FCST24.COM

Also: meteovolo.it, meteovolo.com,parool.ee

USERS MANUAL

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Introduction

Weather simulation:

Weather simulation dataflow for site is like: Satellite data → WRF Global → GFS → WRF Local→ (RASP) → CudaServer.

Satellite data
WRF global 0.12deg
GFS files
WRF local 1km

RASP	Fcst24

Graphical processor
Web server
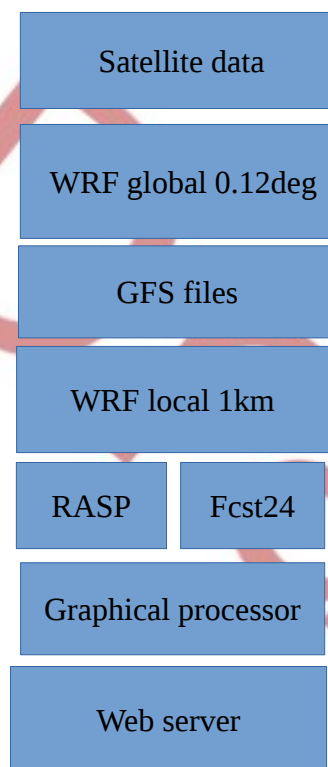
WRF

There are very few weather forecast systems publicly available on internet for operative forecasting. One and mostly only one is the system provided by Weather Research Foundation (WRF), which is United Stated main weather forecast program, used in many continents. It is used by state services everywhere outside Europe. For Europe the system is used by public domain and commercial operators.

GFS

Main public data flow out of WRF Global model is called GFS. It is released once in every 6 hours and describes worldwide weather about 10 days ahead with 3 hour intervals with 0.5 or 0.25 degree precision. GFS does not contain many specific data required for specific uses, so WRF simulation must be run again on finer detail level to get nice data out.

RASP

Rasp is a software by *Dr*. John W. (*Jack*) Glendening containing many implementation of air sports weather calculuses that are somewhat becoming standard.

CudaServer

CudaServer is developed by Elmer Joandi for fcst24.com. It contains fast graphical interface and 3D algorithms for weather data, allowing quick specific queries to large data.

Fcst24.com

This is the main site which shows most of data. It shows all simulations and all variables.

meteovolo.it meteovolo.com parool.ee

Those sites are showing the same data, but are set up for specific region and/or different operator who may want to change variable names, scales, help text and translations or otherwise suit needs of specific group. Username is email address and it is the same for all sites, also subscription is valid for all sites.

User Interface Elements

Menu

Menu opens from right-bottom corner and contains other UI elements.

Opts dialog

This is main dialog open at computer screen. If using small mobile screen you need to open it from Menu. Here you can log in/out, change language, simulation area, maps of interest, map, times.

Under the "C" button there are webcams from webcams.travel .

If mouse is held over hour indicator, then UTC time of forecast is shows, in case there is question about what timezone the forecast has.

For 3D maps there is also the altitude selector, which currently works with flight levels expressed as : flight levels, feet, meters. Default is flight level in meteres – which is reading of metric altimeter when its pressure altitude is set to standard sea level pressure. There are few 3D variables in "All variables" section which are with different scale which is currently not implemented, so for example soil temperature altitude is quite wrong concept there.

The "+" button hides some UI elements to make more space.

Scale

Scale is main working tool for subscribed users – to select appropriate range of scale for current day. The units are also changeable.

Note that scale minimum and maximum colors have significant meaning- denoting either value or value being off-scale. While value is off-scale, for some maps the color is made invisible, to not to show off-scale values. For some maps there is color and off-scale values are marked with raster – end of scale color expressed as dots.

4x view

It is useful when you need to see combined effect of several variables. 4 windows open and then it is possible to select different variables to each of them. Windows move and change time in synchronous ways. Opts dialog selected variable operates the Path and Point tools and 3D level.

Point tool

It shows value of map in time at the point. After opening it, click on map (inside simulation area) to mark the place. At first click it may take time to get the data, so you need some patience. The time is selected from Opts dialog, period (from 1 to 6 hours) from Points dialog.

For some maps there is an high resolution altitude correction for some data, for example surface temperature or wind. This does not apply to Point and Path tools – which makes the map more detailed and graph averaged to mountain area.

Currently loading of data is not marked by any kind of animation, so execute some care to see that data has been reloaded.

Path tool

Path tool is for route planning.

After opening there needs a path to be drawn. It can be done by clicking on map and then clicking some more or dragging the line middle markers. Other option is select a Glider turnpoint set and glider turnpoints from that set – this way it is possible to draw exact route quickly for competitions. Reset button clears the path.

After drawing the path and getting the graph it needs to be checked that it is to the end of path. There is time period selection – if period of 4 hours is selected, but data is available only to 3 hours for current day, then the path will not be covered in full. To check this, hover the mouse over last data points of graph and then you should see map marker walking over path. Check this goes to end.

There is sampling rate selector where sample rate of 1..50km can be selected, to increase/decrease workload of server.

After graph is received, under "+" there is a statistics panel, where most useful is the average under "Avg". For detour calculation the "pgd" - useful for setting for example 500km distance goal and seeing if any detour increases average over goal distance. Tailwind average and track average heading is also calculated

For some maps there is an high resolution altitude correction for some data, for example surface temperature or wind. This does not apply to Point and Path tools – which makes the map more detailed and graph averaged to mountain area.

Bookmarks

Here you can bookmark some maps and send them to your friends by communication means. Not all parameters will remain the same, currently time and scale may change.

LD

It is possible to enter the raw profile of your glider here by describing three points of polar – minimum speed, maximum LD and maximum speed. Polar is roughly made as square root polynomial between them.

Minimum and maximum altitudes of flight make sense for XC speed calculus, to avoid some conditions that are not flyable for your particular situation.

Potential temperature correction does correct both temperature and moisture at one variable for Cu

optimistic and Cumulus thickness maps. Useful for playing around to see how much cumulus cover may vary for particular day.

Do not forget to change those variables back to standard, as they are saved and used next day.

Kml

This is 3D and 4D maps of wave updraft fields that work for some simulation areas. It takes long time to download them and then Google Earth is required for viewing. Unfortunately it overloads Google Earth with details, so it needs some expert use to switch off part of details, to avoid the program silently dropping the detail.

Login

It is currently possible to register by local password, facebook and google.

In case of facebook and google it is easy to click on knobs below Social Networks option.

For local password you need to Register by providing your email address, click on link sent to you by email and then proceed to log in – which may require some patience at first. There is also password reset option where email is sent to you, to confirm reset.

Subscription

Subscription opens detailed views and features that require high computational loads to server each individual client.

It is possible to pay monthly or yearly by Paypal, by selecting corresponding options from dialog. Also it is possible to get bank details from the same interface and then pay by bank transfer.

Yearly and monthly payments and subscriptions(monthly payments) are usually processed automatically. Non-regular amounts (like for 3 months) and bank transfers require currently human intervention and may be delayed by days. For bank transfers there is also no way to understand who sent the payment, unless you state your email in details.

Note that you need to be logged in with the same name you made the payment at Paypal. As it is possible to log in via google, facebook and password, then quite often happens that people log in with email address of their wife (due to wife being logged into facebook at other browser window) and miss the subscribed services.

Fcst24.com maps

Following descriptions are in English, i.e. when English is selected as language. If other language is selected or no language is selected, descriptions may be inconsistent in great deal.

Gliders

X-Country speed

Cross-country speed for Jantar Std. When subscribed to paid service, you can change your parameters at LD window. It calculates XC speed via

For planning XC flights this map has to be used with Point or Path tool where it calculates the average XC Speed for path. Note that this calculus spreads flight time linear to distance, not according to flight speed, so some sensible correction should be applied in pilots mind. For Path tool it shows the wind effect. So it is possible to look for route legs where XC speed is zero or negative (due to wind speed being greater than XC-Speed).

Use patience with XC-Speed and Path tool when using it first time of the day – sometimes it has to do a lot of calculus before it can show something, so it may take half a minute to complete and in some cases the progress dialog is not popping up.

Here is 158km/h average speed predicted for 3 hours task.
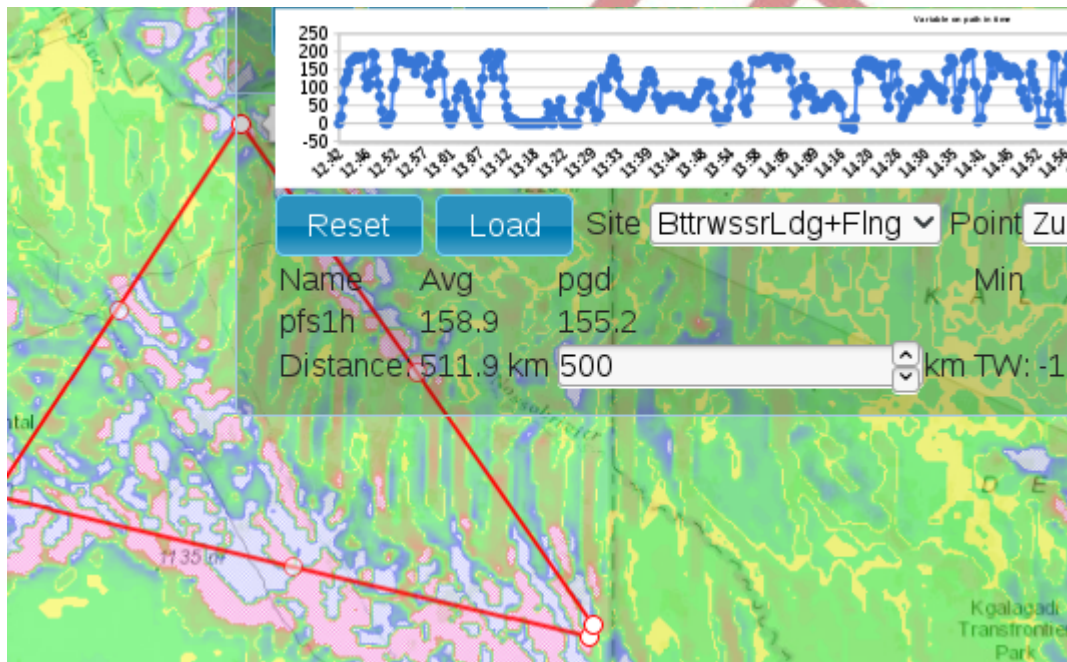
PFD local

Potential flight distance. By default 6 hours from selected time. No geometric analysis - local distance, meaning the distance glider would fly when passing in one location between two strongest thermals.

Subscribed users can change parameters from LD window.

You should increase minimum altitude from LD window, as it is showing marginal lift conditions by default and 300m minimum altitude may be confusing.

The intended use is that user compares this with experience of previous days and then also a bit like artist estimates it himself, taking into account if flying along or across the convergent areas - which is far greater factor to real FD than details of thermal diagram. Algorithm calculates thermal diameters and climb speeds by some science. As there is not much science around for performance factors like wind shear or cloudless thermals, then those formulas are somewhat sucked out of thumb. PFD is not calculating risks, so some risky scenarios like flying low cloud base ridge are equal to high cloud base weaker thermals.

PFD is essentially a 6 hour average of XC speed, so it by nature underestimates as convergent areas move. If there is 3 hours of data available, then PFD also respectively smaller. For paying public it is possible to play around with LD parameters, select flighttime and see the deeper detail or finer scale. The Path tool is there and when to draw a path, then the graph is shown together with tailwind, for XC Speed and PFD. The head/tailwind shows the total speed but does not take into account , it just shows conditions equally spread over distance anyway.

So the PFD for area is a fuzzy factor by its nature. "Correctness" of PFD can be discussed when its calculated knowing the turnpoints. This however requires 3D analysis and maximizing of all possible paths and also calculating risks of different situations and paths. Which is often done better by human eye than computer :) . That is why PFD is and will be rather a rough estimate than "one

size fits all exact solution".

Path and Point tools shows PFD for shorter period if shorter period is selected from tool options. For longer period than 6 hours currently user has to use the tool twice.

Note that calculator for PFD is not taking into account streets and other maximums as compared to XC-Speed. So in following picture for 3 hour flight on 500km track the PFD 300km is predicted, compared to speed 150km/h predicted by XC-Speed, due to maximums being moving around. So use the XC-Speed for Path selection on high-resolution maps.
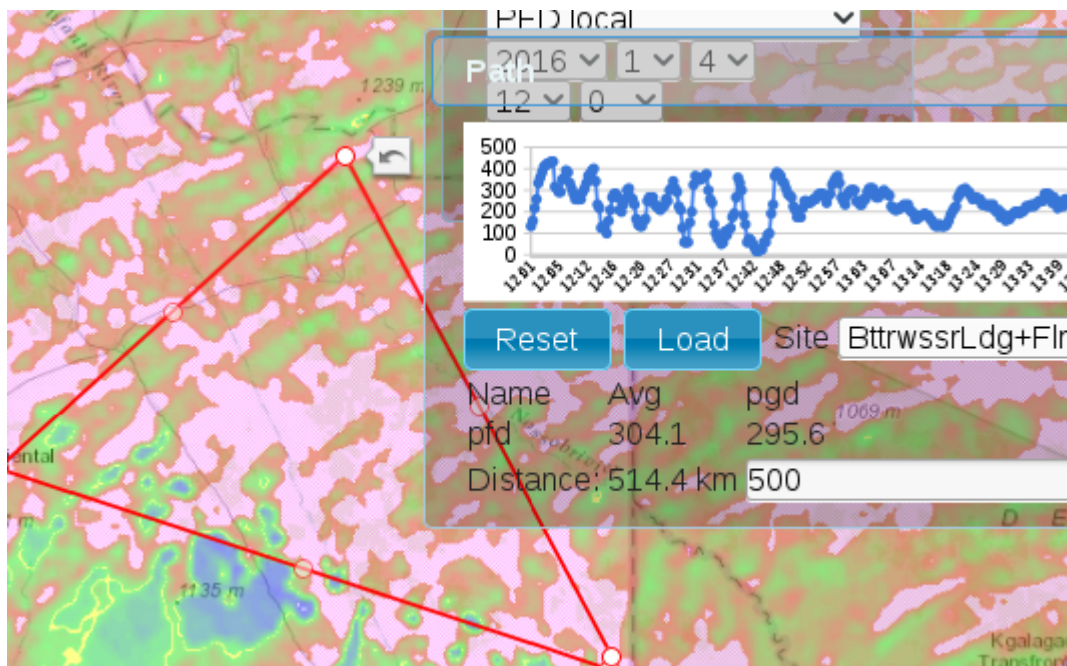
Thermals+

Thermals + Convergence + rain + thunderstorms + thermal height map.
It shows:

- Thermals + Convergence combined lift as color.

- White raster - lift top too close to ground.

- Black raster - rain/thunderstorm or something else unpleasant.

- Scale end color raster - off scale.

- In scale color raster (stripes) - strong ridge(low) lifts

Path or Point tools are not working with Thermals+ map.

Note Thunderstorm rain and thunderstorm convergent wall on following picture, with updrafts scale

2..5m/s
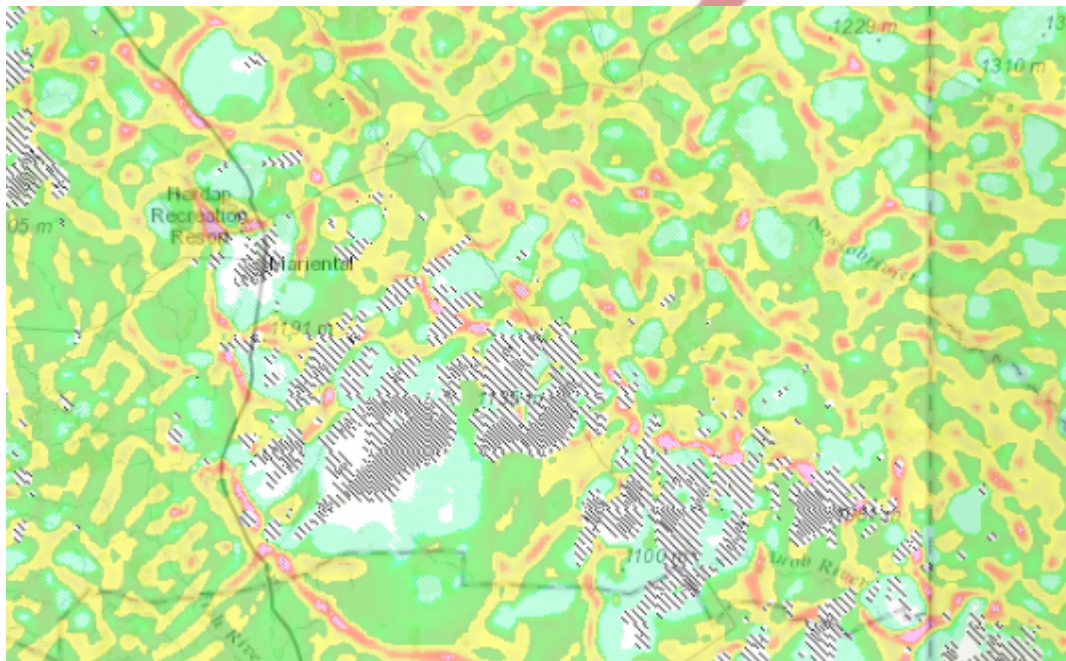
Thermalling height VFR AGL

RASP parameter shows lift top, either constrained by loss of lift or cloud base. This makes it somewhat tricky, as loss of lift means 1m/s lift, while cloud base may have 5m/s lifts.

It currently does not take into accound glider parameters.

Path and Point tools: works, very usable for start and end of day predictions.

Cu optimistic spread MSL

Cumulus cloud base altitude, mostly for mountain areas and other situations like thin Cu where actual Cu may vary with terrain, resulting in Cu at mountain tops with some probability. It was developed for fcst24.com as the RASP Cumulus base calculus was missing details for some scenarios. Essentially it combines RASP Cumulus cloudbase with cloudbase variability.

- Solid color at normal spread,

- thick raster at maximum spread

- stripe raster where no Cu, notes max lift altitude.

- White raster shows Cu touching ground or just being too low.

    In the area between black and white lines Cu is probable - less probable in plains, more probable in mountains.

LD options pane has Potential temperature correction . It greatly affects the picture. Use in morning to match the cumulus onset picture or to play around to see the possible effects of probable simulation error.

Path and Point tools: does not work, use Cu base MSL pessimistic.

Note areas without Cu and areas with less probable Cu in following picture:
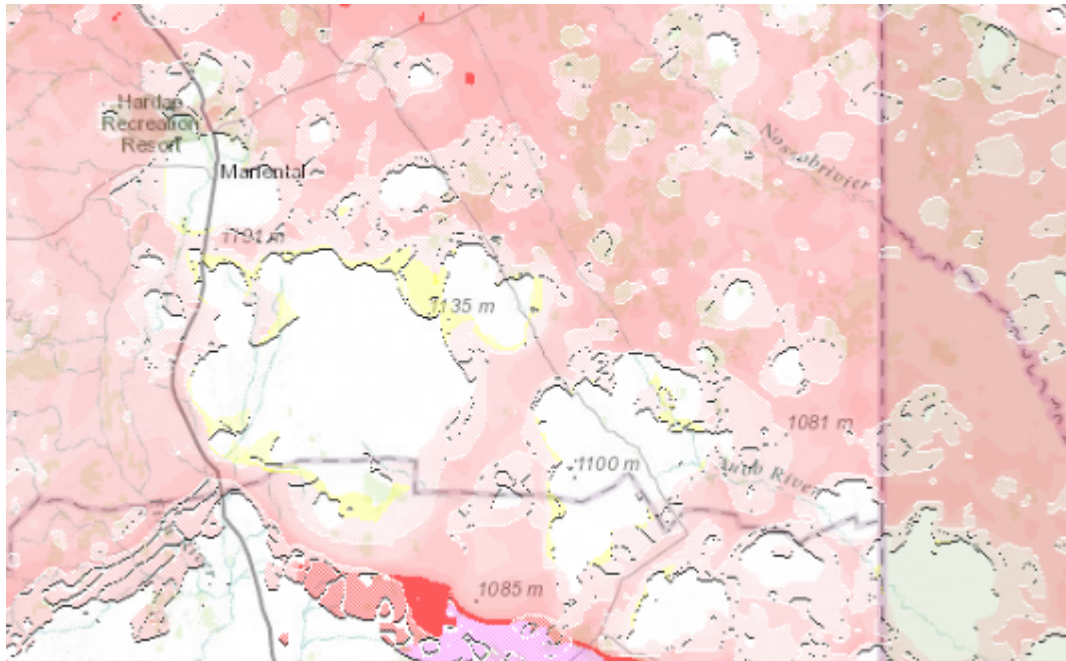
Cu base MSL pessimistic

Cumulus cloud base altitude from RASP. There is Cu base optimistic map that uses slightly different, probability model to show that – usable for thin Cu cases.

LD pane: not affected

Path and Point tools: works. Note that dots on graph mark places where Cu is found, while Cu-less places may sometimes be at the mercy of Google software marked by voids or straight lines.

Cu thickness

This is map showing combining RASP cloudbase and cloudbase variability to show height of cumulus (from base to top).

LD options pane has Potential temperature correction . It greatly affects the picture. Use in morning to match the cumulus onset picture or to play around to see the possible effects of probable simulation error.

Path and Point tools: does not work.

Note Cumulus around thunderstorm area, while inside thunderstorm no cumulus.
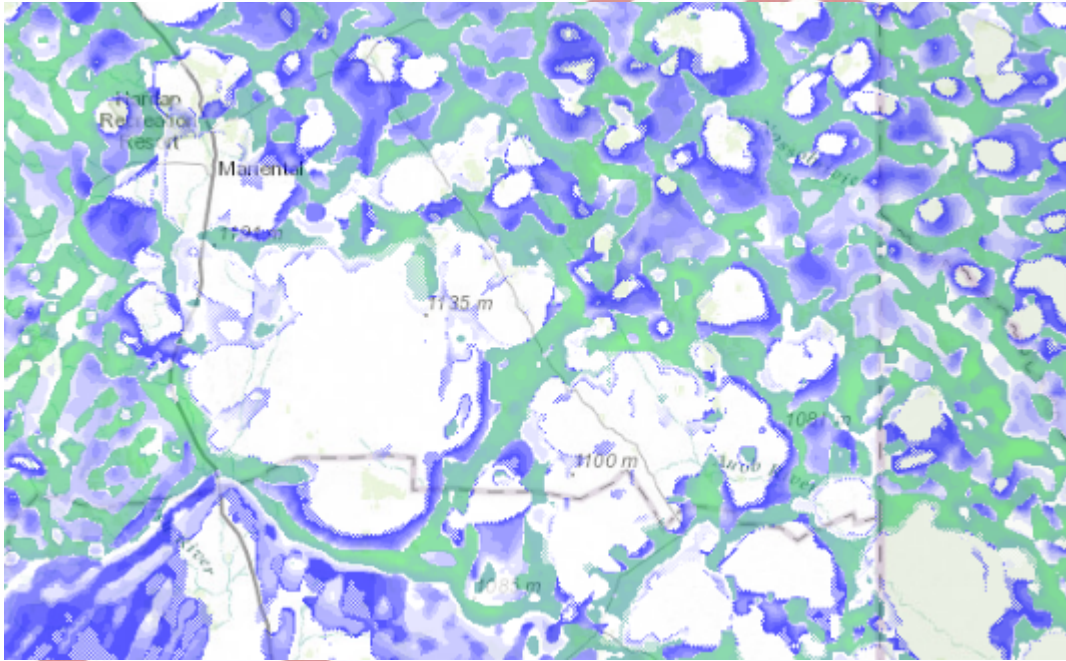
Wave entrance locations

This shows lifts from the altitude marked by vertical slider to a color marked altitude. Note that it works properly with 1-2km resolution domains. 3-5km resolution - it shows real big masterwaves. Black raster means that lift ends in cloud. There are more wave related parameters and detailed instructions at wave soaring section.

Path and Point tools: does not work

Note the big thunderstorm edge convergence being detected as wave lift ending in cloud.
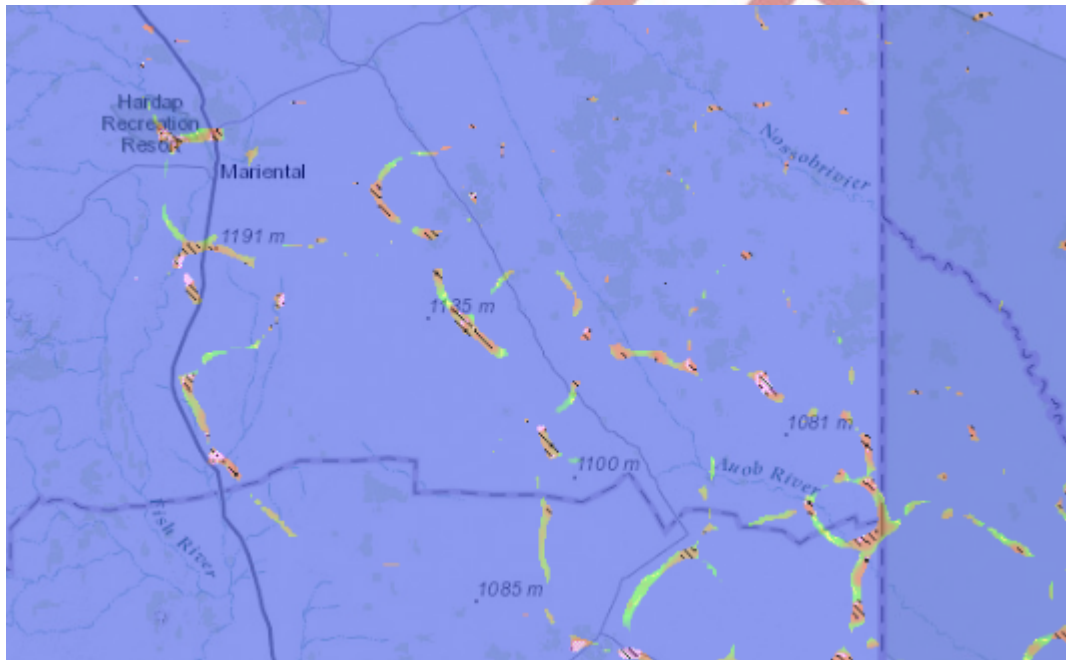
Sun

It is quite misnamed, as it creates an impression of visible sun. But energy flow and perception by human eye are quite different – one is linear and the other is exponential. So the Sun map has to be seen together with SAT IR Comparable.

SAT IR comparable

It tries to be comparable with Satellite Infrared pictures, essentially showing clouds other than boundary layer thermal clouds. As it works on emitted temperature of planet outer surface, then it to some extent needs some scale change for winter/summer.

Overdevelopment cloudbase

 It is a RASP map which shows the "spreading out" altitude of cumulus cloud top in case when something prevents cloud to develop to its normal height. As it is not very exact, then some experience is required to understand the process. You may also want to see other maps (Thermals+) to understand if the overdevelopment process is starting to affect thermal performance in serious manner.

Thermal Updraft Velocity

Plain thermal updraft from RASP – it is here as the Thermals+ map is not working with Point and Path tools. Note also that thermal updraft velocity is quite changing value, so for thermal strength around 2-3 m/s there kick in a lot of other efects, which may result in speeds 4-5m/s and be better described on Thermals+ map. Currently here is quite an "one solution suites all" type of thermal updraft. XC-Speed and PFD calculus use internally much more complex formulas and take glider type and circling radius into account.

This map is useful for determining days start and end on Point and Path tool. For expected thermal strength for normal day it is severely underestimating it, as lots of other phenomena must be taken into account.

Thermalling height VFR MSL

From RASP. The same as thermalling height VFR AGL , just expressed in MSL for mountain people.

Inversion

First inversion layer that is in scale, counting from bottom up. Altitude is MSL. Does not show inversions out of scale, change scale to get them.

Note that for some cases you may want to raise the lower end of scale slightly above zero, as there may be some non-significant inversions near ground.

Tropopause height is also clearly visible, if to change scale to that range.

Point and Path tools are not working with this map.

Convergence (BL)

This is maximum convergent(non-thermal) updraft in boundary layer.

I.e. place where there come together different winds due to ridges, cloudstreets,waves, etc. resulting air slightly moving up. Note that Convergence actually means the situation where two large air masses are bumping into each other, while with high-resolution simulation that map shows lots of other things too.

As it is average for cell, then the value is not representing actual updraft, but rather an average. So the number is quite different for 3km and 1km simulation. For 1km simulation this is quite truthful number, for 3km it should be multiplied by eye a little.

Taken from DrJack RASP blipmaps

Precipitation

Every kind of things that may fall out of sky – rain,snow and other types of fallouts. Note that scale is transparent near zero, as there are sometimes very tiny nominal rain falling.

Relative humidity

3D Relative humidity, useful for to see where the clouds are about to form or places where clouds cut the mountains.

Point and Path tools are not working with this map.

Wind 3D

Wind at selected altitude – where altitude intersects mountains (in simulation) then near ground direction is shown on without color

Point and Path tools are not working with this map.

Wind @ 10m

Wind near ground. Note that it is corrected with high resolution terrain altitude map, so for mountain areas you have to execute some common sense.

Point and Path tools are working but without altitude correction.

BL Average wind speed

From RASP. Average wind speed in boundary layer, useful for determining actual wind effect for normal thermal flight.

Wind BL top

From RASP. Boundary layer top wind – useful for determining if there is significantly stronger wind at boundary layer top. Note that if there is high cumulus, then boundary layer top is way out of reach for normal gliding flight. So it is for cloudless or thin clouds situation to see the effect of staying near cloudbase.

Buoyancy/Shear Ratio

From RASP. Lift to boundary layer wind shear ratio which shows "thermals broken by wind" situations. Note that it is not currently taking into account situation where windshear occurs strongly in narrow altitude range, so you need to check the 3D Wind for that if this is some really competitive situation.

Thunderstorm

CAPE (Convective Available Potential Energy), i.e. Thunderstorm possibility. For every area and season it is slightly different, but the numerical value above 2000 tends to show thunderstorms for normal summer weather. Nicely shows frontal movements that associate with thunderstorms.

Clouds 3D explicit

Useful for looking where exactly the clouds are and where they intersect mountains. Note it (almost) does not show Cumulus clouds unless these are getting really about 7/8 coverage.

Paraglider

X-Country speed

Look for detailed description at Gliders section. Note that LD parameters for this map are fixed to average wing, so if you feel the need to change your wing parameters, you need to use the Gliders section

Potential flight distance 6h

Look for detailed description at Gliders section at PFD Local. Note that LD parameters for this map are fixed to average wing, so if you feel the need to change your wing parameters at LD section, you need to use the Gliders section

Thermal+ridge strength

Look for Thermals+ at Gliders section for documentation

Thermalling height VFR AGL

Look for gliders section.

Note for flying near ground in mountains: High precision ground map is used to get high precision output, but it does not free user from need to execute common sense. Specifically deep valleys may show weak thermal flight altitude being present .

Point and Path tools work without high precision.
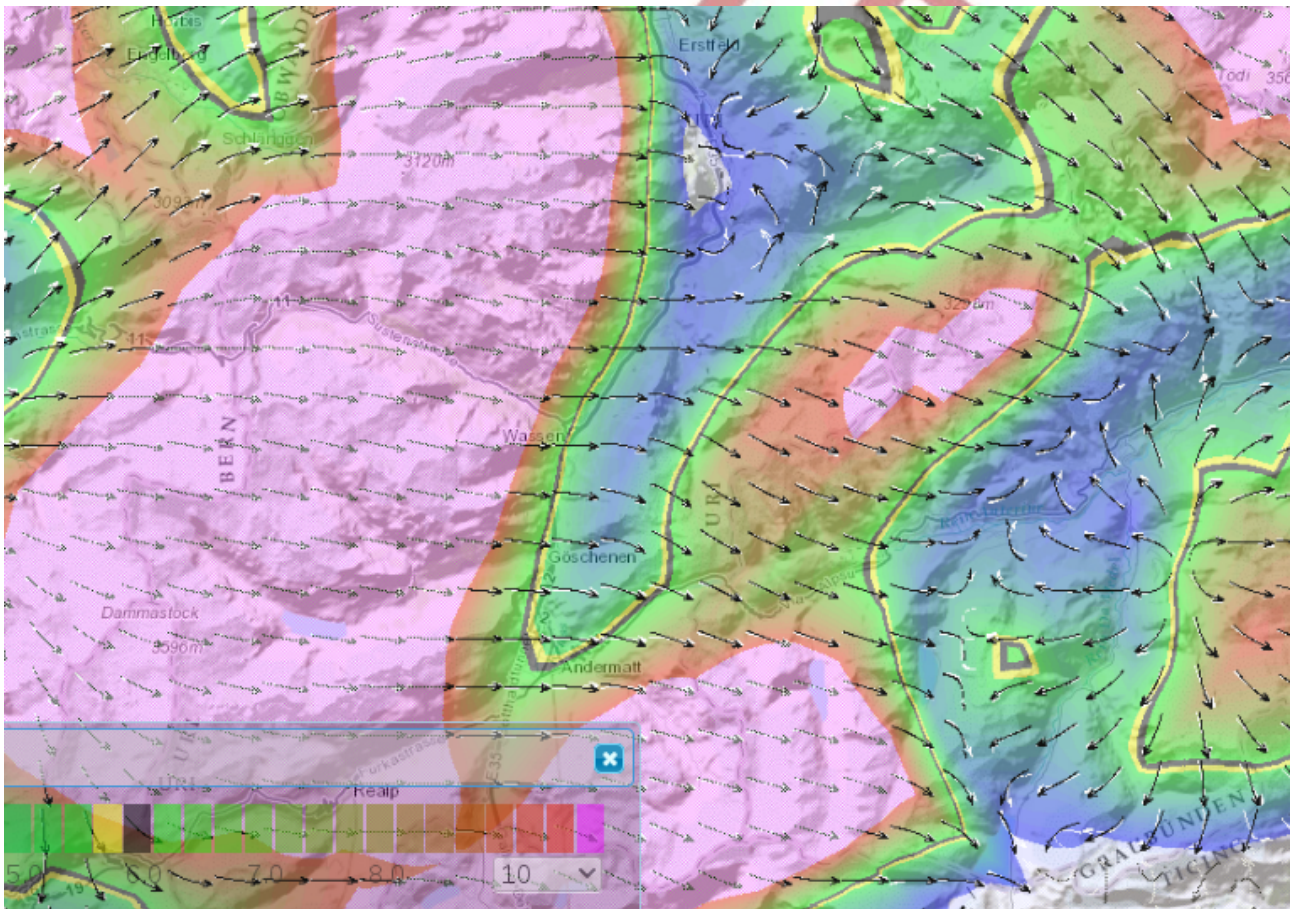
Cu base and thickness

Look for Gliders section for those maps

Wind @ 10m Gust

Shows the places where medium or low winds may give gusts or change direction. White arrow shows the possible direction change where color shows the maximum wind strength in gust.

Thermal layer average wind

Look for BL average wind at Gliders section

Surface solar radiation

Look for Sun in Gliders section

Ridgelift with wind direction

Useful for ridge flying and start places. Adjust the altitude to rough takeoff altitude and see takeoff places with updraft strength and wind direction. Note that it works correctly at 3km or finer (for lower mountains) resolution. So looking it on 5km map is not very fruitful.

Here is Alps 3km :
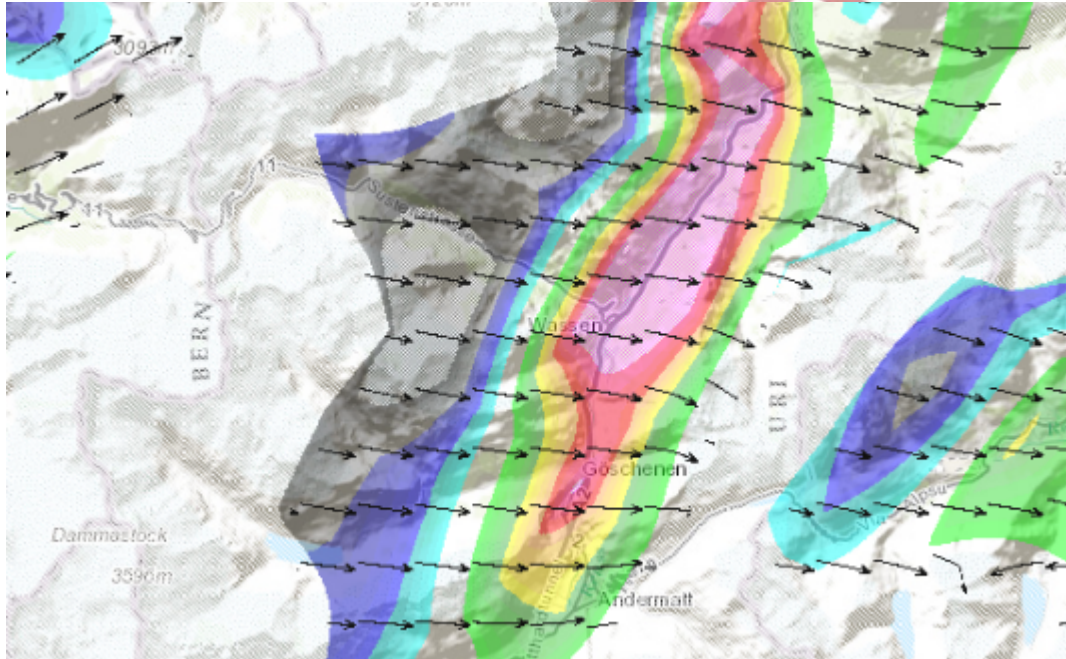
Wavelift spots

Places to get into wave. From Opts pane select the altitude and then color shows the possible max lift altitude. For subscribed users the minimum sink parameter works. Black raster shows the lift ends in clouds. For additional documentation look wave section.

For paraglider, note:

- that it takes into account minimum sink from LD options dialog, so you may want to change that temporarily to 2m/s. Change back so it wont disturb XC-Speed calculus
- It does not take into account situation where wind is higher than gliders minimum sink speed. For that you need to increase the minimum sink yourself

Wave from 3300 to 9000m at Alps 3km map:
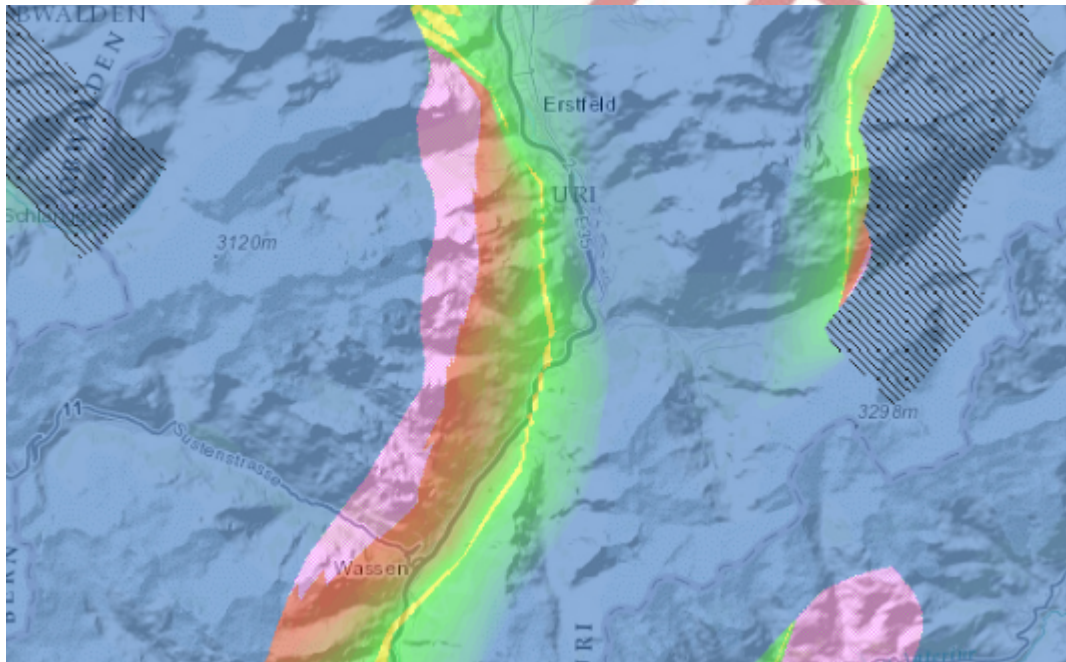
Inversion

Look for Gliders section

Takeoff turbulence

Turbulence (micro and macro) near ground, U*. It would be interesting to hear a feedback about how it works in reality.

Wave soaring

Wind @ 10m

Look for Gliders section

Wind

Look for Gliders section

Climb .. → ..

Wave Entrance maps, set for ranges. Basically it shows that being at altitude noted at Opts dialog altitude selector, you can climb to altitude noted on scale, using glider with minimum sink described at LD dialog.

Notes:

- Change the LD minimum sink back after using it, as it affects other parameters
- It does not take into account situation where wind speed exceeds your wing minimum sink

speed. So for high-wind situations currently it is needed to increase minimum sink even more.

- Black stripe means lift continues in clouds. Note that it is not cloud coverage picture, so you need to take the ¼ view and see the SAT IR comparable or other cloud map specific to your situation in parallel.

- The algorithm is going to almost straight up climb, so for higher climbs you need to study the situation for several altitudes.

- White means altitude is cutting the ground.
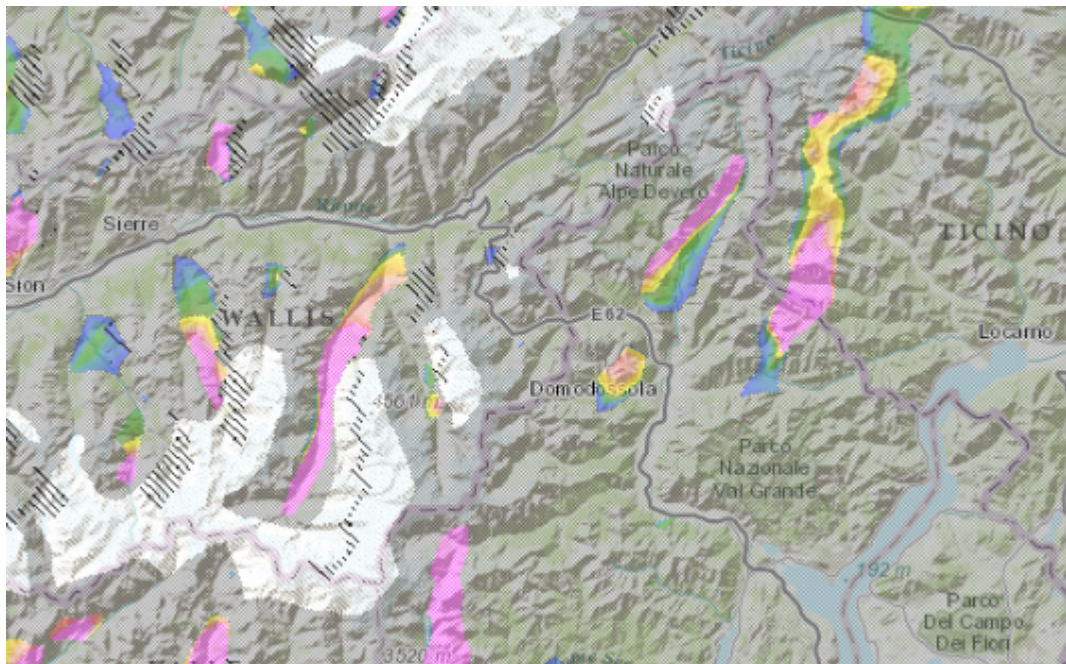
Updraft + wind 3D

Ridge lifts and wave lifts where color denotes wave, ridge or convergence updraft strength and wind direction is shown by arrow.
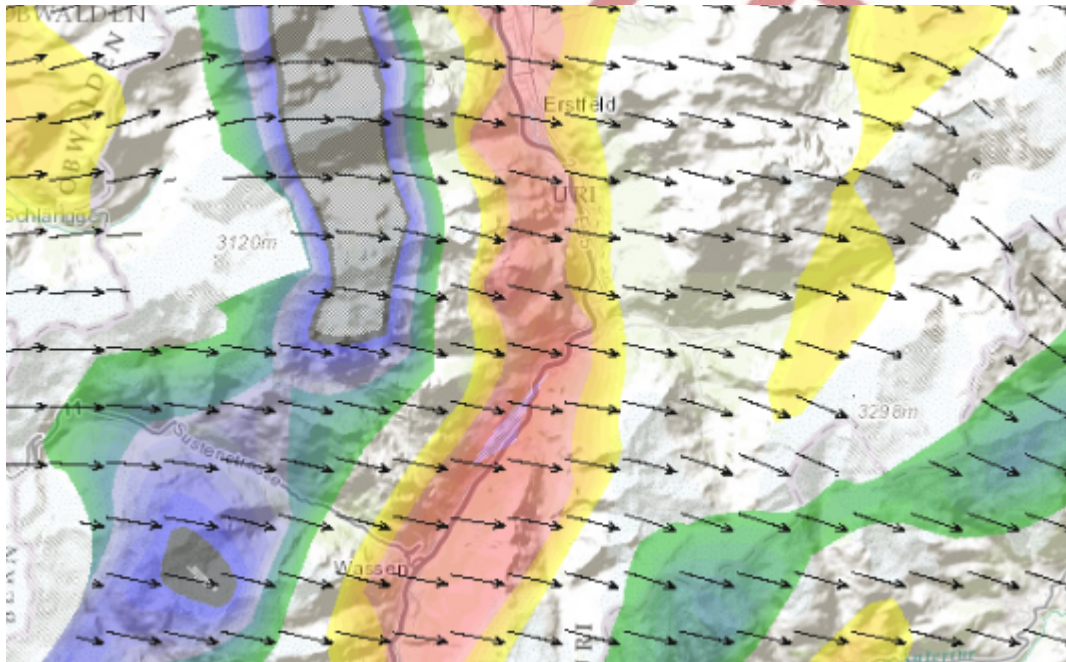
Precipitation

Look at Gliders section

Height of BL top

Thermal (Boundary) layer top altitude. For wave situation in winter it usually equals to ground altitude of model, for thermal and wave mixed situation it could be useful to see where cloud top is.

Wind BL top

Wind at boundary layer top, summer situations where thermals are active and some upper wind is quickly shifting near cloud top.

BL Integrated Cloud Water

Clouds (non Cumulus or thick Cu coverage) in Boundary Layer. Literally expressed in grams of water. Note that when boundary layer is non-existing it may be not very appropriate.

Above-BL Integrated Cloud Water

Cloud water amount above boundary (thermal) layer, usable for judging about cloud strength.

non-Cu cloudbase AGL

Cloud base altitude of clouds which are not thermal by their origin.

BL Explicit Cloud base

Non-Cu cloud base altitude in thermal layer, essentially describing the "leftover clouds" altitude in mountain situation.

Relative humidity

For checking the altitude where RH is near 100% and cutting the mountains.

Path and Point tools are not working with this map.

TOA OUTGOING LONG WAVE

The same as SAT IR Comparable at Gliders section. Best description of higher level cloud coverage.

Cu cloudbase at max spread

Look at Cu optimistic maps at Gliders section

Cu Cloud Height

Look at Cu Thickness maps at Gliders section

Normalized Sfc. Solar Radiation

Percentage of sun light reaching the ground, compared to full bright transparent atmosphere. Note that this is linear to energy, whereby human eye perceives sunlight quite exponentially.

Buoyancy/Shear Ratio

Look at Gliders section

Explicit 3D Clouds

Look at Gliders section

General

Precipitation

Every kind of water falling from sky – rain, snow, etc. Note that scale is transparent near zero as sometimes the nominal rain is not very important. Note that for nice summer day clouds the precision depens on resolution. 1Km map usually shows Cumulus clouds raining, but 5km is mostly not showing it.

Normalized Sfc. Solar Radiation

Percentage of sun light reaching the ground, compared to full bright transparent atmosphere. Note that this is linear to energy, whereby human eye perceives sunlight quite exponentially.

Thunderstorm

It shows the energy contained in atmosphere (CAPE). Where exactly it goes to thunderstorm is dependent on season and latitude.

Temperature 2m

Air temperature at 2m altitude as measured by meteo stations
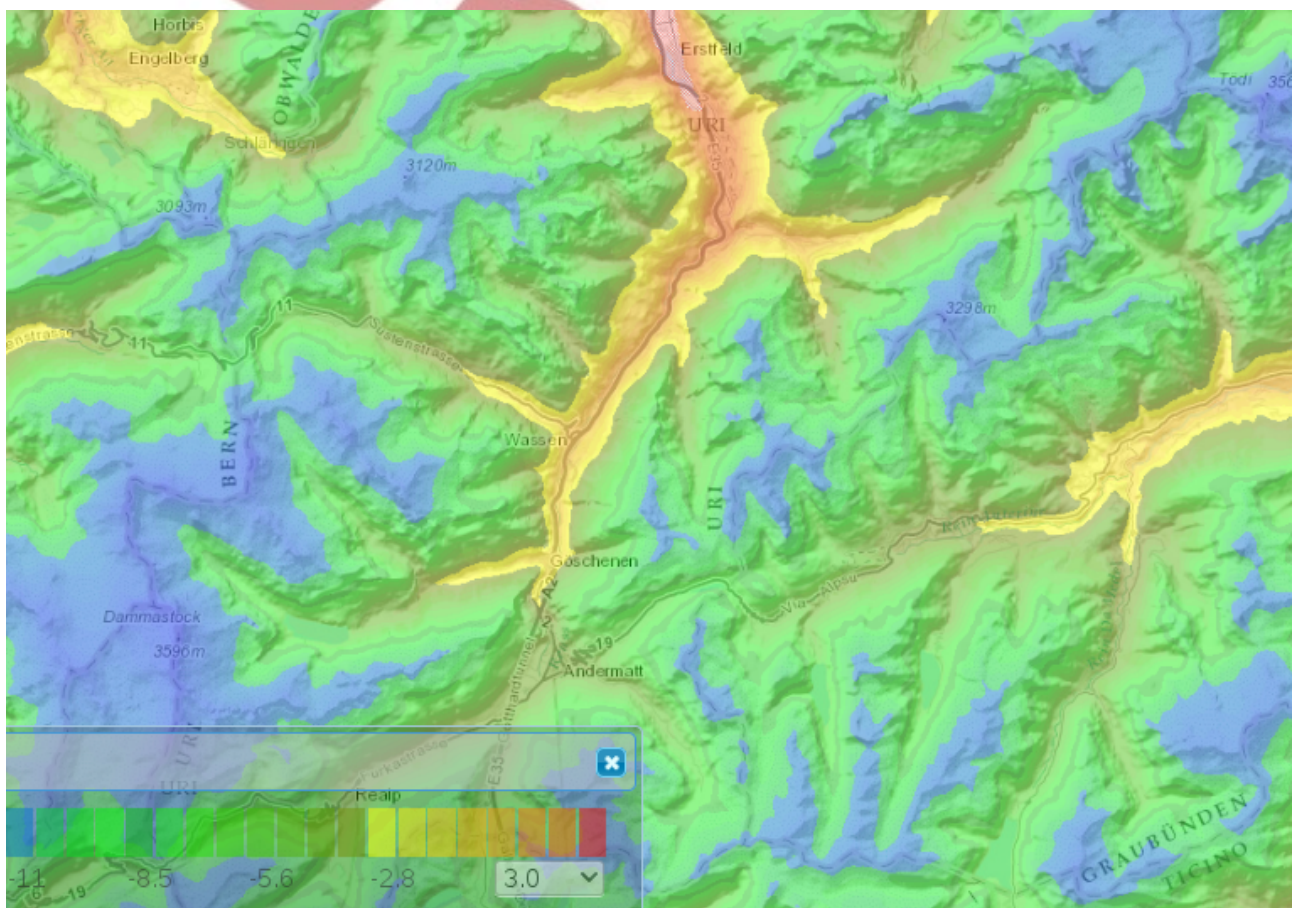
Relative humidity at 2m

Relative humidity at 2m altitude as measured by meteo stations.

Frost

Surface skin temperature fitted with scale to detect ground frost

Surface tmp

Surface skin temperature fitted with scale of human comfort

Wind @ 10m

Wind comparable to meteo station measurements.

Note that this is corrected by altitude in mountain areas.

Point and Path tools are working only without high resolution postprocessing.

Snow Cover

This is also corrected with higher resolution post-processing model, so for subtle situation with near zero snow coverage it needs some common sense.
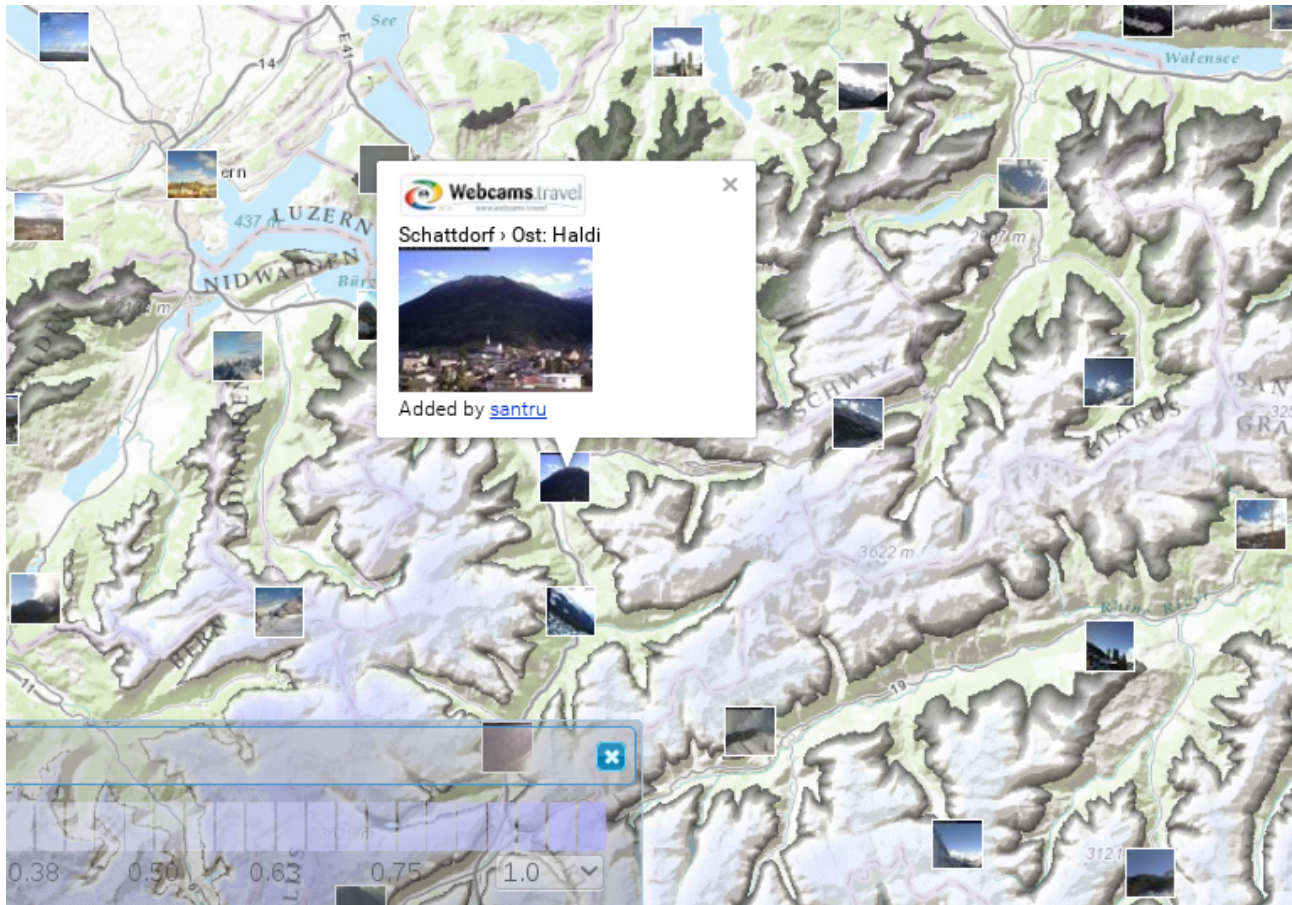
Agriculture

Precipitation

Look for General section.

Every kind of water falling from sky – rain, snow, etc. Note that scale is transparent near zero as sometimes the nominal rain is not very important. Note that for nice summer day clouds the precision depens on resolution. 1Km map usually shows Cumulus clouds raining, but 5km is mostly not showing it.

Moisture on plants

Moisture on plants due to rain or morning condensate. Useful for to see when average crop is

average dry. As the model does not know what kind of plant is growing there, you need to develop your own sense of relationship to reality here.

Temperature

Temperature of air at 2m altitude, comparable to meteo stations

Surface temperature

Ground (plantation top) temperature at human comfort range

Frost

Ground (plantation top) temperature at scale for easy detection of near-zero temperatures

Thunderstorm

It shows the energy contained in atmosphere (CAPE). Where exactly it goes to thunderstorm is dependent on season and latitude.

Wind @ 10m

Wind comparable to meteo station measurements.

Note that this is corrected by altitude in mountain areas.

Point and Path tools are working only without high resolution postprocessing.

Humidity at 2m

Relative humidity at 2m altitude as measured by meteo stations.

Ham Radio

Inversion 3D

Inversion in scale near troposphere. Note that first inversion from bottom of scale is marked and inversions out of scale are not represented, so change of scale is needed for them.

Tropo Duct Count

Count of inversions in atmosphere, together with some magic. Troposphere radio propagation depends on continuity and gap altitude between those inversions. So you should look for continuous uniform area.
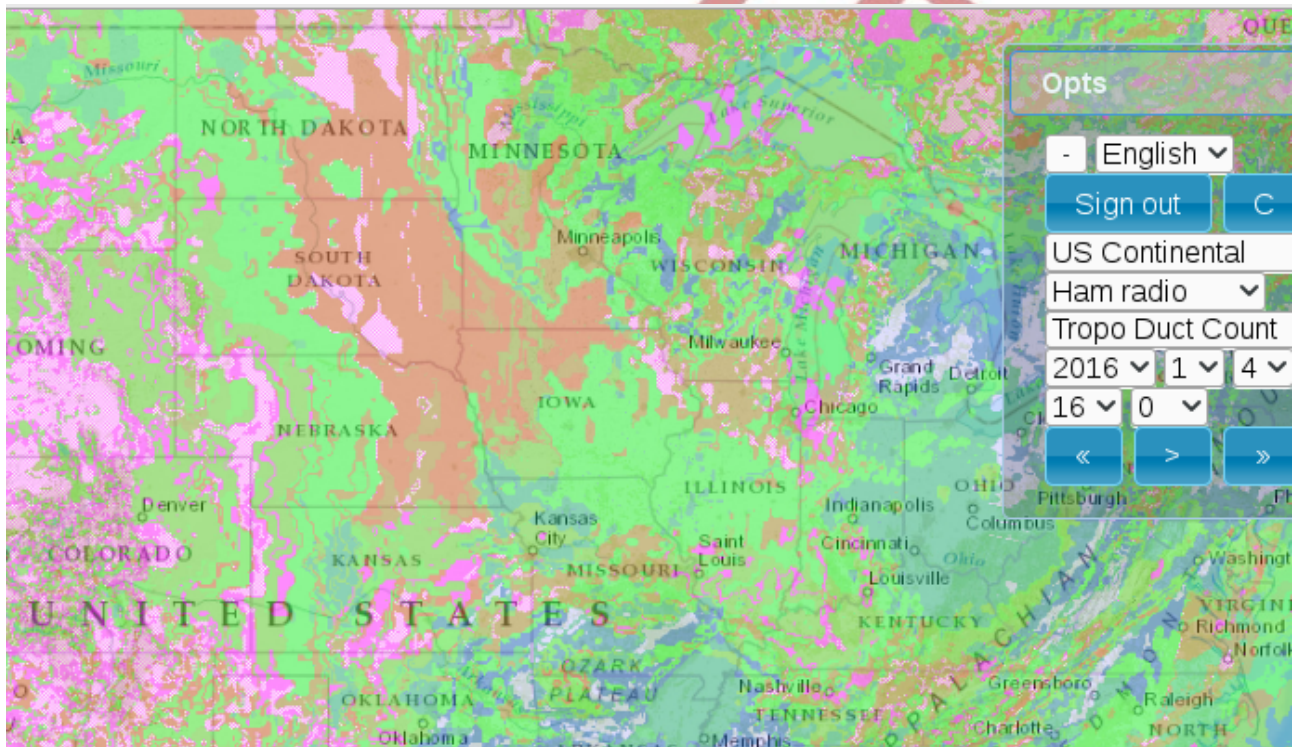
All variables

Most of WRF internal variables and most of RASP variables are here in sporadic list if someone wants to look at. Some 3D variables have plain wrong vertical scale and most of variables miss the correct scale setting, so you need to set the scale first.

test

Maps that are in development stage or by some reason not ready for to be deployed.

Usage scenarios

Gliding

Potential flight distance for day

The easiest would be to start looking at PFD Local, which calculates 6 hour potential flight distance. If high-resolution map is available, better is to draw Path on XC-Speed map, as this predicts speeds with cloudstreets taken into account better. For average XC flight you could also see the X-Country speed at early afternoon, to save servers workload. For flights exceeding 6 hours you might want to check PFD twice, and also see the thermalling height AGL graphs in Point and Path tool for early morning and evening, to understand difficulties associated with them.
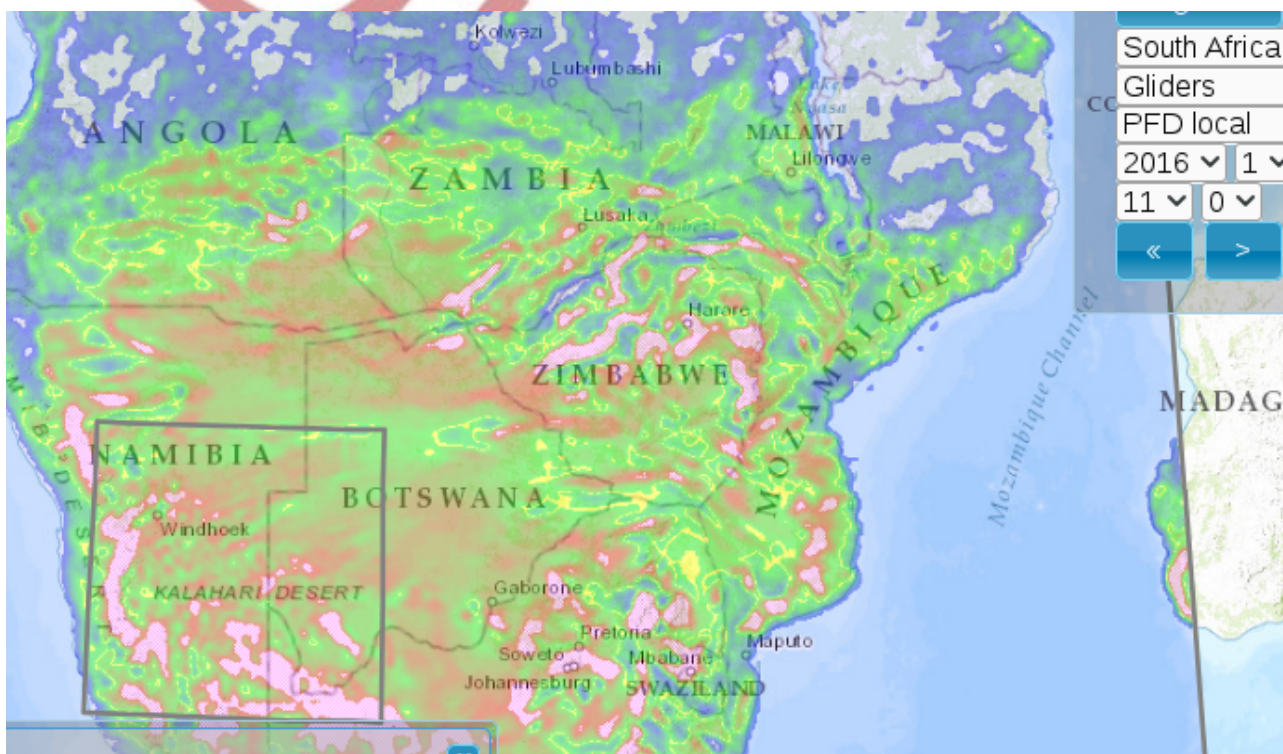

Takeoff time

Launch time is best determined from using Point or Path tool with Thermalling Height AGL and Thermal Updraft Velocity maps. For strong thermal days, where onset is straight and fast, it is exact to precision of ten minutes.

For lousy day competition grid launch time there is also the XC-Speed to be seen for first leg of route and other details which consider risks and other factors outside weather scope.

Note that starting at 10:00 is possible for single glider. But 12:00 is preferred for bigger operation:
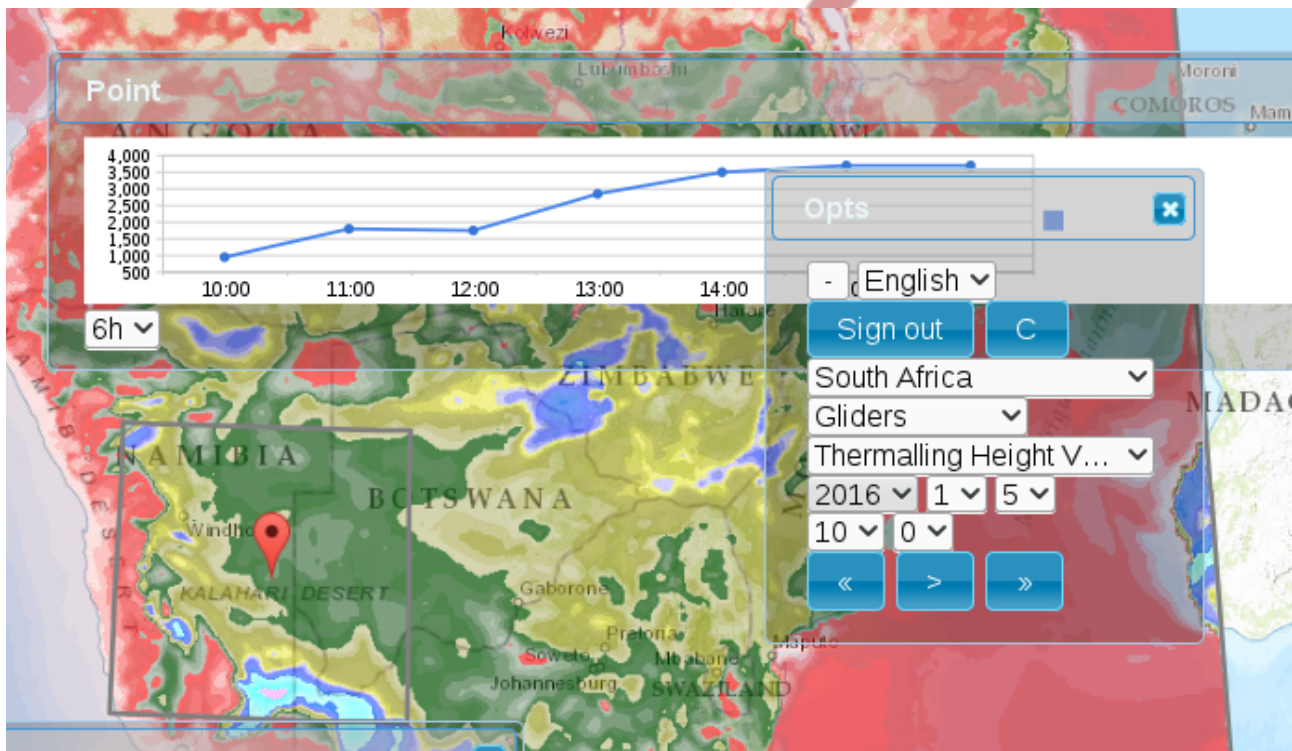

Maximum XC flight path search

Easiest is to use PFD Local map to see potential flight distance. On high-resolution maps there is direction of cloudstreets which nicely corresponds to suggested direction of the task.

So you could key in your glider parameters at LD panel, select XC-Speed map and then draw the task at Path tool. After drawing, the statistics panel in Path tool, under "+" shows average of XC-Speed for the task. Then drag path endpoints around with mouse to understand the difference. Of course the tool is not perfect and you need to use some experience and common sense to understand how much the cloudstreet and overflight speeds may variate in real life.

It is possible to do the same with PFD Local rather than XC-Speed, but it is slower and results in different type of averaging over local maximum speed.

Soundings

The site does not have soundings. Sounding represents weather in point, which is quite misrepresenting. Instead I suggest to take the ¼ view of 4 variables, put the Thermals+, Inversion, Thunderstorm and boundary layer wind there and you get the same amount of information not for the spot, but for whole area.
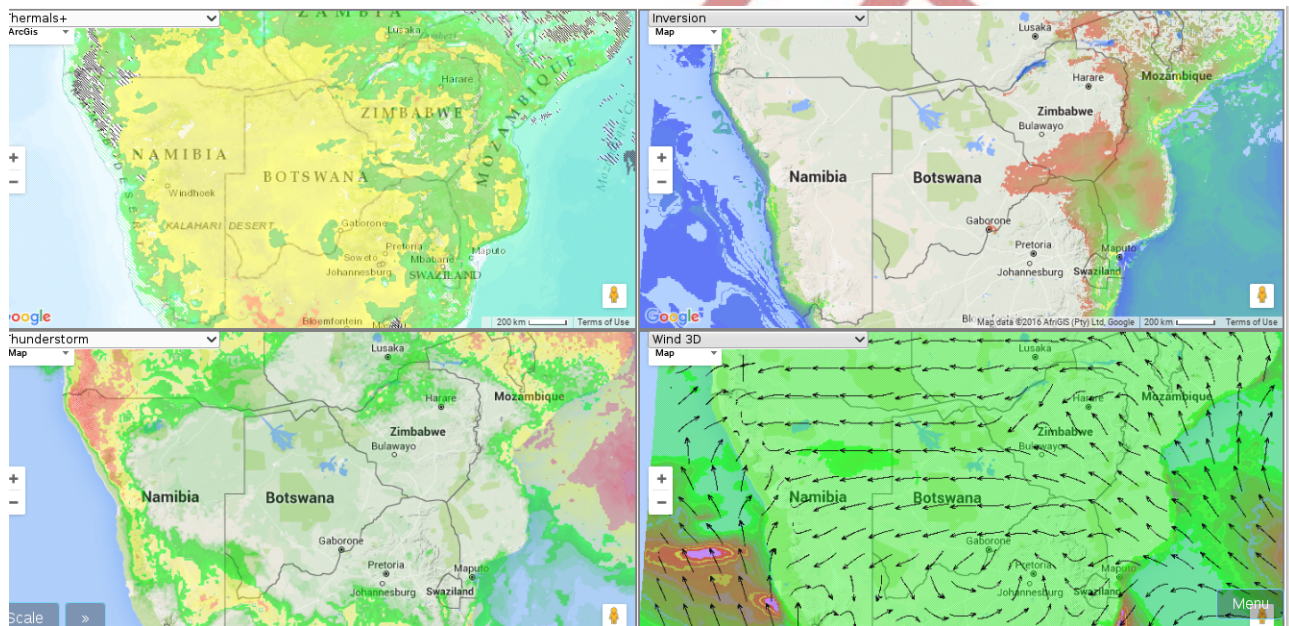
Thunderstorms

For usual thermal day thunderstorms it is easiest to see the Thermals+ map on high resolution simulation, where thunderstorms are visible explicitly as big black striped areas. For to be certain the CAPE map could be seen in parallel in ¼ view or for low resolution simulations.

Explicitly simulated thunderstorms are usually forecasted with precision of 50..100km and 1..2 hours, so it needs some experience to get it right.

Breeze detection

Breeze is to be detected on Wind @10m map in conjunction with Thermalling height AGL map, where you could see breeze cutting off thermals.

Paragliding

Find launch site

"Ridgelift with wind direction" may be a good option to find places where wind direction fits with launch site. Other option is "Wavelifts spots" map, with minimum sink at LD panel adjusted accordingly. Minimum sink for situation depends on simulation resolution and mountain slope, so it need some experience. If using ¼ view, add XC-Speed and Thermal layer average wind to picture, to get best overall view.
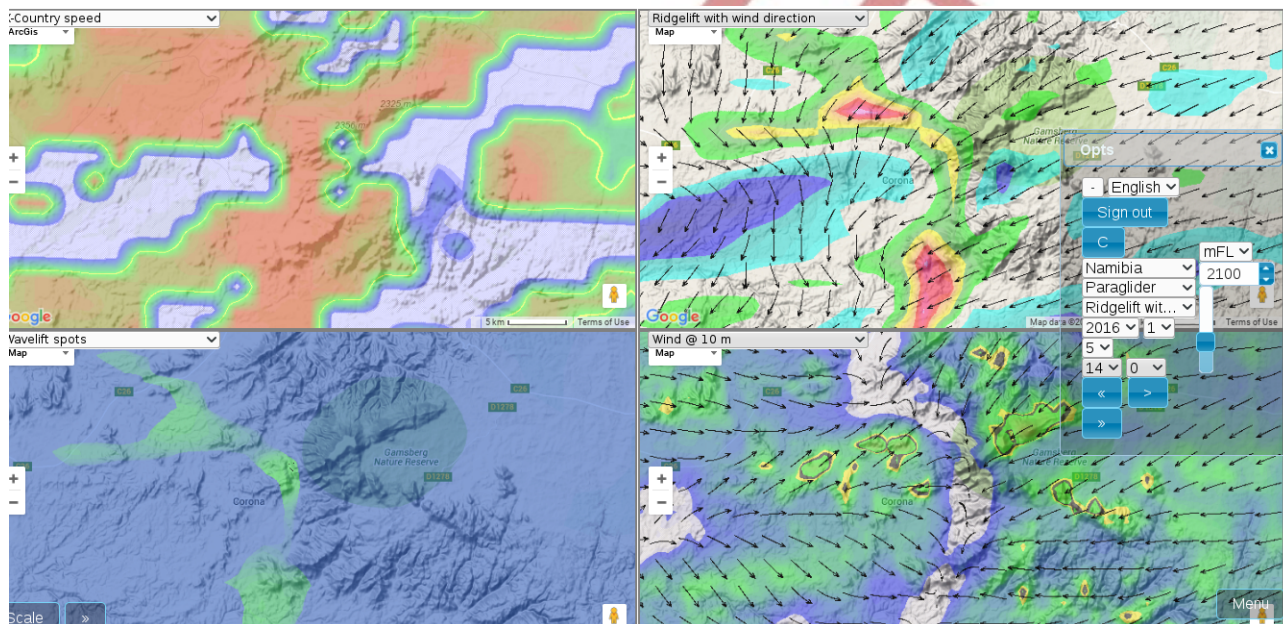
Find max XC flight path

Look at Gliders section first.

Additionally, for paraglider pilots to note: XC-Speed graph at Path tool shows the speed with boundary layer average wind taken into account. So the average speed may be high, but for some part of route speed may be negative, making the whole task unusable.

Find dangers on flight path

There are several maps associated with hazards on the way - "Thermal+ridge strength" also shows the rain and thunderstorms, "Takeoff turbulence" and "Wind @10 Gusts" are also meant for showing hazard areas. But pilot needs to use common sense and visual sight as the first and nearly only decision making tool.

Wave Flight

Planning wave flight

To plan a wave flight first take the low level climbs map (at high resolution simulation) to max tow altitude, to see if there are connected climbs from for example 1200meters MSL to 3000m MSL. In parallel there is to see relevant cloud coverage maps – either Normalized Surface Sun + TOA OUTGOING LONGWAVE or boundary layer and above boundary layer cloud water. This gives the idea about overall cloud situation and possibility of taking off.

As quite often secondary wave is not connected to primary and highest lifts are beyond main wave, then you might want to check those Climb maps for different start altitudes.

For higher flights you might want to walk trough Relative humidity with scale set near 100%, to anticipate possible consequences of small changes of real life.

Ridge flying

There is Updraft + wind 3D map which shows updraft (ridge,convergence,wave) strength and wind direction. As the correctness of this information depends greatly on mountain shape and simulation resolution, it may take lot of days of practice to start feeling the relationship with reality.

Agriculture

Dry plantation

For planning agricultural works it is often interesting to know when plantation would be dry. There is map for that in Agriculture section.

Frost

Night frost is predicted quite exactly with the model.

Sailing

Wind direction near coast.

Wind is quite changing in near-coastal areas. For sailing it is good to understand daily wind patterns. Wind at 10m altitude shows that for high-resolution maps – areas where wind twists in small bays.

Ski resorts

Snow coverage

Snow coverage map in General section is showing snow coverage border with some altitude correction for mountain areas. It is currently work in progress, so there are some inconsistencies.

Surface temperature

Snow surface temperature is showing altitude corrected surface temperature. For to predict temperature of zero degrees some experience to correct the picture by slight amount is needed.

Amateur radio

Troposphere duct index.

It is a map developed for fun, counting inversion layers and their properties in atmosphere, for UHF radio propagation forecast in upper air, called tropo-duct.

Alphabetical Index

Bibliography