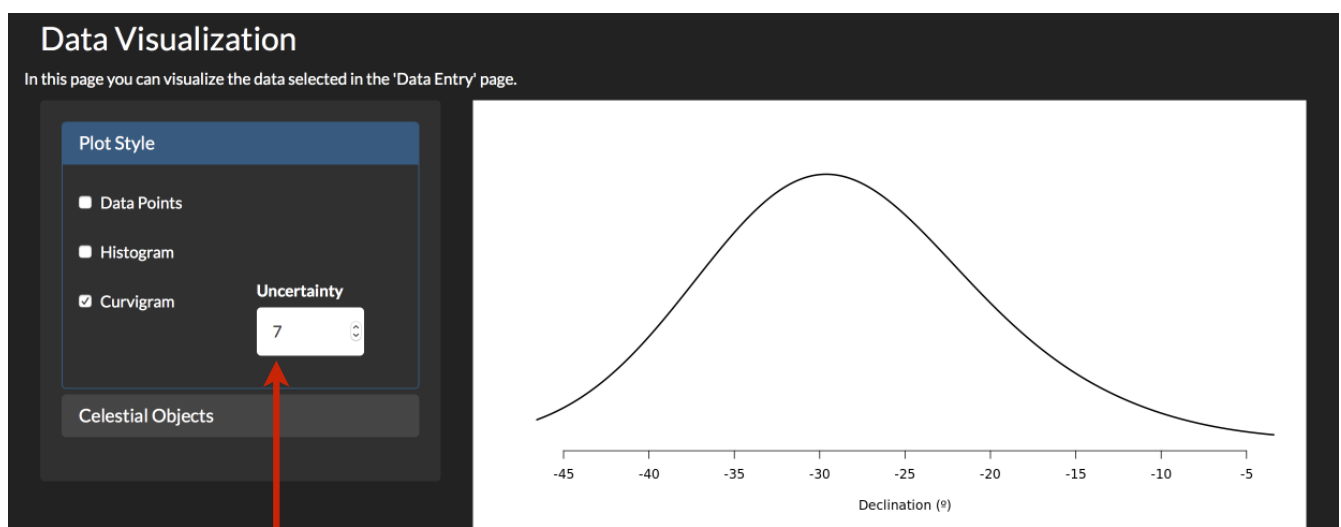
Uncertainty controls the size of the error bar used in the curvigram calculation

This is what the **Curvigram** style looks like



Uncertainty controls the size of the error bar used in the curvigram calculation

This is what the **Curvigram** style looks like



Uncertainty controls the size of the error bar used in the curvigram calculation

You can mix and match them

Data Visualization

In this page you can visualize the data selected in the 'Data Entry' page.

Plot Style

☒ Data Points

Uncertainty

3

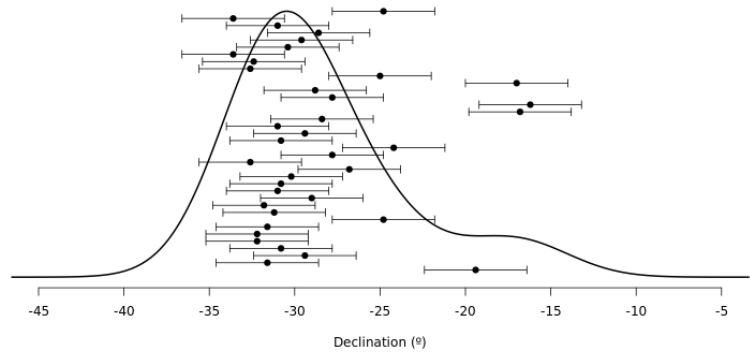
☐ Histogram

☒ Curvigram

Uncertainty

3

Celestial Objects



But what is this for?

The Visualisation module allows for exploratory analysis of (relatively) large dataset, basically, it allows you to more readily identify patterns in orientation across a (relatively) large number of sites

The Visualisation module allows for exploratory analysis of (relatively) large dataset, basically, it allows you to more readily identify patterns in orientation across a (relatively) large number of sites

A peak in a histogram or curvigram represents a declination that is more frequent in your dataset, i.e. more sites will be oriented towards it.

Data Visualization

In this page you can visualize the data selected in the 'Data Entry' page.

Plot Style

☒ Data Points

Uncertainty

3

☐ Histogram

☒ Curvigram

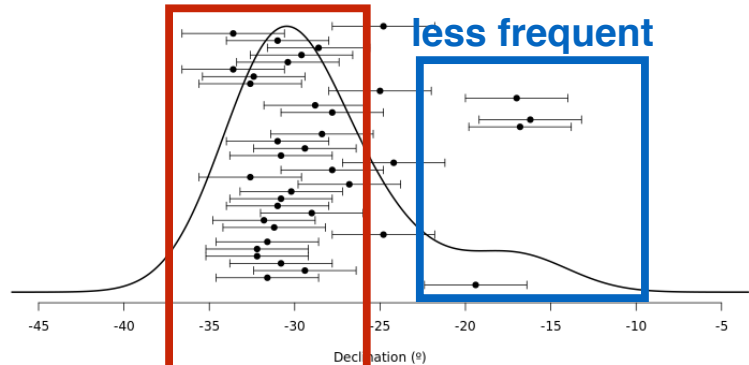
Uncertainty

3

Celestial Objects

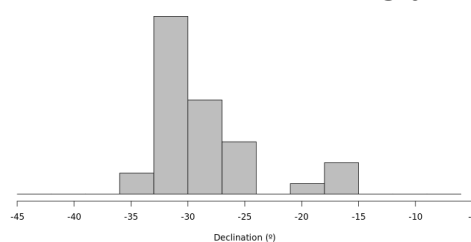
more frequent

less frequent

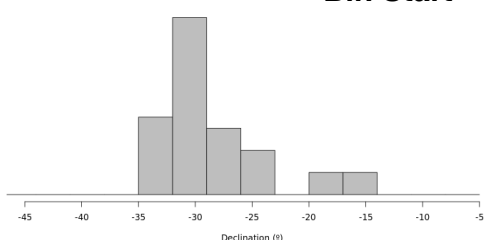


Curvigrams and histograms are common in the literature. I recommend against using the histogram style since arbitrarily changing the Bin Start parameter changes the shape of the histogram considerably.

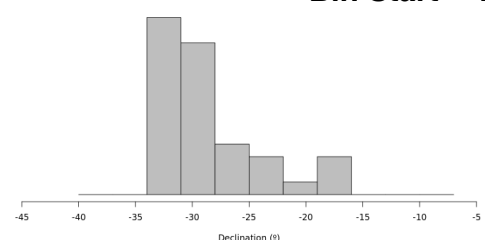
Bin Start = 0



Bin Start = -5

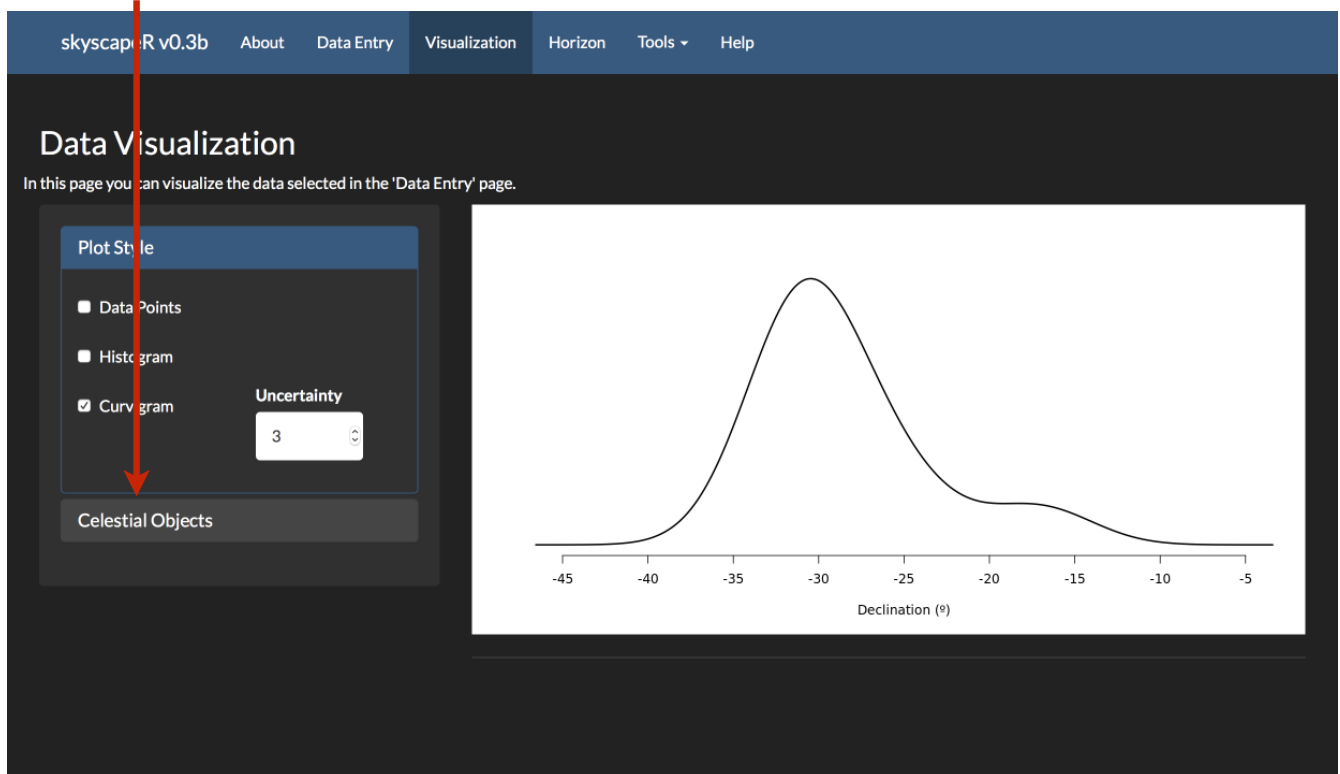


Bin Start = +5



Recommendation for your own work: use the Data points and/or Curvigram styles

To help you check whether any identified patterns might align with celestial objects, use the Celestial Objects collapsible panel



To help you check whether any identified patterns might align with celestial objects, use the Celestial Objects collapsible panel

The screenshot shows the 'Celestial Objects' panel expanded. It includes the following sections:

- Time Period:** 'from' and 'to' dropdown menus, both set to '2000'.
- Sun and Moon:** Radio buttons for 'Solstices', 'Equinox', and 'Lunar Extremes'.
- Stars:** A text input field.
- Custom Dec:** A text input field.

Choose the time period of interest

Leave them equal if interested in single year. Use negative numbers for BCE

To help you check whether any identified patterns might align with celestial objects, use the Celestial Objects collapsible panel

Choose to display solstices, equinox and lunar extremes (standstill) declinations

To help you check whether any identified patterns might align with celestial objects, use the Celestial Objects collapsible panel

Click here and choose from the list or type to search through a list of bright stars (up to magnitude 3)

To help you check whether any identified patterns might align with celestial objects, use the Celestial Objects collapsible panel

Plot Style

Celestial Objects

Time Period:
from 2000 to 2000

Sun and Moon:
☐ Solstices
☐ Equinox
☐ Lunar Extremes

Stars:

Custom Dec:

Type any declination value you wish to display

Coloured lines will appear on your plot so you can look for possible celestial targets

Data Visualization

In this page you can visualize the data selected in the 'Data Entry' page.

Plot Style

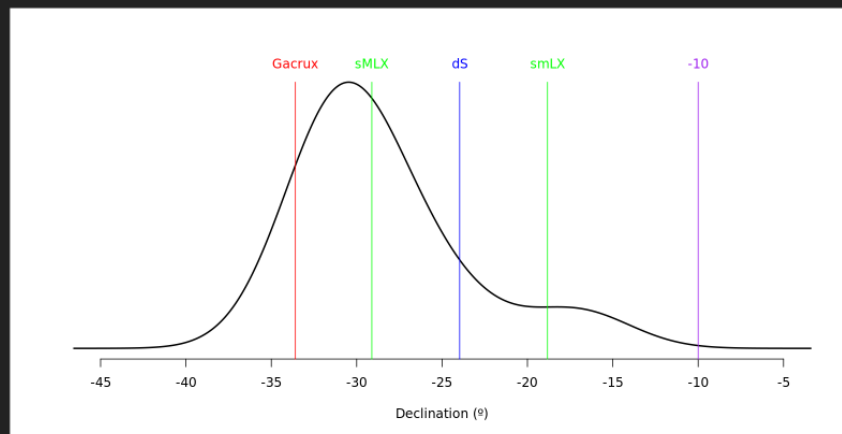
Celestial Objects

Time Period:
from -2500 to -2500

Sun and Moon:
☒ Solstices
☐ Equinox
☒ Lunar Extremes

Stars:

Custom Dec:



If a time period is chosen the lines will get thicker due to movement of the celestial objects

Data Visualization

In this page you can visualize the data selected in the 'Data Entry' page.

Plot Style

Celestial Objects

Time Period:

from

-3500

to

-2500

Sun and Moon:

☒ Solstices

☐ Equinox

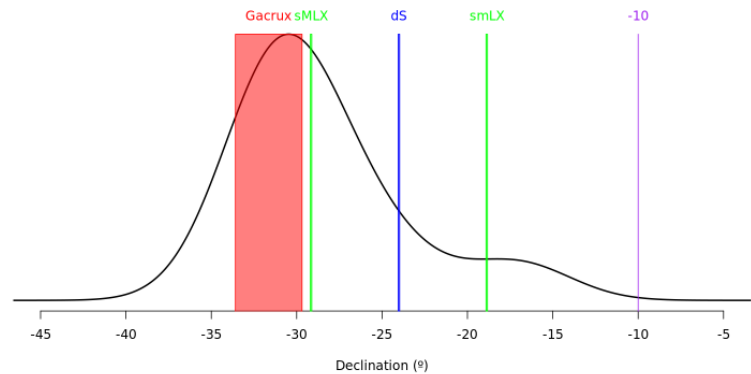
☒ Lunar Extremes

Stars:

Gacrux

Custom Dec:

-10



This concludes the Data Visualisation tutorial. Happy pattern hunting!

Data Visualization

In this page you can visualize the data selected in the 'Data Entry' page.

Plot Style

Celestial Objects

Time Period:

from

-3500

to

-2500

Sun and Moon:

☒ Solstices

☐ Equinox

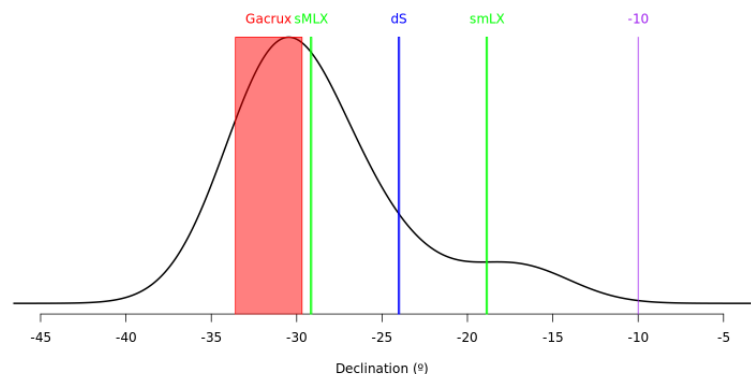
☒ Lunar Extremes

Stars:

Gacrux

Custom Dec:

-10



The Horizon module

[skyscapeR v0.3b](#)
[About](#)
[Data Entry](#)
[Visualization](#)
[Horizon](#)
[Tools ▾](#)
[Help](#)

This is the Horizon page. Not much to look at.

[skyscapeR v0.3b](#)
[About](#)
[Data Entry](#)
[Visualization](#)
[Horizon](#)
[Tools ▾](#)
[Help](#)

Horizon Visualization

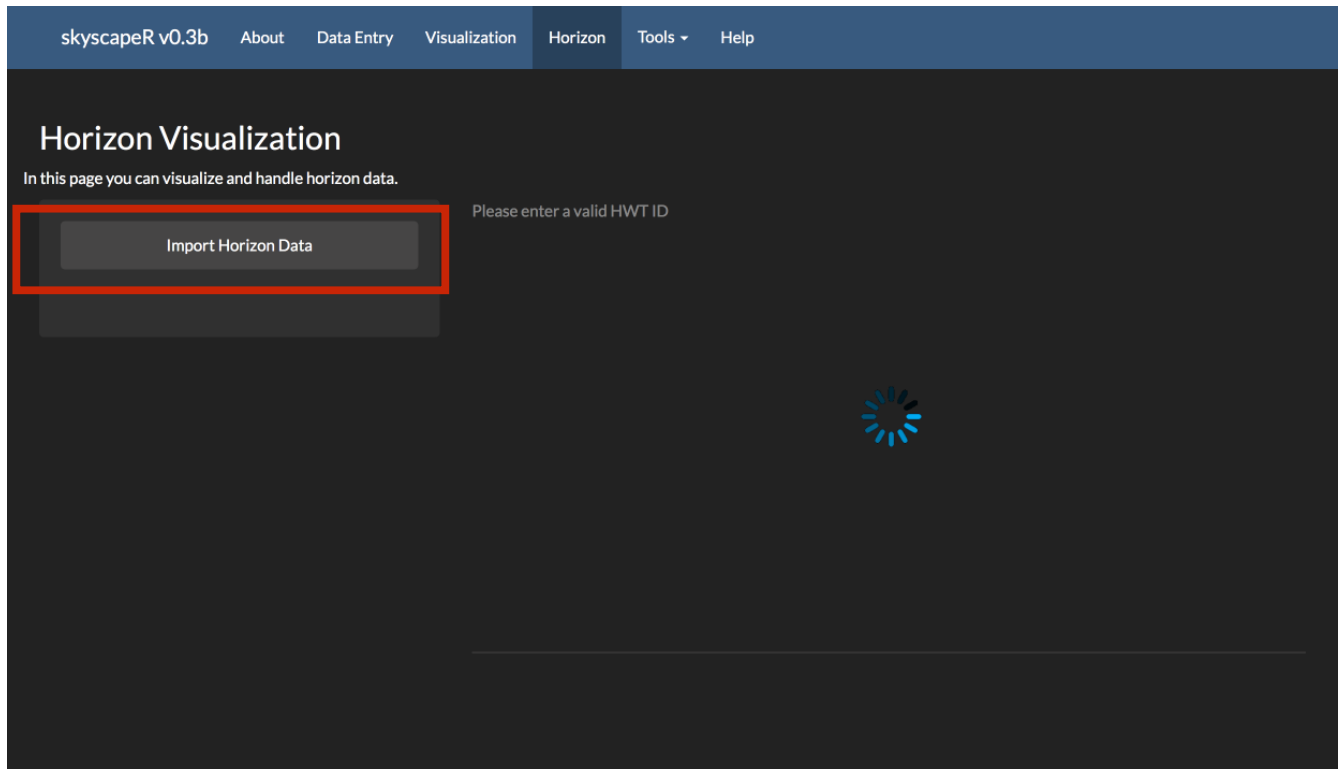
In this page you can visualize and handle horizon data.

Import Horizon Data

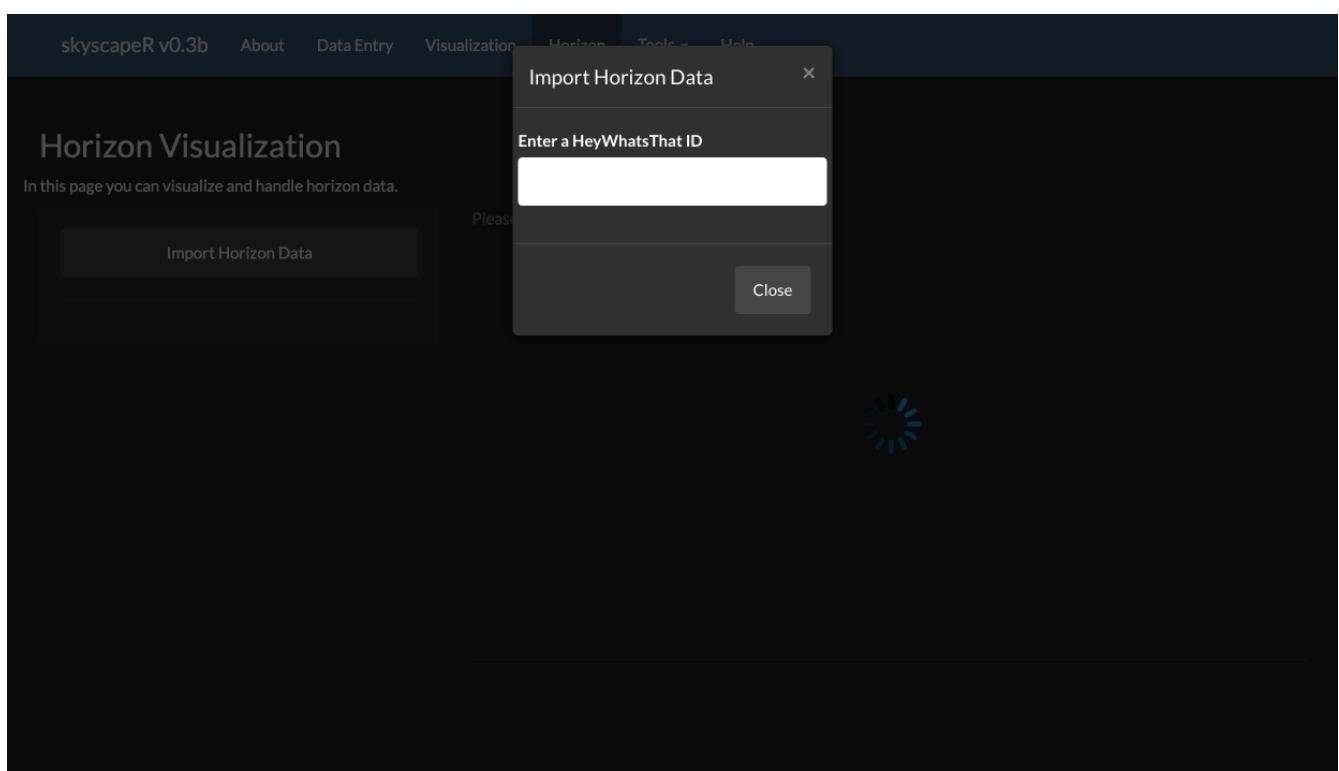
Please enter a valid HWT ID



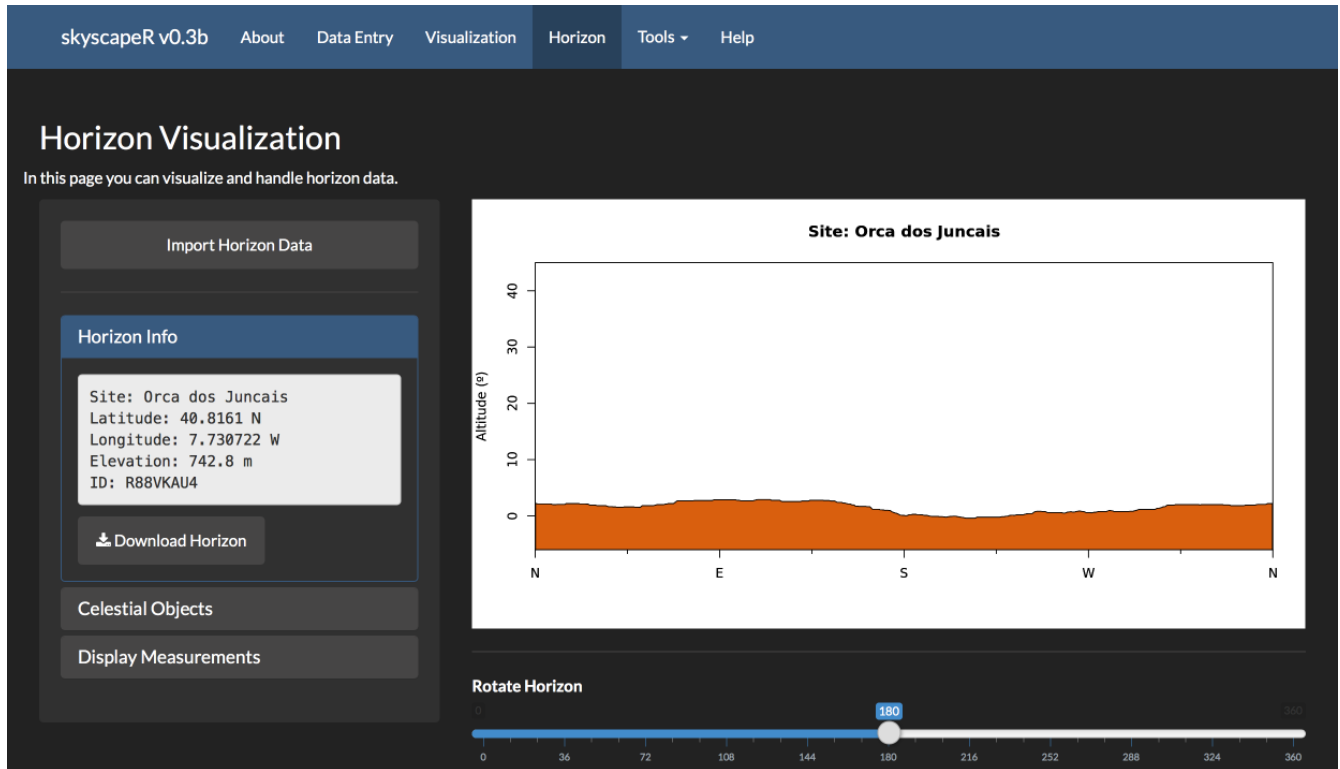
You need to click on Import Horizon Data before the fun begins.



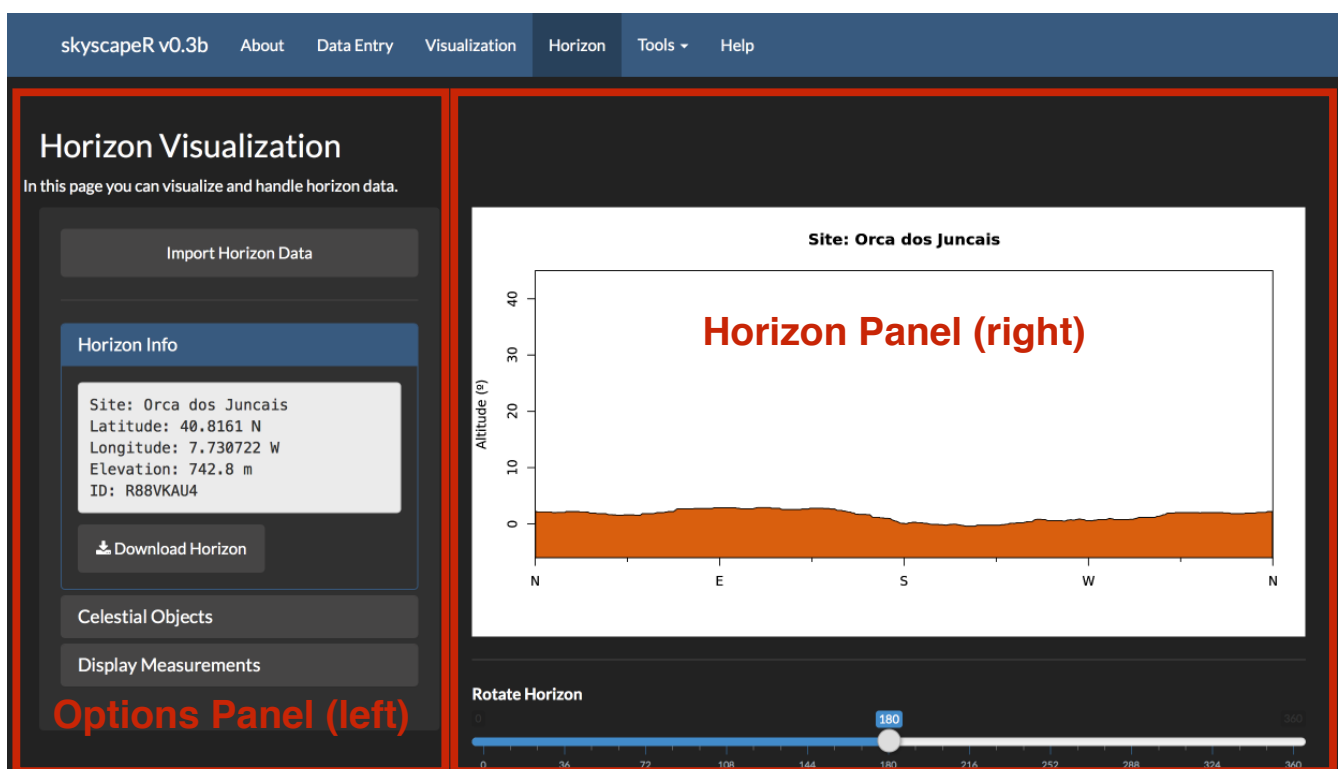
This open a dialog asking for a HeyWhatsThat ID. Type it in and click on Close.



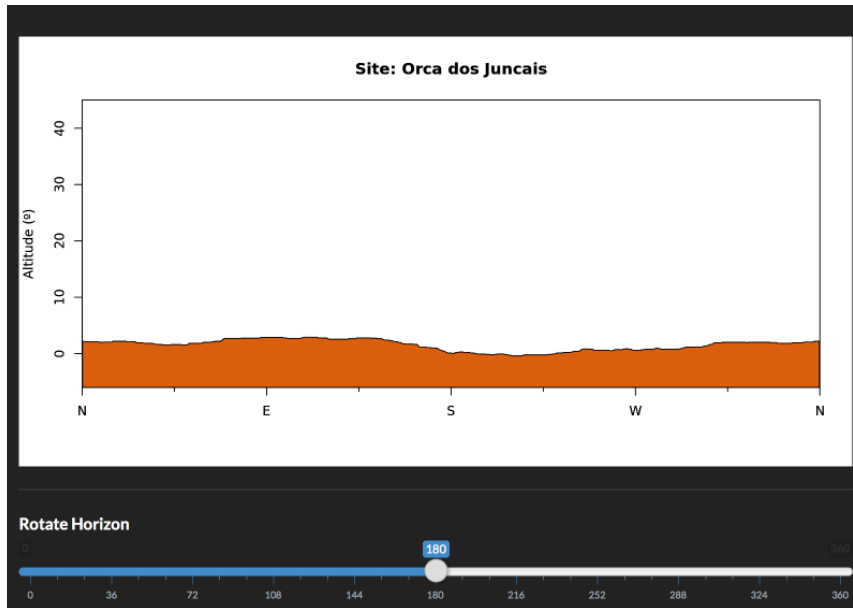
skyscapeR will then download the horizon data from HeyWhatsThat. After a few seconds you should see something like this



skyscapeR will then download the horizon data from HeyWhatsThat. After a few seconds you should see something like this



Let's look at the Horizon panel first



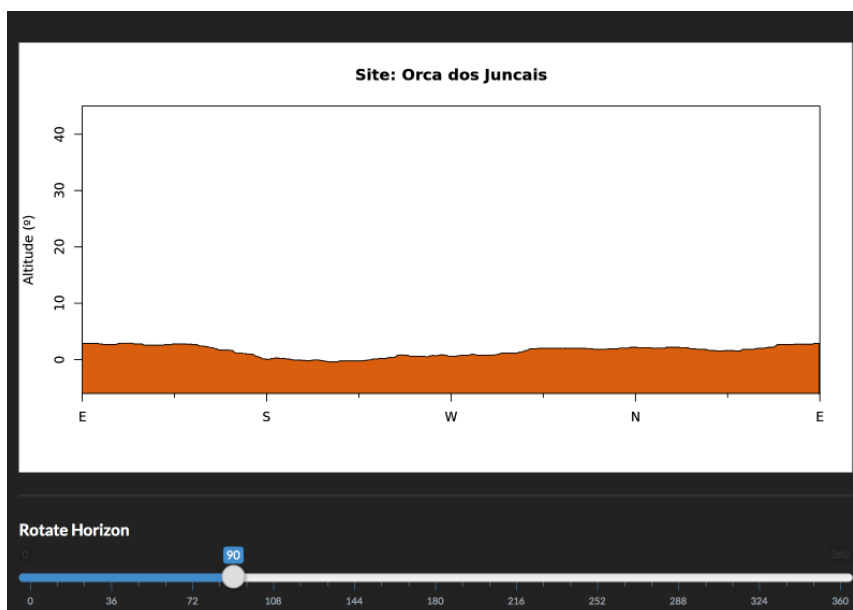
This gives you a view of the horizon at your site, not unlike that of HeyWhatsThat

It uses HeyWhatsThat data

You can see the cardinal points at the bottom, and the altitude on the left

You can also rotate the horizon by using the slider at the very bottom

Let's look at the Horizon panel first



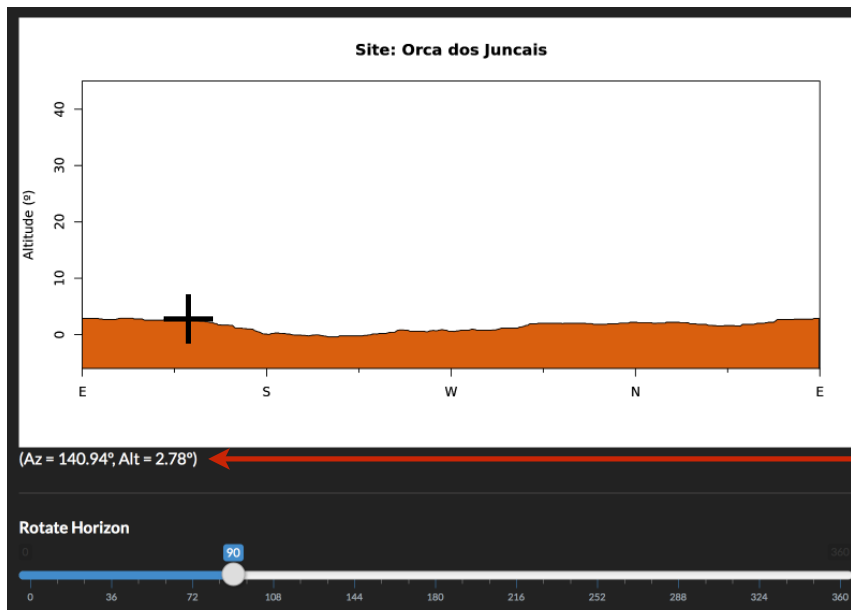
This gives you a view of the horizon at your site, not unlike that of HeyWhatsThat

It uses HeyWhatsThat data

You can see the cardinal points at the bottom, and the altitude on the left

You can also rotate the horizon by using the slider at the very bottom

Let's look at the Horizon panel first



If you click inside the plot the azimuth and altitude of the point you clicked will appear beneath the plot

Now, the Options panel

Import Horizon Data

Horizon Info

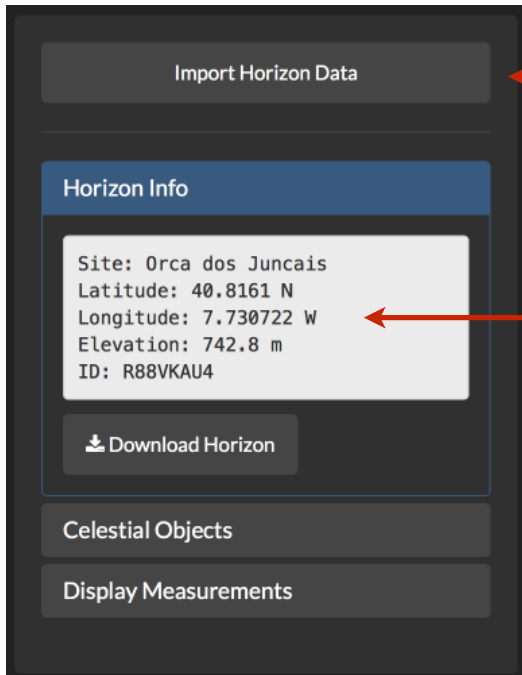
Site: Orca dos Juncais
Latitude: 40.8161 N
Longitude: 7.730722 W
Elevation: 742.8 m
ID: R88VKAU4

Download Horizon

Celestial Objects

Display Measurements

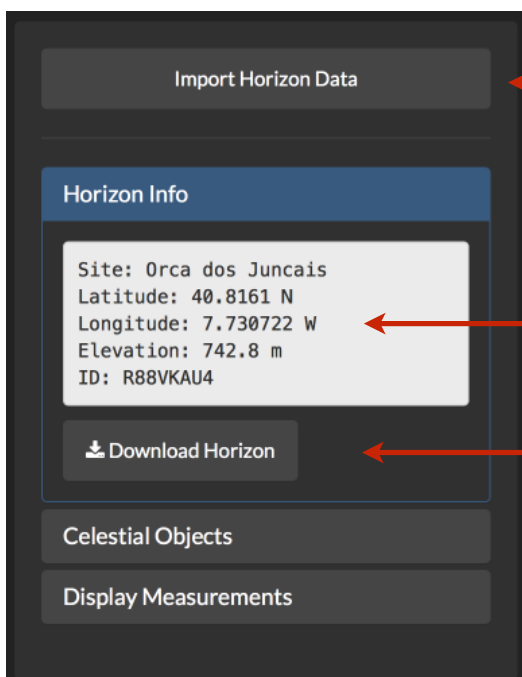
Now, the Options panel



← You can import a different horizon

← This gives you the information from HeyWhatsThat

Now, the Options panel



← You can import a different horizon

← This gives you the information from HeyWhatsThat

← You can download the horizon in a format ready to be imported into Stellarium

Now, the Options panel

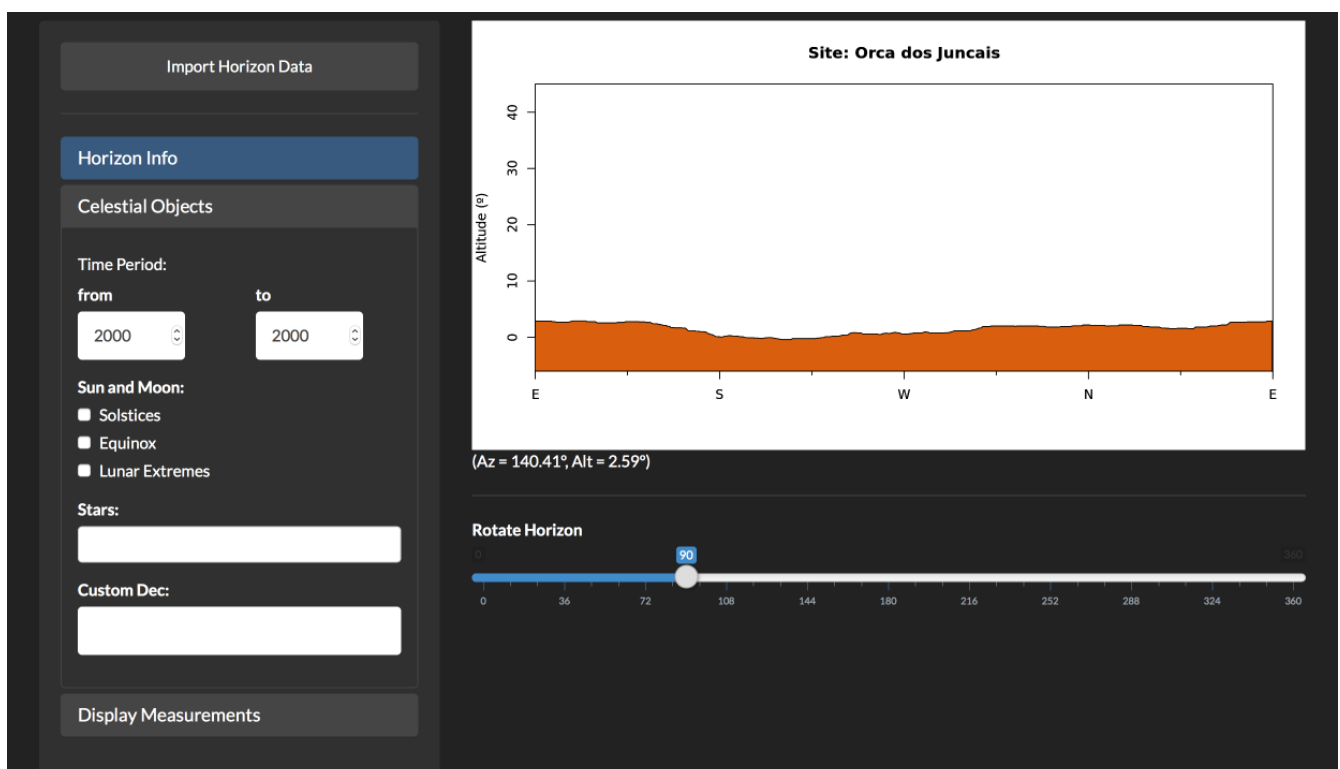
You can import a different horizon

This gives you the information from HeyWhatsThat

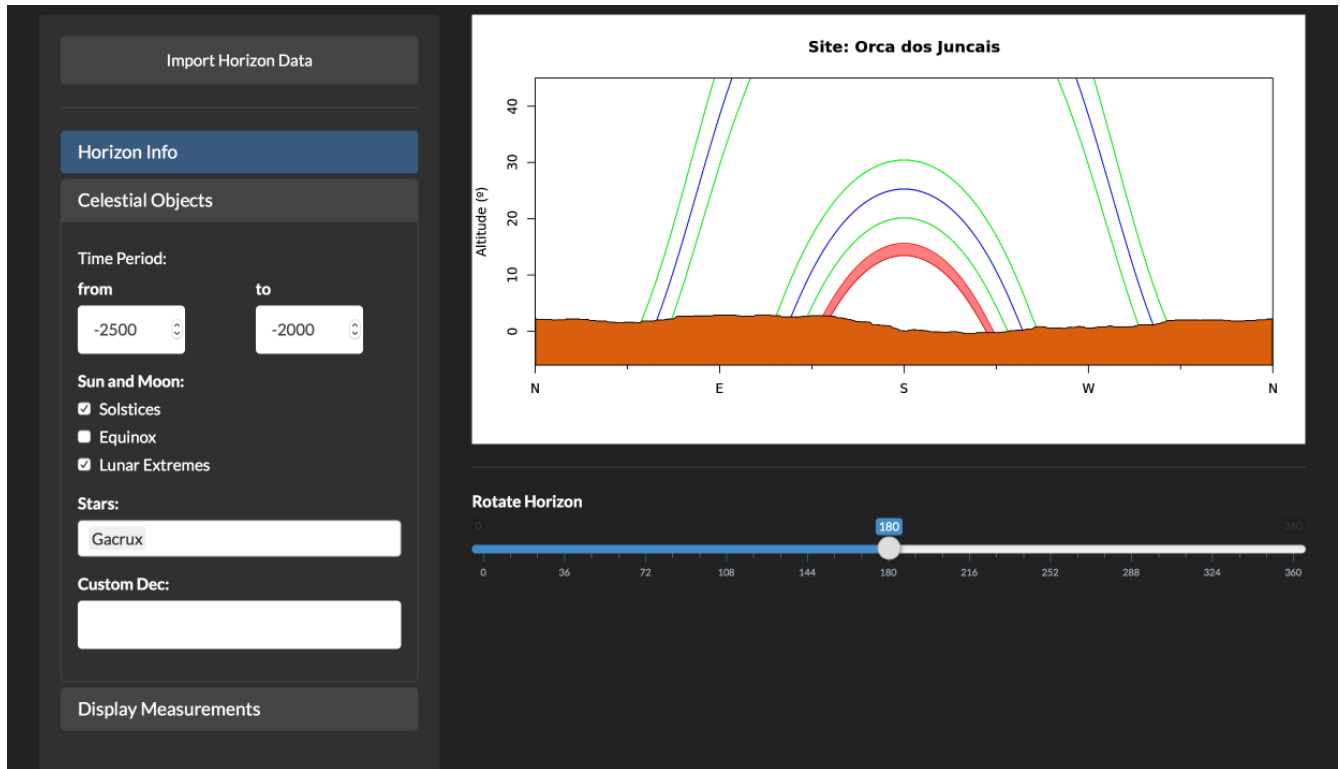
You can download the horizon in a format ready to be imported into Stellarium

This lets you display celestial objects on top of your horizon

You can plot the orbit(s) of celestial objects on your horizon data



You can plot the orbit(s) of celestial objects on your horizon data.
Same colours as in Visualisation module.



Now, the Options panel

The screenshot shows the 'Options panel' of the 'skyscapeR v0.3b' interface. The panel has the following sections and elements:

- Import Horizon Data** (button)
- Horizon Info** (selected tab)
 - Site: Orca dos Juncais
 - Latitude: 40.8161 N
 - Longitude: 7.730722 W
 - Elevation: 742.8 m
 - ID: R88VKAU4
- Download Horizon** (button with download icon)
- Celestial Objects** (tab)
- Display Measurements** (button)

Four red arrows point from text boxes to specific elements in the panel:

- Arrow from 'Import Horizon Data' to the text: 'You can import a different horizon'
- Arrow from 'Longitude: 7.730722 W' to the text: 'This gives you the information from HeyWhatsThat'
- Arrow from 'Download Horizon' to the text: 'You can download the horizon in a format ready to be imported into Stellarium'
- Arrow from 'Celestial Objects' to the text: 'This lets you display celestial objects on top of your horizon'
- Arrow from 'Display Measurements' to the text: 'This lets you display your uploaded data on top of your horizon'

Import Horizon Data

Horizon Info

Celestial Objects

Display Measurements

Choose Measurements:

Uncertainty in Azimuth:

3

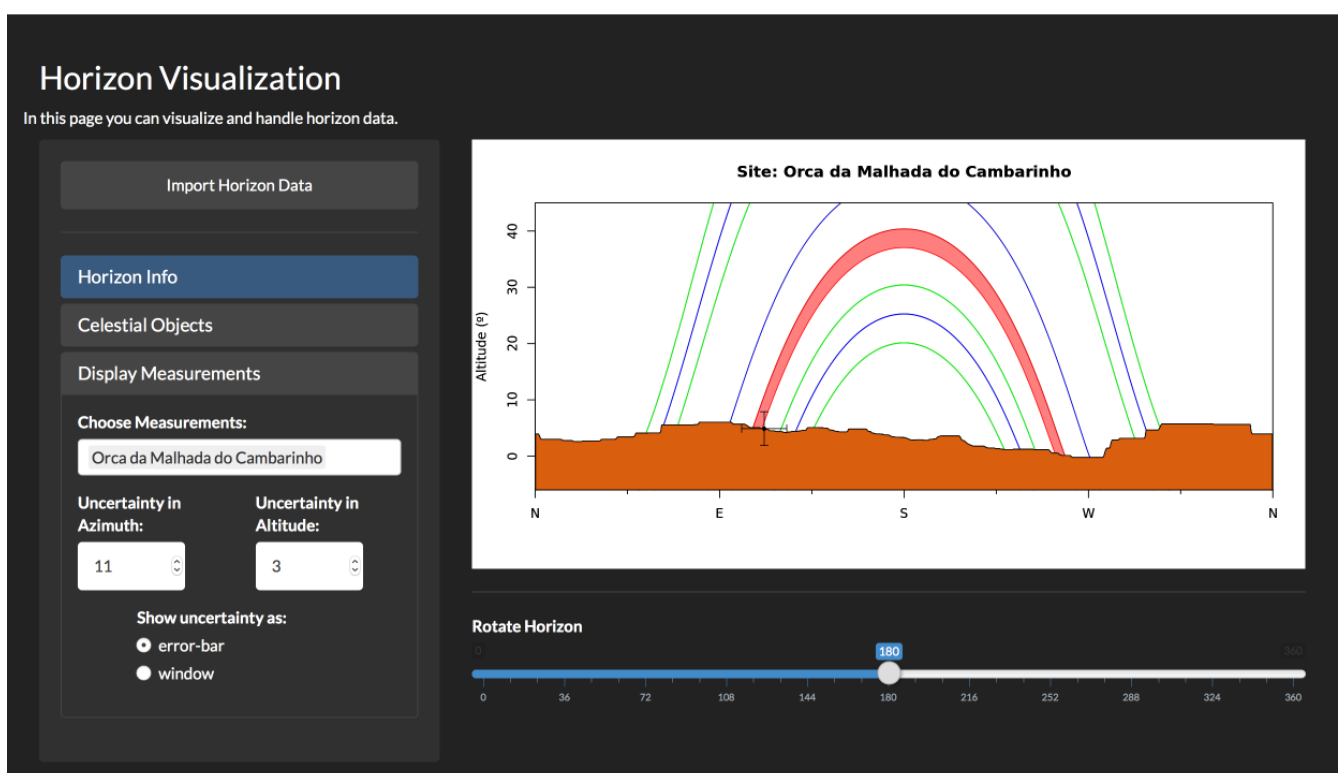
Uncertainty in Altitude:

3

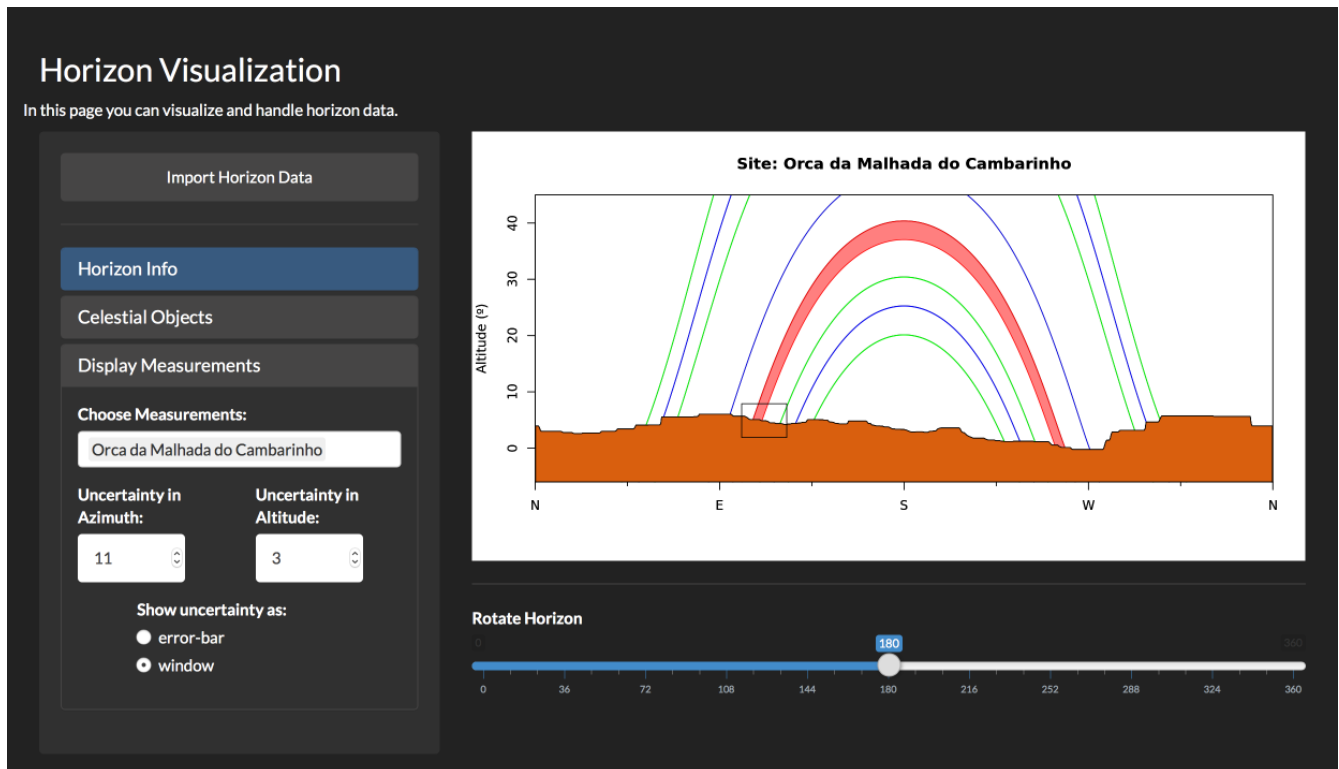
Show uncertainty as:

☒ error-bar
 ☐ window

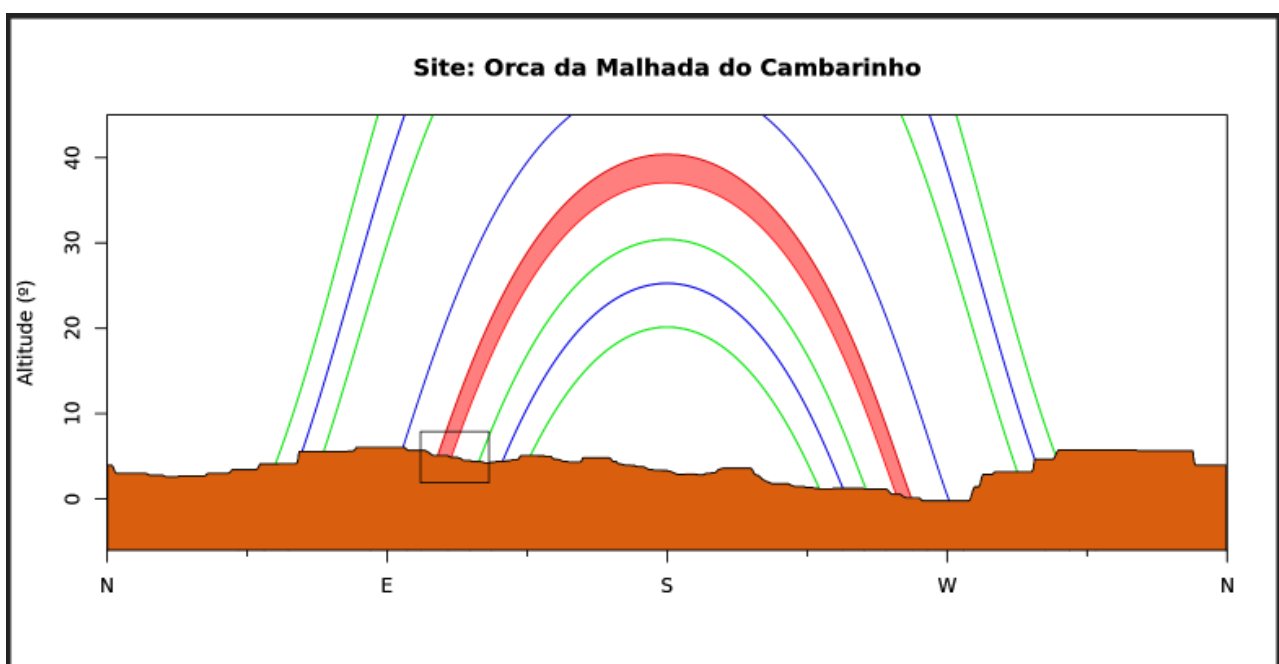
This is what a error-bar representation looks like



This is what a window representation looks like

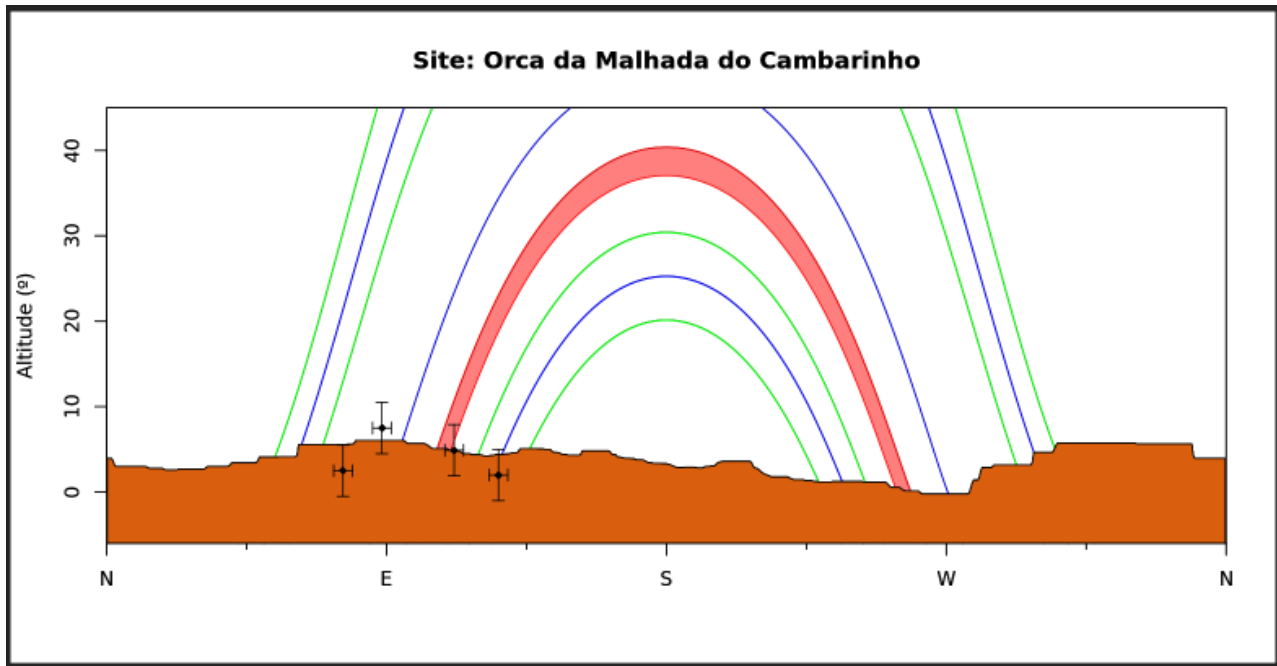


You can use this to identify potential celestial targets:



You can look for what objects rise (or set) within a specific window...

You can use this to identify potential celestial targets:



... or what objects rise (or set) in alignment with multiple stones at one site

This concludes the Horizon tutorial. Happy celestial object hunting!

Horizon Visualization

In this page you can visualize and handle horizon data.

Import Horizon Data

Horizon Info

Celestial Objects

Display Measurements

Choose Measurements:

Orca da Malhada do Cambarinho

Uncertainty in
Azimuth:

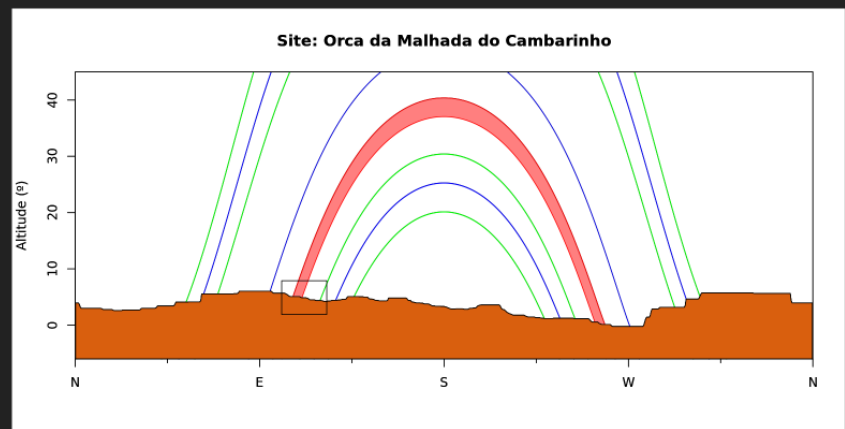
11

Uncertainty in
Altitude:

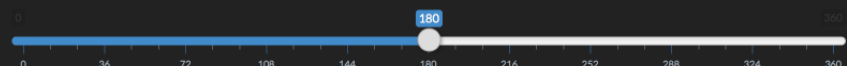
3

Show uncertainty as:

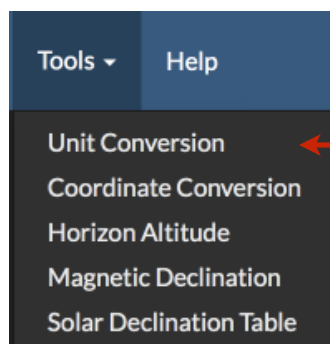
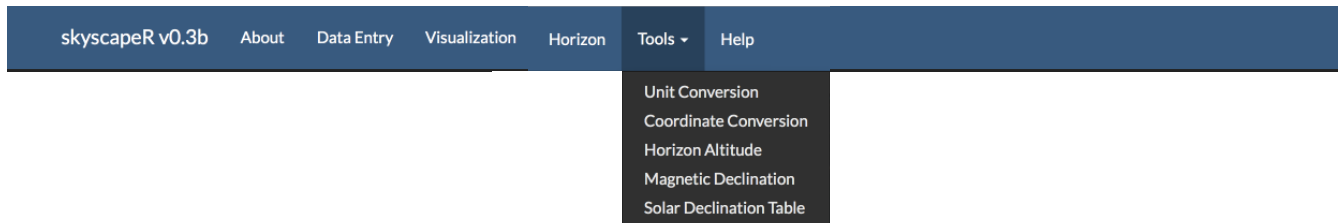
- ☐ error-bar
- ☒ window



Rotate Horizon



The Tools module



Convert between degrees in .° and ° ‘ “ formats

Convert between degrees in $^{\circ}$ and $^{\circ} ' "$ formats

Tools :: Unit Conversion

This tool converts degrees between the xx° yy' zz" form and the decimal-point form (ie xx.xxxx°)

Degree (°)

Arcminute (')

Arcsecond (")

▼

▲

Degree with decimal point(°)

Convert between degrees in $^{\circ}$ and $^{\circ} ' "$ formats

Tools :: Unit Conversion

This tool converts degrees between the xx° yy' zz" form and the decimal-point form (ie xx.xxxx°)

Degree (°)

Arcminute (')

Arcsecond (")

▼

▲

Degree with decimal point(°)

Either...

(1) Type your values here

(2) Click here

(3) Converted value appears here

Convert between degrees in $^{\circ}$ and $^{\circ} \, ' \, ''$ formats

Tools :: Unit Conversion
This tool converts degrees between the xx° yy' zz" form and the decimal-point form (ie xx°)

Degree (°)	Arcminute (')	Arcsecond (")
0	0	0
v ^		
Degree with decimal point(°) 0		

...Or

(3) Converted values appears here

(2) Click here

(1) Type your value here

Tools ▾ Help

- Unit Conversion
- Coordinate Conversion
- Horizon Altitude
- Magnetic Declination
- Solar Declination Table

Convert between horizontal and equatorial coordinates

i.e. convert between az/alt and ra/dec

Convert between horizontal and equatorial coordinates

Tools :: Coordinate Conversion

This tool converts between horizontal (azimuth, altitude) and equatorial (declination, right ascension) coordinates.

Parameters

- ☒ Nutation correction
- ☒ Refraction correction
- ☒ Aberration correction

Latitude (°)

Longitude (°)

Elevation (m)

Azimuth (°)

Altitude (°)

V **^**

Declination (°)

Right Ascension (°)

Convert between horizontal and equatorial coordinates

Latitude (°)

Longitude (°)

Elevation (m)

Insert location values here
longitude and elevation are necessary only for refraction correction

Azimuth (°)

Altitude (°)

Horizontal values here

V **^**

Use this button as in other Tools

Declination (°)

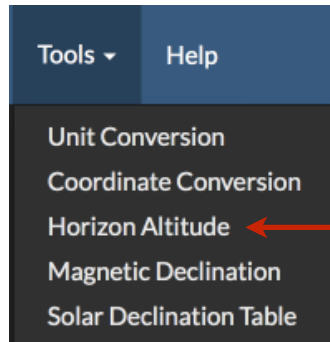
Right Ascension (°)

Equatorial values here

Parameters

- ☒ Nutation correction
- ☒ Refraction correction
- ☒ Aberration correction

These checkboxes control whether to apply these corrections or not. By default, they are all applied and this is the recommended setting.



Calculate horizon altitude from two elevation measurements

Calculate horizon altitude from two elevation measurements

Tools :: Horizon Altitude

This tool calculates horizon altitudes from two elevation measurements (site and horizon point).

Site Elevation (m)	Horizon Elevation (m)	Horizon Distance (m)
0	0	0

Horizon Altitude (°)

Click here for more information

Calculate horizon altitude from two elevation measurements

Tools :: Horizon Altitude

This tool calculates horizon altitudes from two elevation measurements (site and horizon point).

Site Elevation (m)	Horizon Elevation (m)	Horizon Distance (m)
0	0	0

Calculate ?

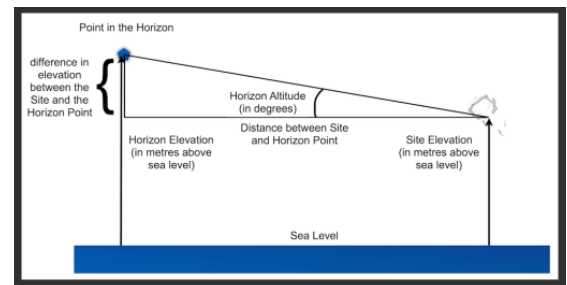
Horizon Altitude (°)

Elevation of your site

Elevation of horizon point

Distance between
horizon point and site

Click here for more information



Tools ▾ Help

- Unit Conversion
- Coordinate Conversion
- Horizon Altitude
- Magnetic Declination
- Solar Declination Table

Estimate the magnetic declination
at a site using the radial technique

Estimate the magnetic declination at a site using the radial technique

Tools :: Magnetic Declination

This tool estimates the magnetic declination (difference between magnetic and true north) using the radial GPS technique (Silva 2010).

1) Insert the geo-coordinates of your site

Latitude Longitude

2) Insert the geo-coordinates of your reference points, as well as their azimuth (as measured from the site)

Latitude Longitude Azimuth

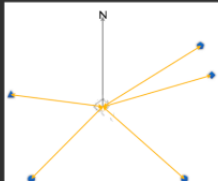
Note : Compare your result to that of the NOAA model [here](#).

Click here for more information and instructions

Estimate the magnetic declination at a site using the radial technique

Instructions :: Magnetic Declination Tool

This tool estimates the magnetic declination (difference between magnetic and true north) using the radial GPS technique of Silva (2010).



In the field:

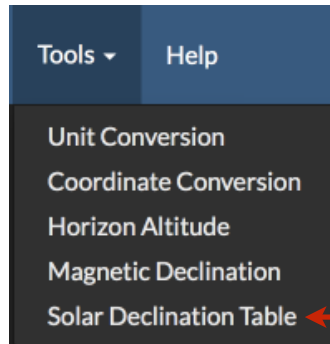
- (1) With the site of interest at the centre choose four or more markers in the local landscape (the blue shapes in the figure above). The more you choose the better, but four to six seems to give good results. Still at your site, measure their azimuths with your compass;
- (2) Move to each of the markers you've chosen and take their GPS coordinates. (Remember to measure the azimuth from each of these markers to your site as well to check, and correct for, local anomalies);

On skyscapeR:

- (3) Insert the GPS coordinates of your site in section (1) of the skyscapeR tool;
- (4) Insert the GPS coordinates and azimuth to your first markers in section (2);
- (5) Click on the + button to add another marker;
- (6) Repeat steps (4) and (5) until all of your marker data has been input;
- (7) Press the Calculate button.

Reference:

Silva, Fabio (2010). A New Survey of Neolithic Dolmens in Central Portugal. *Journal of Cosmology* 9: 3094-3106. Available online [here](#)



Displays a table of the sun's declination for every day in a typical year

Displays a table of the sun's declination for every day in a typical year. You can download it using the button provided.

Epoch	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2000	1 -23.03	-17.21	-7.74	4.38	14.95	22	23.13	18.12	8.43	-3.03	-14.29	-21.74
	2 -22.95	-16.93	-7.36	4.77	15.25	22.13	23.07	17.87	8.07	-3.41	-14.61	-21.89
	3 -22.86	-16.64	-6.98	5.15	15.55	22.26	22.99	17.61	7.7	-3.8	-14.93	-22.04
	4 -22.76	-16.34	-6.6	5.53	15.85	22.38	22.91	17.35	7.33	-4.19	-15.24	-22.18
	5 -22.65	-16.04	-6.21	5.92	16.13	22.5	22.82	17.08	6.96	-4.57	-15.55	-22.31
	6 -22.54	-15.74	-5.82	6.3	16.42	22.61	22.73	16.81	6.59	-4.96	-15.85	-22.44
	7 -22.42	-15.43	-5.44	6.67	16.7	22.71	22.63	16.53	6.22	-5.34	-16.15	-22.56
	8 -22.29	-15.12	-5.05	7.05	16.98	22.81	22.52	16.25	5.85	-5.72	-16.45	-22.67
	9 -22.16	-14.8	-4.66	7.42	17.25	22.9	22.4	15.97	5.47	-6.1	-16.74	-22.77
	10 -22.01	-14.48	-4.27	7.8	17.51	22.98	22.28	15.68	5.09	-6.48	-17.02	-22.87
	11 -21.86	-14.15	-3.87	8.17	17.77	23.05	22.16	15.39	4.71	-6.86	-17.3	-22.96
	12 -21.71	-13.83	-3.48	8.53	18.03	23.12	22.02	15.09	4.33	-7.24	-17.58	-23.04
	13 -21.54	-13.49	-3.09	8.9	18.28	23.19	21.88	14.79	3.95	-7.62	-17.85	-23.12
	14 -21.37	-13.16	-2.69	9.26	18.53	23.24	21.74	14.49	3.57	-7.99	-18.11	-23.18
	15 -21.19	-12.82	-2.3	9.62	18.77	23.29	21.59	14.18	3.19	-8.36	-18.37	-23.24
	16 -21.01	-12.47	-1.9	9.98	19	23.33	21.43	13.87	2.8	-8.73	-18.63	-23.29
	17 -20.82	-12.12	-1.51	10.33	19.23	23.37	21.26	13.55	2.42	-9.1	-18.88	-23.34
	18 -20.62	-11.77	-1.11	10.68	19.46	23.39	21.09	13.23	2.03	-9.46	-19.12	-23.37
	19 -20.42	-11.42	-0.72	11.03	19.68	23.42	20.92	12.91	1.64	-9.83	-19.36	-23.4
	20 -20.21	-11.06	-0.32	11.38	19.88	23.43	20.74	12.58	1.26	-10.18	-19.58	-23.42

At the moment the app doesn't allow users to save their data or settings (an implementation of this is in the works, however).

The best way to work with it is to keep the spreadsheet of your data in a folder where you should easily retrieve it in the future and upload if and when necessary. You can use the Tools module to help you build your own spreadsheet, if necessary. Include corresponding HWT IDs in this spreadsheet (for instance in the Notes column). This is good research practice anyway, particularly if you are working with several sites.

You then have all the information you need in the Data Entry page (including the HWT IDs which you can simply copy from there and paste into the Horizon page).

Graphical analyses (e.g. in the Visualisation or Horizon modules) can be saved to your computer by right-clicking on the image and saving it (as you do with any online image).

Have fun playing with the beta version of skyscapeR

If you encounter any bugs, if the website is down, if something is not clear or if you want to suggest some new functionalities... **email me!**

You are helping to develop the app and making it easy to use.

If you use it in your research, you should cite it as software (not website!). Make sure you include the version number and author. Below is an example in Chicago 16 style:

Silva, Fabio (2017) *skyscapeR* v0.3.7.