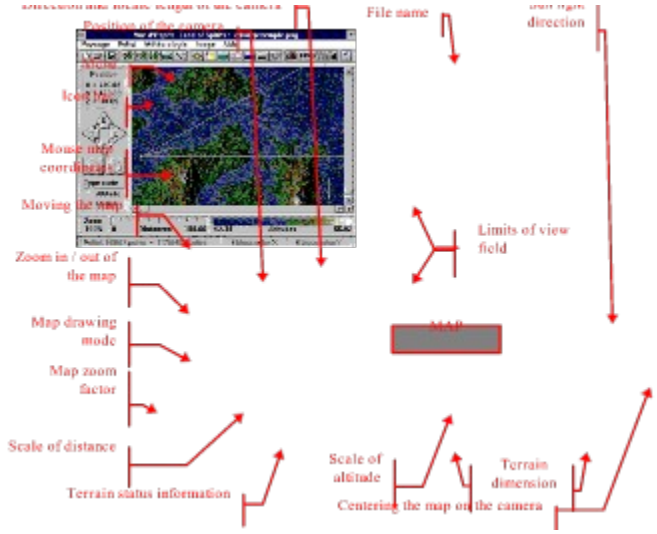
Dashboard :

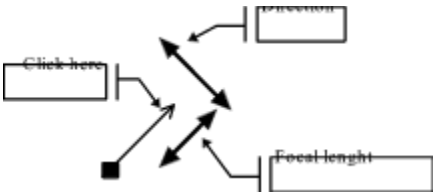
The Dashboard is the main window of Vue dEsprit.

If you look for help concerning the menu items, click here.



Position of the camera : this square indicates the position of the camera. Click on the square and move the mouse while keeping the mouse button pressed to modify the position of the camera.
Note that you cannot modify the altitude of the camera in this way. Modify the altitude thanks to the menu Picture - Parameter of the camera.

Direction and focal length of the camera : this arrow indicates the direction and the focal length of the camera. Click on the end of the arrow and move the mouse by keeping the button pressed to modify the direction in which the camera points and the focal length of its lens. Turn around the camera to modify its direction, move away from it to increase its focal length :



Note that you cannot modify here the pitch of the camera. Modify the pitch thanks to the menu Picture - Parameters of the camera.

File name : the title of the window indicates the name of the landscape which has been loaded or saved last. When you create a new landscape, by default, its name is : "noname.psg".

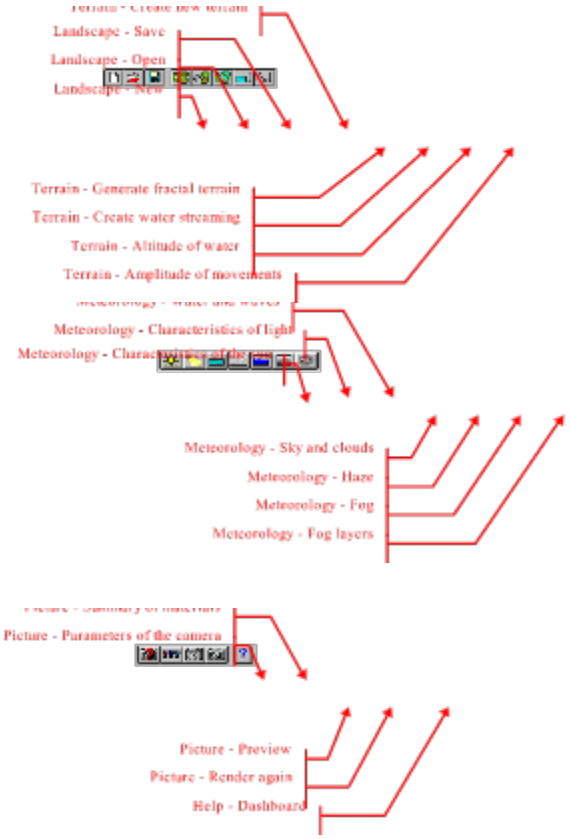
Direction of the sun light : this arrow indicates the direction of the sun light. Click on the end of the arrow and move the mouse while keeping the button pressed to modify the direction of the sun light.

Note that you cannot modify here the pitch of the sun light. Modify the pitch thanks to the menu Meteorology - Characteristics of the sun.

Menu : select an item by clicking on the menu. To understand the effect of each menu, consult the chapter Menu item.

Icon bar : icons are short cuts to rapidly access commonly used menu items. Here are

the equivalencies of the icons :



To get information concerning the icon effects, consult the Menu items.

Mouse map coordinates: when the mouse pointer is above the map, this box displays the position of the mouse in map coordinates. The indicated altitude is the terrain altitude at this point.

Moving the map : press the button marked with N to move the map to the North (that means, upper), E to move to the East...You can also move the map with the scroll bars to the left and under the map, but the buttons enable you to move out of the terrain, unlike the scroll bars.

Zoom in / out the map : use these buttons to look at the map closely (to see details in the terrain) or from far away (to see the whole terrain). The zoom factor of the map is called zoom.

Drawing mode of the map: select **Altitude** to display a map in which the terrain altitudes are represented with colors, or select **Shaded** to display a map with shadows. You can modify the color of the map and its display quality thanks to the menu Landscape-Preferences.

Map zoom factor : indicates the zooming factor of the map. To change it, use the button Zoom in / out of the map.

Ruler of distances : indicates the length of the graduated segment, in coordinates on the map. This length is linked to the magnifying factor of the map.

Terrain status information : displays information concerning the terrain ; if no terrain is defined, it displays No terrain defined, if not, indicates the number of points (number of block x 128^2) and the number of polygons in the terrain.

Ruler of altitudes : indicates the correspondence between the terrain altitudes and the colors used in the map. It displays the lowest altitude of the terrain (on the left), and the

highest altitude (on the right).

Dimensions of the terrain : reminds the dimensions of the terrain. It is expressed in number of blocks.

Centering the map in the camera field : re-positions the map so that the camera appears in the middle of the screen.

Limits of the view field : both lines represent the limits of the terrain area that will be seen by the camera. This limit is linked to the focal distance and to the position / direction of the camera.

General overview of Vue d'Esprit :

Welcome to Vue d'Esprit.

With Vue d'Esprit, create amazing pictures of unexisting lands. Build imaginary worlds and take snapshots of them as if they really existed.

Create a terrain, dress it up with materials, add meteorological effects, frame with the camera, and... render !

You will get pictures of photorealistic quality : Vue d'Esprit uses a powerfull Ray-Tracing render engine. It handles exactly elaborate effects such as reflections, transparency, fading out, cast shadows, haze and fog, and also fog layers...

Tutorial :
Discover in a seven easy steps the broadlines of creating pictures with Vue d'Esprit.

How to ? :
Frequently asked questions, exercices and advanced techniques to improve your pictures.

Vue d'Esprit versions :
Versions of Vue d'Esprit, how to order, conditions of use, acknowlegements...

Menu items :
Description of the effects of each menu item and the corresponding dialog boxes.

Dashboard :
Description of the function of each control of the main window of Vue d'Esprit.

Check out the official Vue d'Esprit site on the Internet at the following URL :

http://ourworld.compuserve.com/homepages/Vue_d_Esprit

You'll find pictures, landscapes, materials... to download, but also hints and tips on getting better pictures. We are very keen on seeing what you do with our software, so don't forget to send your personal creations, and of course, comments and suggestions.

Vue d'Esprit versions :

This is Vue d'Esprit version v1.2.

Vue d'Esprit exists in two versions : a free demo version that enables you to discover the software, and a commercial version that you can get on order. Please read the following information concerning software licenses and liability.

To order the commercial version of Vue d'Esprit, select one of the following options available from your country, then complete the order form and send it together with your payment.

To display the order form, click here.

Detailed information on ordering the commercial version :

(Please allow at least 1 week for delivery)

Credit card :

Send (or fax to : **International + 33 1 43 55 36 71**) the completed order form together with your credit card information (Card number + expiration date). Your account will be charged US$ 55.- + 5.- (S&H) per license. Please note that only Visa, MasterCard and EuroCards are accepted. Don't forget to sign the order form...
Important : do not send your credit card information through e-mail, since this is not yet secure.

From the United States :

Send the completed order form together with either :
- a personal check or cashier's check drawn on a US bank in the amount of US$ 55.- + 5.- (S&H)
- an international money order in the amount of US$ 55.- + 5.-
- a check in French Francs drawn on a French bank (FFr 280.- + 20.-).
- cash : US$ 60.- (no coins please), at your own risk!

From Europe :

Send the completed order form together with either :
- an Eurocheque in French Francs, in the amount of Ffr 280.- + 20.-
- an international money order in the amount of US$ 55.- + 5.- (S&H) or Ffr 280.- + 20.-
- a check in French Francs drawn on a French bank (Ffr 280.- + 20.-).
- a check in Sterling Pounds drawn on a UK bank (UK£ 35.-).
- cash US$ 60.- or FFr 300.- (no coins please), at your own risk!
- a simultaneous transfer of FFr. 280.-+20.- to the following bank account : 30066 / 0121 / 06210184302 / Key 22 (CIC M Paris St Michel, France). Please don't forget to write on the coupon (small part) your name, address and country!

From Canada or Australia :

Send the completed order form together with either :
- a check in CAN$/AUS$ in the amount of CAN$/AUS$ 83.- (drawn on a Canadian / Australian bank)
- cash : CAN$/AUS$ 83.- (no coins please), at your own risk!

On CompuServe :

- In WINCIM, click on the traffic light icon and type SWREG.
- This brings you to the Software registration forum.
- Choose option 2, Register Shareware. The price per registration is US$ 70.-

- In the search criteria, choose option 1, the REGISTRATION ID.
- The registration ID of Vue d'Esprit v1.2 is 14129.
- Make sure the displayed program description fits to Vue d'Esprit.
- You are prompted to enter your address and the number of copies you want.
- Your CompuServe account will then be charged with the registration fee, and we'll be noticed of your registration.

Software Licence

Please read the following lines carefully before using this software. If you disagree with any of the following, you are not allowed to use this software. You MUST then delete it immediately.

Demo version

You have the right to test the demo version for a period of one month. You are allowed to copy this demo version (and ONLY the demo version) and give it to any other person, as long as it is not modified in any way. Under modifications is understood the changing, adding or removing of any files of this package without the author's written permission. You are NOT allowed to pack this program together with a commercial program or a book. Shareware dealers are allowed to sell the demo version for a small fee (around US$ 10.-). You are encouraged to put this program on as many BBS systems as possible. The distribution on CD-ROM is also permitted, as long as the original files are not changed in any way. Please contact us if you want to distribute the program with a different installation program, changed files etc.

Use of this software after the trial period of one month is in violation of international Copyright law ! It is also unfair to the author, who has spent hundreds of hours developing this program.

The demo version was designed to enable you to get a grasp of Vue d'Esprit's performance. To go further in the synthesis of artificial landscapes, and in any case after one month, you will have to order the commercial version.

Commercial version

This program is neither freeware nor public domain. Use after the 30 day trial period requires registration. When you register, you will get a personal license for the commercial version of Vue d'Esprit v1.2, allowing you to generate incredible pictures. The commercial version renders bigger pictures than the 320x240 limit of the demo version, it handles reflections and refractions in the water, and computes correctly cast shadows. You will also be informed of future versions of the software, and will be granted special upgrading fees. The fee is only (US$ 60.- personal check or cash including handling fees) for a personal licence. See above the details on registration.

The commercial version of Vue d'Esprit may be installed on as many computers as desired, as long as it is ONLY running on one at any one time (I.e. one installation at home and one at the office used by the same person). The usage by multiple people at the same time (on multiple computers) requires additional licences.

Multiple licences allow an institution, company or school to install the program on multiple computers or on a server. It must be guaranteed that the program does not run on more machines at the same time than there are licences purchased. All licences are issued to the same (company) name, which appears in the program's About Vue d'Esprit menu item. Each additional licence also allows a single user to use the program at home.

Warning : it is against the law to make copies or distribute by any means the commercial

version of Vue d'Esprit. Trespassees will be prosecuted to the highest extent permitted by the law.

Liability

The author disclaims all warranties, either express or implied concerning this software or the use of this software, including, but not limited to implied warranties of merchandability and fitness for a particular purpose. Using this software is at your own risks, and in no event shall the author be liable for any damage whatsoever (including without limitation, special, incidental, consequential, or indirect damages for personal injury, loss of business profits, business interruption, loss of business information, or any other pecuniary loss) arising out of the use of or inability to use this software, even if the author has been advised of the possibility of such damages. In any case, the author's entire liability under any provision of this agreement shall be limited to the amount actually paid by you for the software.

Please test this program with non-critical data. We cannot guarantee the safety of your data. Especially new operating systems like Windows NT or OS/2 can cause trouble. Should you detect errors before registration, you accept them if you register. Any description of bugs will be accepted, but we cannot guarantee that we will be able to correct them.

Liste of supplied files :

You will find the following files in the Vue d'Esprit directory :

CANYON.FLT	Canyon profile filter for use as terrain altitude distribution.
FISSURES.FLT	Filter changing noise into lines ; can be used to create cracks.
COUCHANT.CLR	Setting sun sky color gradation, yellow at horizon, blue at zenith.
CIEL.CLR	Blue sky color gradation. It is the default sky color.
ROCHER.CLR	Natural brown rock color gradation.
STRATES.FNC	Function implementing tilted strata.
BRUIT.FNC	Function with one smooth noise layer.
BRUIT2.FNC	Elaborate noise function comprising two smooth noise layers.
BRUITCLM.FNC	Low amplitude, smooth noise function.
FRACTALE.FNC	Function with one fractal layer.
ROCHER1.MAT	Brown rock material with multiple cracks.
ROCHER2.MAT	Dark red rock material.
ROCHER3.MAT	Brown rock material with very rough surface.
ROCHER4.MAT	Beige rock material with horizontal strata.
ROCHER5.MAT	Another beige rock material with horizontal strata.
ROCHER6.MAT	Mixed material : rocks with spots of vegetation.
ROCHER7.MAT	Black marble material using the picture MARBRE1.GIF.
GRANITE.MAT	Pink, white an black granite material with cracks.
ARDOISE.MAT	Gray slate rock material.
NEIGE.MAT	Snow material.

NEIGEUX.MAT	Mixed material : rocks with snow at high altitudes.
SILLONS.MAT	Sand material covered with undulating furrows.
STRATES.MAT	Mixed material : two different rock materials forming strata.
NAPPE.MAT	Fog layer material to produce accumulated fog.
DEFAUT.MAT	Default terrain material : white sand.
EAU.MAT	Default water material : tropical blue - green water.
NUAGES.MAT	Default cloud material : average covering.
MONTAGNE.PSG	Snow covered, mountainous landscape, at dusk.
CANYON.PSG	Canyon landscape dug by an undulating river.
COUCHANT.PSG	Landscape model with setting sun ambiance.
GRIS.PSG	Landscape model with grey and rainy ambiance.
DESERT.PSG	Landscape model for deserts.
MONTAGNE.BMP	640x480 rendering of MONTAGNE.PSG landscape.
CANYON.BMP	640x480 rendering of CANYON.PSG landscape.
CANYONBS.BMP	256x256 picture, basis of the CANYON.PSG terrain.
TUTOR_01.BMP	320x240 rendering of the first step of the tutorial.
TUTOR_02.BMP	320x240 rendering of the second step of the tutorial.
TUTOR_03.BMP	320x240 rendering of the third step of the tutorial.
TUTOR_04.BMP	320x240 rendering of the fourth step of the tutorial.
TUTOR_05.BMP	320x240 rendering of the fifth step of the tutorial.
TUTOR_06.BMP	320x240 rendering of the sixth step of the tutorial.
TUTOR_07.BMP	320x240 rendering of the seventh step of the tutorial.
FRACT1_1.BMP	128x128 picture of fractal noise.
MARBRE1.GIF	286x189 picture of white striped black marble.
MARBRE2.GIF	I287x190 picture of gray striped white marble.

Acknowlegements :

This software is based in part on the work of the Independent JPEG Group, for picture input and output routines. Contact the IJG on the net at jpeg-info@uunet.uu.net for more information.

Uninstalling Vue d'Esprit :

To uninstall Vue d'Esprit, delete the files VUE.INI and VUE.CFG from the Windows directory and delete the directory in which you installed Vue d'Esprit.

Ordering Vue d'Esprit v1.2

To order Vue d'Esprit v1.2, print the following form, fill it in, and send or fax (card order only : Int'l 33 1 43 55 36 71) it, together with your payment (card information, or a US check (personal or cashier's check) drawn on a US bank (US$ 60.-), or US$ 60.- cash, or a check in French Francs (FFr 300.-), or an Eurocheque in French Francs), to :

Vue d'Esprit Ltd,
Software Registration,
6, rue du Général Guilhem,
75011 PARIS,
FRANCE

For more details on how to order, and special facilities to order from your country, please refer to the paragraph Detailed information on ordering the commercial version. You will also find information on ordering from Compuserve.

..... Cut here

Vue d'Esprit v1.2 Order Form

Please send me a copy of the commercial version of Vue d'Esprit - Land of Spirits v1.2, complete with reflections, refractions, cast shadows and hi-res pictures.

Name : _____

Company : _____

Address : _____

ZIP Code : _____ City : _____

State/Country : _____

Phone/FAX : _____ / _____

E-mail-address : _____

Language : ( ) English ( ) French Number of copies : _____ x US$ 60 = _____

Payment : ( ) Check ( ) Cash
( ) Credit card : N° : _____ Expires : _____

Where did you get Vue d'Esprit (Web site, CIS forum, Magazine...)

_____

Comments, suggestions...

_____

_____

_____

_____

Date : _____ Signature : _____

_____

Description of the menu items :

Landscape Menu :

New
Open...
Save...
Save as...
Preferences...
Quit

Terrain Menu :

Create a new terrain...
Load a terrain...
Save terrain...
Generate a fractal terrain...
Transform terrain into picture...
Transform picture into terrain...
Copy terrain
Paste into terrain
Create water streaming...
Add a function...
Erode terrain...
Altitude of water...
Amplitude of movements...
Terrain material...

Meteorology Menu :

Characteristics of the sun...
Characteristics of light...
Water and waves...
Sky and clouds...
Haze...
Fog...
Layers of fog...

Picture Menu :

Parameters of the camera...
Anti-aliasing...
Summary of materials...
Preview...
Render picture...
Re-render
Display last picture

Help Menu :

General overview
Tutorial
How to ?
(Menu items)
Dashboard

Version...

Create new terrain... :

In this dialog box, specify the dimensions of the terrain you want to create.

Indicate the number of blocks constituting the terrain along the X axis and the Y axis. A good value is 3 by 3, which corresponds to a terrain constituted of approximately 300.000 facets.

When you click **Ok**, Vue d'Esprit creates the terrain by initializing all the altitudes to 0, and then suggests you to generate a fractal terrain, which means, to fill the altitudes of the terrain you have just created by a fractal process.

The terrain displays in the map of the Dashboard.

Generate a fractal terrain... :

This dialog box enables you to specify the calculation parameters of a terrain . This calculation is based on a mathematical process running with fractals.

The seed is a random number that Vue dEsprit will use to generate the terrain. The same seed will always lead to the same terrain, but you cannot forecast the terrain you will get.

The horizon profile gives you an idea of the profile of the terrain. A new horizon is displayed any time a parameter is modified.

The distribution of the noise specifies the distribution of perturbations added to the terrain at each iteration step. By default, the noise is distributed randomly around 0.5, which means that bumps and ditches have the same statistical characteristics. By modifying this distribution, you can get interesting effects.

Modify the distribution of the perturbations by changing the corresponding filter. If the specified distribution is not balanced (i.e. asymmetrical filter), the terrain may have a tendency to swell or retract.

The altitude distribution is, by default, centered around the sea, which corresponds to a terrain in which bumps and holes have the same shape. By modifying this distribution, you can have interesting effects.

Modify the altitude distribution by changing the corresponding filter. You will associate to each altitude of the terrain, proportionately to the value of the filter, a new altitude. Depending on the filter, you will get canyons, plateau...

Amplitude of perturbations : the fractal process is iterative. For each new iteration, Vue d'Esprit adds perturbations to the terrain, the scale of which depends on the iteration step. The higher the iteration step, the finer the perturbations.

Vue d'Esprit enables you to specify the average perturbation amplitude for each iteration step. Values comprised in 0 to 3 are reasonable. To understand correctly the iteration process, indicate 0 for each iteration step, then, going from the smallest step (on the left) to the highest step (on the right), indicate 1. Watch for each step the horizon profile.

To accept the parameters, click **Ok**. Vue d'Esprit fills in the terrain altitudes. This operation, which requires many calculations, can be interrupted at any time with the escape button. When the calculation is finished, the terrain displays in the map of the dashboard.

Transform picture into terrain... :

Vue d'Esprit enables you to transform the picture you want into a terrain.

Choose the picture you want to transform into terrain and click **Ok**. Vue d'Esprit converts the picture into a terrain and displays it in the map of the dashboard.

The picture is enlarged horizontally and vertically so as to adjust it to the terrain dimensions.

The altitudes of the terrain are calculated depending on the luminosity of the picture. The lighter a point of the picture, the higher the corresponding point of the terrain and vice versa.

Transform terrain into picture... :

Vue d'Esprit enables you to save a terrain as a picture. The altitudes of the terrain are converted into 256 different gray levels. The higher a point of the terrain, the lighter the corresponding point of the picture.

The created picture will have the same dimensions as the terrain (128 times the number of blocks, that means 384x256 for a terrain containing 3x2 blocks).

Choose the picture in which the terrain will be saved and click **Ok**.

Copy terrain :

Vue d'Esprit enables you to copy the terrain into the clipboard by transforming it into a picture. It then becomes accessible to other applications and enables you, for example, to modify graphically the terrain.

The altitudes of the terrain are converted into 256 different gray levels. The higher a point of the terrain, the lighter the corresponding point of the picture.

The created picture will have the same dimensions as the terrain.

To use the terrain in an other application, create a picture with the dimensions of the terrain (128 times the number of blocks, that means 384x256 for a terrain containing 3x2 blocks) and paste in the terrain.

Be careful : the terrain defined with a picture only has 256 different altitudes, whereas a terrain generated by Vue dEsprit has 65536 of them. There is a loss when you transform a terrain into a picture.

Paste into terrain :

Vue d'Esprit enables you to paste a picture from the clipboard into the terrain, by transforming the gray levels of the picture into altitudes. You can thus easily exchange the terrain with other applications, to modify it graphically for example.

The picture in the clipboard must be in 256 levels of gray, and must have the same dimensions as the terrain (128 times the number of blocks, that means 384x256 for a terrain containing 3x2 blocks)

The levels of gray of the picture are converted into altitudes. The lighter a point of the picture, the higher the corresponding point of the terrain.

Be careful : the terrain defined with a picture only has 256 different altitudes, whereas a terrain generated by Vue dEsprit has 65536 of them. There is a loss when you transform a terrain into a picture.

When you choose this option, Vue dEsprit converts the picture into a terrain and displays it in the map of the dashboard.

Create water streaming... :

Select this item to simulate the effects of the rain water on the terrain. Vue d'Esprit will create many streams that will dig the terrain.

When you select this item, Vue dEsprit draws the beds of a certain number of streams on the map of the dashboard, then displays the dialog box that enables you to adjust the water streaming options.

If you want to create more streams, click the button **Add streams** as many time as you want.

Indicate an average stream **Depth**: it is the depth of holes dug by the rain water streams. The normal value is 1 ; a bigger value gives deeper streams.

In nature, the way the streams dig the rock depends on the **Rock hardness**. The following drawing presents the profile of the streams depending on the rock hardness :

Select the type of rock by checking the box you want.

Click **Ok**. Vue d'Esprit digs the streams and displays the new terrain in the map of the dashboard.

Add a function... :

You can add to each altitude of the terrain the value given by a function at this point.

To add a function to the terrain, you must define the function that Vue d'Esprit must add, either by clicking the button **Load** (or by selecting this option from the pop-up menu that appears when you press the right mouse button above the picture of the function), either by editing directly the function (double-click on the picture of the function).

Specify the **amplitude** of the modifications brought by the function (in map coordinates).

If necessary, use the filter to modify the way the values of the function change the terrain.

Indicate the scale of the function along the axis X , Y and Z. (128x128x128 is a good value).

Click **Ok**. Vue d'Esprit adds the function to the terrain and displays the new terrain on the map of the dashboard.

Erode terrain... :

Vue d'Esprit can simulate erosion effects on the terrain.

The erosion smoothes the bumps of the terrain as long as their dimensions are smaller than the **Scale** parameter. A good value for the parameter is 3.

The intensity of erosion corresponds to the percentage of bump smoothing.

Click **Ok**. Vue d'Esprit erodes the terrain and displays the new terrain in the map of the dashboard. The calculation of the erosion is very long, especially when the erosion scales are important. It can be interrupted with the escape button.

Water altitude... :

By default, the water is at an altitude of 0. This dialog box enables you to change the altitude of water, which means, to change the visible amount of water in the landscape.

Click **Ok**. The terrain is displayed in the map of the dashboard with the new water altitude.

Amplitude of movements... :

The amplitude of terrain movements characterizes the average amplitude of bumps and holes in the terrain. A small value (less than 1) will lead to a peacefully undulating terrain ; a high value (greater than 1) will lead to a terrain with important movements typical of steep mountains.

If you want the visible quantity of water to stay unmodified when you modify the amplitude of the movements of the terrain, select the option **Modify water altitude consequently**.

Click **Ok**. The terrain displays in the map of the dashboard , with shadows more or less pronounced depending on the terrain movement amplitude selected.

Terrain material... :

This dialog box enables you to indicate the material used to dress up the terrain.

The material currently used is represented in the picture.

To change the material, load a material that exists on the disk with the button **Load** (or select this option in the menu you get when you click with the right mouse button in the picture of the corresponding material), or edit a material (double-click on the corresponding material).

To enlarge or reduce the material displayed on the terrain, the water or the clouds, indicate a **Scale** bigger than 1 (respectively smaller than 1). A scale equal to 1 does not change the size of the material.

This dialog box can stay opened all the time. Your modifications are taken into account immediately. To close the dialog box, click  .

Save terrain... :

The terrain files of Vue d'Esprit have the extension ".rlf".

Indicate the file name and press **Ok** to save the terrain to the disk. You can eventually add a **comment** concerning the terrain.

You will now be able to use this terrain in other landscapes.

If you want to use this terrain in an other application, you can export it under the AutoCad format. To do so, choose the file format**.dxf**, indicate the file name and click **Ok**. You will have to indicate the export options.

Load a terrain... :

The terrain files of Vue d'Esprit have the extension ".rlf".

Indicate the file name and press **Ok** to load a terrain that exists on the disk.

This enables you to load from the disk a terrain already saved.

Click **Ok**. The terrain is displayed in the map of the dashbord.

Selecting a file :

To select a file, you can type directly its name or select it in the file list. To change directory, use the directory list.

When you are satisfied with the file name, click **Ok** or double click its name.

Filter editor:

Description :

Filters are used to represent variable values such as transparency, altitudes, bump depths, ...

Basically, they enable you to transform one number in the range 0 to 1 into another number in the range 0 to 1 following a curve defined by the user. The value given by the filter at a position on the horizontal ruler can be read on the vertical ruler of the curve.

The filters are built from key points, joined by straight lines. You can modify a filter by adding, moving or suppressing key points.

The key points are represented by two cursors and

in the rulers below and on the left of the curve.
All filters start from (0,0) and have a key point on the extreme right of the horizontal ruler (the corresponding cursor cant be moved).

To create a new key point, you can either :

- double-click in the area in which the curve is drawn ; the curve is redrawn to use the new key point that was created at the point you clicked.

- click in the area in which the curve is drawn ; the coordinates of the clicked point appear in the box **Position**. To create a new key point, press the button **Add key point**. The curve is redrawn.

- type the coordinates of the new key point in the box **Position**, then press the button **Add key point**. The curve is redrawn.

You cant create two key points with the same horizontal position.

To move a key point, you can either :

- click one of the key point cursors or

you want to modify, and drag it with the mouse button pressed. The cursor only allows a modification of the horizontal position of the key point, whereas the cursors only allow a modification of the vertical position. Each key point must stay between the previous cursor and the following cursor.
- click the key point cursor or

you want to modify. The indicated **Position** is now the position of the key point. Type the new vertical position (Y) of the key point. Note that you cant move the horizontal key point position with this method.
- type the new horizontal position of the key point you want to modify in the box **Position X**, then indicate the new vertical position of the key point. Note that you cant move the horizontal key point position with this method.

To delete a key point :

Click one of the cursors or

of the key point you want to delete, or type its horizontal position in the box X, then press the button **Delete key point**

Vue d'Esprit offers two kinds of filters: linear filters and smooth filters.
Linear filters are generated with segments and smooth filters with splines.
To transform a linear filter into a smooth filter, check the **Smooth filter** box**.**

The behavior of a smooth filter is identical to the behavior of a linear filter except that you can change the slope of the curve around the key points.

To modify the slope around the key point, select a key point by clicking one of its cursors or

, or by typing its horizontal position in the box Position X. The box **Slopes** is now indicating the slope on the left and on the right of the key point. Type the new slope values.

To create a new filter, press **New**.

To save a filter, press **Save** and indicate the file name.

To load a filter, press **Load** and choose a filter name. Eventually add a comment.

This dialog box can stay opened all the time. Your modifications are taken into account immediately. To close the dialog box, click .

Selecting a filter :

All filters have the extension **.flt**.

To select a filter, you can type directly its name or select it in the file list. To change directory, use the directory list.

If you want a preview of the filter before loading it, check the box **Preview**. When you indicate a filter, Vue d'Esprit will specify the filter type (smooth or not) and will redraw it.

Click **Ok** or double click its name to load the filter.

Color gradation editor :

Description :

The color gradations are used to indicate variable colors.

Basically, they enable you to transform a number in the range 0 to 1 into a color, following a color gradation defined by the user. The color given by the gradation at a given position on the ruler is displayed in the color gradation.

The color gradations are built from key colors. The color gradation key colors indicate the color of the gradation at certain positions. Vue d'Esprit automatically generates a gradation to join the key colors. You can modify color gradations by adding, moving or deleting key colors.

The key colors are represented with cursors in the ruler under the color gradation.

All color gradations have a key color at the extreme right of the ruler (the corresponding cursor cant be moved).

To create a new key color, you can either :

- double-click in the area in which the color gradation is drawn ; a dialog box pops up so that you can specify the new color that will appear at the point you clicked. Indicate the color and click **Ok**. The color gradation is redrawn with the new color.

- click in the area in which the color gradation is drawn ; the position of the point you clicked appears in the box **Position**. To create the key color, press **Add key color** or double-click on the colored square in the middle; a dialog box pops up so that you can specify the new color that will appear at the point you clicked. Specify the color and click **Ok**. The color gradation is redrawn with the new color.

- type the new position of the key color in the box **Position** then press **Add key color** or double-click on the colored square in the middle ; a dialog box pops up so that you can specify the new color that will appear at the point you clicked. Specify the color and click **Ok**. The color gradation is redrawn with the new color..

You cant create two key colors with the same horizontal position.

To move a key color :

Click the cursor of the key color you want to move, and drag it with the mouse button pressed. Each key color has to stay between the one to its right and the one to its left.

To modify the color of a key color, you can either :

- double-click the key color cursor you want to modify ; a dialog box opens so that you can specify the color of the key color. Specify the color and click **Ok**. The color gradation is redrawn with the new color.

- click the key color cursor you want to modify. The indicated **Position** is now the position of that key color. Double click on the colored square in the middle; a dialog box opens so that you can specify the color of the key color. Specify the color and click **Ok**. The color gradation is redrawn with the new color.

To delete a key color :

Click the cursor of the key color you want to delete, or type its position in the box

Position, then press the button **Delete key color**.

To create a new color gradation, press **New**. The created color gradation is completely black.

To save a color gradation, press **Save** and indicate the file name. Eventually add a comment.

To load a color gradation, press **Load** and choose the color gradation name.

This dialog box can stay opened all the time. Your modifications are taken into account immediately. To close the dialog box, click  .

Selecting a color gradation :

All color gradations have the extension **.clr**.

To select a color gradation, you can type directly its name or select it in the file list. To change directory, use the directory list.

If you want a preview of the color gradation before loading it, check the box **Preview**. When you select a color gradation, Vue d'Esprit will display it in the display window

Click **Ok** or double click its name to load it definitively.

Selecting a color :

To select a color, you must indicate its color composition made of green, blue and red components. Each component has a value in the range of 0 - 255.

To indicate a component, you can type directly its value in the corresponding box or use the slider.

The resulting color is displayed in the display window.

Click **Ok** to accept the color.

Function editor :

Description :

The functions are used every time it is necessary to indicate a value depending on a position. For example, to indicate a variable transparency factor (depending on the position) of a material.

Basically, the functions enable you to associate to any point in space a value in the range 0 to 1.

The function is represented with a black and white picture indicating the function value on an objects surface (sphere, cube, cone...). If the function value is equal to 0 at a point, this point is black ; if the value is equal to 1, the point is white.

The dialog box can displays 5 images of the function. To visualize the function, press the button **Render**. A new picture of the function is rendered. When the 5 picture boxes are filled, the pictures are shifted to the left, and the last but one is lost. The extreme left picture is the one of the function when you opened the function editor, and it cant be replaced.

Anytime you render a picture of the function, Vue d'Esprit stores the definition at the corresponding function. You can revert to a previous version of the function anytime you want by double-clicking the corresponding picture (or by selecting the option **Restore this version** of the menu which appears when the mouse is above the picture and you press the right button).

At any time you want, you can cancel all the modifications you have made to the function by re-selecting the extreme left picture.

Choose the display options of the picture (represented object...) by pressing the button **Options**.

To visualize a bigger an more detailed picture of the function, press the button **Zoomed**.

The functions are built from a sum of layers. The value given by the function at a given point is the sum of the values given by each layer of the function at this point.

The list of layers making up the function is displayed in the central box. This list indicates for each layer, the number of the layer, its type, its amplitude, its scale and its origin. The lower part of the dialog box gives in detail the characteristics of the layer selected in the list (to select a layer in the list, click on it). The number of the detailed layer is written in the box **Details of the layer**.

The **number of layers** which make up the function is indicated at the left of the layer list.

To add a layer, click the button **Add**. The new layer, defaulting to type Null, is added at the bottom of the list.

To delete a layer, select the layer you want to delete by clicking it in the list, then press the button **Delete**.

Under the layer list, 3 curves are displayed. They represent the values of the function along the 3 axis X, Y et Z.

To expand the values of the function (to spread further away the values from the average value), indicate an **Extension** greater than 1. On the contrary, to contract the values, indicate an extension smaller than 1.

The layers :

The layers can be of 2 **kinds** : **procedural values** or **tiled picture.**

Select the kind of layer by checking the box corresponding to your choice.

The amplitude of the layer characterizes its relative influence (relative to other layers) of the detailed layer.

Indicate the scale of the layer along the X, Y (and Z for the procedural values layers) axis.

Indicate the coordinates of the origin of the layer.

If you want to add turbulence to the layer, check the box **Turbulence**. To modify the turbulence parameters, press the button **Edit**.

If you want to transform the layer, check the box **Transformation**. To modify the transformation parameters, press the button **Edit**.

1-Procedural value layers :

The procedural value layers are defined by their type, their amplitude, their scale, their origin, and eventually turbulence and transformation.

The **type** of the layer characterizes the way the values vary with the position. They can be any of the following :

Null (returned value : always 0.5)
Wood (uses turbulence)
Noise (smooth)
Tooth (rectangular)
Saw teeth
Water (calm)
Step (smooth)
Fractal
Granite
Marble (uses turbulence)
Wavelet
Sine wave
Spiral (expanding)
Wave
Agate (uses turbulence)
Noise (linear)
Offset (enables vertical shifting of values)
Tooth (triangular)
Water (troubled)
Step
Cracks
Tooth (gaussian)
Leopard
Onion
Rectangular
Spiral
Triangular

Layer types default to Null.

2-Tiled picture layers :

The tiled picture layers enable you to use any picture you want to generate the layer values. The layers value at a fixed point will be proportional to the picture brightness at this point.

You must first select the picture you want to use by clicking the button **Picture**.

To process the layer values in 3D from the picture (flat by definition), Vue d'Esprit will project the picture. Select the **type of projection** among the following types :

Flat	Vertical projection / slide projector type, oriented so as to project the picture on the ground ; values dont depend on the altitude
Faces	Projection of type slide projector oriented along one of the axis, the projection axis is for each point the closest axis to the normal vector of the object
Cylindrical	Mercator projection : the picture is rolled around a cylinder around

the vertical axis before being projected.

Spherical	The picture is projected so that it covers exactly a sphere.
Torical	The picture is projected so that it covers exactly a torus.

Note that the shape of the object on which you project the picture does not has to be the same as the type of projection you choose.

If you want the picture to **tile** symmetrically horizontally, check **Mirror X ;** If you want the picture to **tile** symmetrically vertically, check **Mirror Y.**

When the function is much zoomed, you can see pixels, due to the limited resolution of the picture. To reduce this effect, choose an **over sampling** method :

None	No over sampling
Bi-linear	Bi linear interpolation between pixels
Normalized	Proportional values to the distance to the pixels
Bi-cubic	Bi-cubic interpolation between pixels (continuous derivative)

Load / Save a function :

Create a new function by clicking the button **New** ; the created function has a layer of type Null.

To save a function, press the button **Save** and specify the name of the function.

To load a function, press the button **Load** and choose the name of the function.

This dialog box can stay opened all the time. Your modifications are taken into account immediately. To close the dialog box, click  .

Material editor :

Description :

A material characterizes the appearance of an object. It is represented by a picture of an object (sphere, cube, cone...) dressed up with the material.

The dialog box can display 5 pictures of the material. To visualize the material, press the button **Render**. A new picture of the material is rendered. When the 5 picture boxes are filled, the pictures are shifted to the left, and the last but one is lost. The extreme left picture is the one of the material when you opened the material editor, and it cant be replaced.

Anytime you render a picture of the material, Vue d'Esprit stores the definition at the corresponding material. You can revert to a previous version of the material anytime you want by double-clicking on the corresponding material (or by selecting the option **Restore this version** of the menu which appears when the mouse is above the picture and when you press the right button).

At any time you want, you can cancel all the modifications you have made to the material by re-selecting the extreme left picture.

Choose the display options of the picture (represented object...) by pressing the button **Options**.

To visualize a bigger and more detailed picture of the material, press the button **Zoomed**.

Vue d'Esprit deals with 2 kinds of materials : the materials themselves (**Simple**) and the **Mixed materials**. Check the corresponding box you want.

1- The materials :

A material is characterized by :

Color	color of the surface
Bumps	existence and shape of bumps on the surface (bump-mapping algorithm)
Specular	specular reflections : shiny or not aspect of the surface
Transparency	transparency of the material
Reflections	reflections on the materials surface
Lighting	local characteristics of the surface lighting

To modify the parameters of one of those characteristics, press the corresponding button.

If you want to add turbulence to the material , check the box **Turbulence**. To modify the turbulence parameters, press the button **Edit**.

If you want to transform the material, check the box **Transformation**. To modify the transformation parameters, press the button **Edit**.

If you want to cycle the material, check the box **Cycling**. To modify the cycling parameters, press the button **Edit**.

2- The mixed materials :

With 2 materials, you can build a third one (called mixed material). It will be constituted of the first material in some areas and the second one in the other areas.

Both materials are mixed according to a function and can be influenced by the terrain.

For example, if you mix a rock material and a snow material, you will get a snowy terrain.

To define the two materials to mix, press the button **Materials to mix.**

Indicate the visible **Proportion** for each material: the bigger the proportion, the more of the second material you will see in the mixed material.

If you want the **distribution of both materials to depend on slope and local altitude**, check the corresponding box. With this option, you will specify, for example, that a snowy material is more represented at high altitudes. To edit the parameters, click the button **Edit the parameters**.

Load / Save a material :

Create a new material by clicking the button **New** ; the created material is black and smooth.

To save a material, press the button **Save** and specify the name of the material.

To load a material, press the button **Load** and choose the name of the material.

This dialog box can stay opened all the time. Your modifications are taken into account immediately. To close the dialog box, click  .

Material colors :

This dialog box defines the color of the surface of the material.

You can choose among 2 types of surface coloration :

- colors coming from a **tiled picture**

- **procedural colors**.

Check the corresponding box you want.

1- Tiled picture :

You can use any picture you want to generate the colors of the surface of the material.

You must first select the picture to use by clicking **Picture**.

To process the material colors on a 3D volume from the picture (flat by definition), Vue d'Esprit will project the picture. Select the **type of projection** among the following types :

Flat	Vertical projection / slide projector type, oriented so as to project the picture on the ground ; values dont depend on the altitude
Faces	Projection of type slide projector oriented along one of the axis, the projection axis is for each point the closest axis to the normal vector of the object
Cylindrical	Mercator projection : the picture is rolled around a cylinder around the vertical axis before being projected.
Spherical	The picture is projected so that it covers exactly a sphere.
Torical	The picture is projected so that it covers exactly a torus.

Note that the shape of the object on which you project the picture does not have to be the same as the type of projection you choose.

If you want the picture to **tile** symmetrically horizontally, check **Mirror X ;** If you want the picture to **tile** symmetrically vertically, check **Mirror Y.**

When the material is much zoomed, you can see pixels, due to the limited resolution of the picture. To reduce this effect, choose an **over sampling** method :

None	No over sampling
Bi-linear	Bi linear interpolation between pixels
Normalized	Proportional values to the distance to the pixels
Bi-cubic	Bi-cubic interpolation between pixels (continuous derivative)

Indicate the scale of the picture along the X and Y axis.

2- Procedural colors :

Vue d'Esprit can generate the color of the material mathematically, using a function, a filter and a color gradation.

This is how it works : for each point of the surface, the function calculates a value in the range 0 to 1 (0 appears black on the picture of the function, 1 white). This value is then transformed by the filter into another value in the range 0 to 1. From this last value, the color gradation calculates the color of the surface (if this value is 0, the color will be the one at the left end of the gradation, if it is 1, the color will be the one at the extreme right).

Modify the function, either by loading another function from disk by clicking the button **Load** (or by selecting this option from the pop-up menu that appears when you press the right mouse button above the picture of the function), either by editing directly the function (double-click on the picture of the function).

Indicate the scale of the function along the X and Y axis.

Use, if necessary, the filter to modify the way the values of the function are transformed into colors (double-click on the filter).

Finally, indicate which colors are associated to the values of the function by editing the color gradation (double-click on the gradation). Note that if the color gradation is uniform (only one color), whatever be the function and filter, the material will always be a uniform color.

This dialog box can stay opened all the time. Your modifications are taken into account immediately. To close the dialog box, click  .

Bumps on the surface of a material :

This dialog box describes the bumps and holes that appear on the surface of the material.

Vue d'Esprit generates holes and bumps on the surface from the values of a function and a filter.

This is how it works : for each point on the surface, the function gives a value in the range 0 to 1 (0 appears black on the picture of the function, 1 white). This value is then transformed by the filter into another value in the range 0 to 1 that indicates the depth of the hole (or height of the bump) at this point (0 for a deep hole and 1 for a high bump).

The principle which is used to add bumps and holes on the material surface is called "Bump-mapping". It creates a local perturbation to the normal of the surface ; this gives a purely visual bump effect.

Modify the function, by loading another function which exists already with the button **Load** (or select this option in the menu you get when you click with the right mouse button on the picture of the function), or by editing directly the function (double-click on the picture of the function).

Indicate the scale of the function along the X, Y and Z axis.

If necessary, use the filter to modify the bump profile relatively to the values of the function (double-click the filter).

At the end, indicate a **Bumps gain** in the corresponding box.

This dialog box can stay opened all the time. Your modifications are taken into account immediately. To close the dialog box, click  .

Specular reflections on the surface of a material :

This dialog box describes the surface quality of the material (shiny or not). The specular reflections create on the object surface some light spots in the direction of the lighting sources. The smoother the surface is, the more concentrated and intense the spots are.

If you want the characteristics of the specular reflections to depend on the position , activate **Variable specular reflections**.

The specular reflections are built with two parameters : the intensity of the light spots that appear on the surface and the surface aspect.

The **Spot intensity** corresponds to the average intensity of the light spots. Indicate a brilliance percentage (0% = no spots, 100% = very intense spots).

The **Surface aspect** controls the average concentration (size) of the light spots. Indicate a concentration percentage (0% = big spots, 100% = small spots).

To give a metallic aspect to a material, check the box **Metallic surface**. The light spots created by the specular reflections will have the color of the surface.

Variable specular reflections :

Vue d'Esprit can generate variable specular reflections with a function and two filters, a first one to indicate the light spot intensity and a second one to indicate the concentration.

This is how it works :for each point of the surface, the function calculates a number in the range 0 to 1 (0 appears black on the picture and 1 white). The number is then transformed with the filters into an intensity and a light spot concentration at this given point (0 for few intense and spread out spots, 1 for intense and concentrated).

Modify the function, by loading another function which exists already with the button **Load** (or select this option in the menu you get when you click with the right mouse button on the picture of the function), or by editing directly the function (double-click on the picture of the function).

Indicate the scale of the function along the X, Y and Z axis.

Indicate a light spot intensity with the filter **Intensity**(double-click the filter).

Indicate a light spot concentration with the filter **Concentration**(double-click the filter).

This dialog box can stay opened all the time. Your modifications are taken into account immediately. To close the dialog box, click  .

Material transparency :

This dialog box specifies the transparency of the material .

If you want the transparency to be dependent on the position, check the **Activate variable transparency** box.

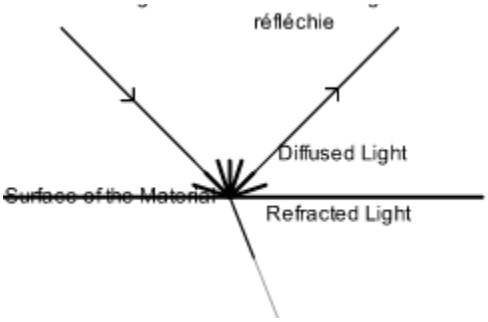
To make appear in transparency an other material behind the main material, check the box **Underlying material**. You must then specify the underlying material by loading a material that exists on the disk with the button **Load** (or select the option in the menu you get by clicking with the right mouse button on the picture of the material), or by editing directly the material (double click on the picture of the material).

If there is no underlying material the incident light divides itself into 3 different lights on the material surface :

- the light diffused by the surface in all directions ; it specifies the color of the surface,

- the light reflected that bounces of the surface of the material,

- the light refracted (or transmitted) ; it is the light that goes through the surface and crosses the material.



The quantity of diffused light is equal to the quantity of incident light less the quantity of refracted and reflected light.

Indicate the proportion of refracted light in the box **Transparency percentage**.

Change the **Refraction index** of the material with the corresponding box. The refraction index modifies the direction of the refracted light, thus making a magnifying glass magnify, and giving the impression that a stick in the water is broken. The refraction index of water is equal to 1.33, the one for the air is 1, and the one for the glass is 1.5.

When light travels inside a material, it progressively disappears with the distance. This phenomenon explains the fact that a glass window is transparent when you look trough it, but green when you look at its side. It is called fade out.

Indicate a **fade out depth**, that is the depth at which light has completely disappeared and the color becomes the fade out color. If the value is big, you will see deep in the material.

Specify the **fade out color** (or double click on it), that is the color of the material when light has traveled deep.

The objects placed behind a transparent material, receive light of a color depending on the traveled distance inside the transparent material. The light takes the color of the surface of the transparent material. That is why blue water

seems to be green when the sand gets closer to the surface.

Indicate the **Light color** (double click on it).

Variable transparency :

Vue d'Esprit can generate variable transparency with a function and a filter that indicates the amount of transparency depending on the value of the function.

That is the way it works : for each point of the surface, the function calculates a number in the range 0 to 1 (0 is black on the picture of the function and 1 is white). This number is then transformed by the filter into a transparency value.

Modify the function, either by loading an other function that already exists on the disk with the button **Load** (or by selecting this option in the menu you get when you click with the right mouse button on the picture of the function) or editing directly the function (double-click on the picture of the function).

Indicate the scale of the function along the X, Y and Z axis.

Indicate the values of the transparency with the filter (double-click on the filter).

This dialog box can stay opened all the time. Your modifications are taken into account immediately. To close the dialog box, click  .

Reflections on the surface of a material :

This dialog box specifies if the surface of the material is reflective.

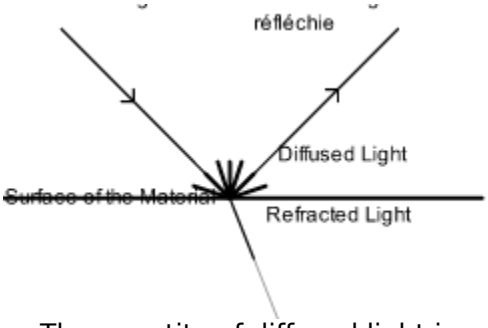
If you want the reflection to be dependent on the position, check the **Activate variable reflections** box.

The incident light divides itself into 3 different lights on the material surface :

- the light diffused by the surface in all directions ; it specifies the color of the surface,

- the light reflected that bounces of the surface of the material,

- the light refracted (or transmitted) ; it is the light that goes through the surface and crosses the material.



The quantity of diffused light is equal to the quantity of incident light less the quantity of refracted and reflected light.

Indicate the proportion of reflected light in the box **Percentage of reflection**.

Variable reflections :

Vue d'Esprit can generate variable reflections with a function and a filter that indicates the amount of reflections depending on the value of the function.

That is the way it works : for each point of the surface, the function calculates a number in the range 0 to 1 (0 is black on the picture of the function and 1 is white). This number is then transformed by the filter into a reflection value.

Modify the function, either by loading an other function that already exists on the disk with the button **Load** (or by selecting this option in the menu you get when you click with the right mouse button on the picture of the function) or editing directly the function (double-click on the picture of the function).

Indicate the scale of the function along the X, Y and Z axis.

Indicate the values of the reflection with the filter (double-click on the filter).

This dialog box can stay opened all the time. Your modifications are taken into account immediately. To close the dialog box, click ✔.

Lighting on the surface of a material

This dialog box specifies the characteristics of the lighting relative to the material.

The surface of the material receives light from the light sources (the sun) and from the environment. The first of these two lights is called diffused light and the second ambient light.

Vue d'Esprit enables you to create for each material different proportions of diffused and ambient light.

Indicate the quantity of **diffused** light which is received in the corresponding box.

Indicate the quantity of **ambient** light which is received in the corresponding box.

By default, the values are respectively 60% and 40%. Dont change too much these values ; you would get visual incoherence between different materials.

Note that the sum of the ambient light and the diffused light is equal to 100%. To create an over exposed material, you could have a sum greater than 100% (to be used cautiously).

To modify the general proportion of diffused and ambient light, use the menu item Meteorology -Characteristics of the light...

The **Softness** of the material characterizes the speed at which the material goes from light to shadow. To get soft transitions, indicate a soft softness and to have quick transitions, indicate a hard softness (!)

This dialog box can stay opened all the time. Your modifications are taken into account immediately. To close the dialog box, click  .

Turbulence :

This dialog box enables you to apply turbulence to a material (or to a function layer) by changing or moving it locally.

To move it, the turbulence adds a certain number of times, a noise to the position of the point where the material (or the function layer) is being evaluated.

The turbulence is defined by 4 parameters : the intensity, the scale, the complexity and the harmonics.

The intensity of the turbulence is the average displacement applied by the noise to the material or to the function layer.

The scale of the turbulence is the speed of the moving relative to position.

The complexity of the turbulence defines the number of time a noise is added to the position.

The harmonics characterize the way the 2 first parameters are behaving any time a noise is added : for each new addition, both parameters are multiplied by the harmonic parameter. If the complexity is equal to 1, the harmonic parameter has no meaning.

Suggestion : to understand correctly the turbulence effects, watch the variation of a function constituted with one Marble layer in which you will edit the turbulence.

The turbulence behavior is not identical for a material and for a function layer : for a function layer, the turbulence takes into account the scales of the layer whereas for a material, the scale of the material is not taken into account.

This dialog box can stay opened all the time. Your modifications are taken into account immediately. To close the dialog box, click  .

Transformation :

This dialog box enables you to rotate the material or function layers in space around the X, Y and Z axis.

Indicate the **rotation angles** around each axis. A rotation of 0 ° does not modify the material or function layer ; 90° transforms it into a right angle (a rotation of 90° around the X axis transforms the Y axis into a vertical axis and the Z axis into an horizontal axis); a rotation of 180° flips around the material or the function layer and a rotation of 360° does not change anything.

This dialog box can stay opened all the time. Your modifications are taken into account immediately. To close the dialog box, click  .

Cycling :

This dialog box handles how the material repeats over large areas.

The cycling modifies locally the scale of the material to make it appear sometimes smaller and sometimes larger.

Thus, to prevent a material from being too repetitive, activate the cycling.

The cycling is controlled by 2 parameters : the amount and the scale.

The amount of cycling defines how much the scale of the material will vary.

The scale of cycling defines the speed at which the scale of the material varies.

This dialog box can stay opened all the time. Your modifications are taken into account immediately. To close the dialog box, click  .

Influence of the slope and the altitude :

This dialog box specifies the influence of the slope and the altitude at a given point on the distribution of materials of a mixed material.

Indicate the **influence of the slope** on the distribution. Choose where you want to make appear the material 2 (on steep slopes or not ?).

Indicate the **influence of altitude** on the distribution. Choose where you want to make appear the material 2 (at low altitudes or not?).

To make a realistic distribution of snow on a landscape, you can indicate for example that snow appears mostly at high altitudes and that it tends to gather on smooth slopes.

To choose the materials 1 and 2, go to the box Materials to mix.

This dialog box can stay opened all the time. Your modifications are taken into account immediately. To close the dialog box, click  .

Choosing the materials to mix :

This dialog box enables you to choose the materials that will be mixed and the way they will be mixed.

Change the materials by loading materials that already exist on the disk with the button **Load** (or by selecting this option in the menu you get when you click with the right mouse button in the picture of the material to replace), or by editing directly the materials (double click in the picture of the material to edit).

To enlarge or reduce the materials displayed on a terrain, indicate a **Scale** bigger than 1 (resp. smaller than 1). A scale equal to 1 does not change the size of the materials.

Vue d'Esprit chooses which of both materials will appear in the mixed material by using a function 3D and a filter.

This is the way it works : for each point of the surface, the function calculates a value in the range 0 to 1 (0 appears black on the picture of the function and 1 white). This value is then transformed by the filter into an other value in the range 0 to 1, which is compared to the **Proportion** setting. If the setting is superior, then the material 1 is displayed. . If the value is inferior, then the material 2 is displayed.. At last, the result can be modified by the local slope and altitude.

Modify the function, either by loading another function that already exist on the disk with the button **Load** (or by selecting this option in the menu you get when you click with the right mouse button in the picture of the function), or by editing directly the function (double click in the picture of the function).

Indicate the scale of the function along the X, Y and Z axis.

If necessary, use the filter to define the material to display (double-click on the filter).

The areas where both materials mix can be softened by slowing down the **smooth transition speed**. In the areas where the two materials meet, the materials are blended together.

This dialog box can stay opened all the time. Your modifications are taken into account immediately. To close the dialog box, click  .

Loading a picture :

To select a picture, you can either type its name or select it in the file list. To change directory, use the directory list.

Vue dEsprit can cope with the following formats :

BMP (*.bmp)	16/256/16 millions of colors, uncompressed
Gif (*.gif)	256 colors compressed without any loss
Targa (*.tga)	16/256/65000/16 millions of colors compressed RLE or not
JPEG (*.jpg)	16 millions of colors, compressed with possible loss

If you only want to have a look at some files with a specific format, indicate this format in the **File type**. The file extension indicates the format.

To get a view of the picture before loading it, activate the **Preview**. When you indicate a picture, Vue d'Esprit will present it in the display window.

When you are satisfied with the file name, click **Ok** or double-click the name.

Saving a picture :

Indicate the name of the picture, or select a picture that already exists in the list (it will be overwritten). To change directory, use the directory list.

If you only want to have a look at the files with a specific format, indicate this format in the **File type**. The file extension indicates the format.

Vue d'Esprit can load the following picture formats :

BMP (*.bmp)	16/256/16 millions of colors, uncompressed
Gif (*.gif)	256 colors compressed without any loss
Targa (*.tga)	16/256/65000/16 millions of colors compressed RLE or not
JPEG (*.jpg)	16 millions of colors, compressed with possible loss

Specify the save format of the picture.

If you want to save under JPEG format, indicate the quality of the picture you save (the lower the quality, the higher the compression ratio and the losses; then the file which is saved is small). A quality of 100 % generates a picture compressed with the ratio about 2, without any information loss. If you tolerate little loss, you can reach compression ratios superior to 10, but dont go under a quality of 50 %, you would visually degrade the picture too much.

If you want to save under BMP format, GIF or Targa, you must specify the number of colors in the picture you save. If you select 256 colors, specify if you want Vue d'Esprit to dither colors to simulate gradations.

When you are satisfied with the file name, press **Ok** or double click on the name.

Exporting a terrain under dxf format :

Vue d'Esprit can export your terrain towards other applications by using a format which is used all over the 3D world : the dxf AutoCad format.

Unfortunately, this format generates very large files : a terrain can have millions of polygons (to know how many polygons your terrain has, refer to the status bar at the bottom of the dashboard).

So as to reduce the size of the generated files, you can ask Vue dEsprit to export the terrain with more or less precision : you can choose to **export all the polygons**, or **group them by 4 or 16**. To gather the polygons, Vue d'Esprit generates bigger polygons that comprise respectively 2x2 and 4x4 initial polygons ; the size of the file is reduced but the exported terrain is less precise.

The **size of the file that is generated** and the **number of polygons that are exported** is reminded at the bottom of the box.

Choose the precision you want and click **Ok** to start saving.

Zoomed view :

This dialog box enables you to visualize a zoomed picture of a material or a function. Adjust the picture size by enlarging the window, then start the calculation with **Render**.

Note that the calculation can be interrupted by pressing on the escape button.

This dialog box can stay opened all the time. Your modifications are taken into account immediately. To close the dialog box, click  .

Display options:

This dialog box enables you to choose which object will be drawn in the pictures that represent the materials or the functions.

Select the object among : **Cube**, **Marble**, **Sphere**, **Cylinder**, **Cone** or **Plane**.

You can choose a background for the picture (**Uniform** or **Checker**), and also the background color by modifying the color gradation (double-click the gradation).

This dialog box can stay opened all the time. Your modifications are taken into account immediately. To close the dialog box, click  .

To visualize the modifications, start the calculation of the function or the material by clicking the button **Render**.

Loading a material:

Indicate the name of the material you want to load, or select it in the file list. To change directory, use the directory list.

To get a preview of the material before loading it, check the box **Preview**.

When you have chosen the material to load, click **Ok,** or double-click its name in the list. Click **Cancel** to stop loading.

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Loading a function:

Indicate the name of the function you want to load, or select it in the file list. To change directory, use the directory list.

To get a preview of the function before loading it, check the box **Preview**

When you have chosen the function to load, click **Ok,** or double-click its name in the list. Click **Cancel** to stop loading.

Loading a color gradation:

Indicate the color gradation you want to load, or select it in the file list. To change directory, use the directory list.

To get a preview of the color gradation before loading it, check the box **Preview**

When you have chosen the color gradation, click **Ok,** or double-click its name in the list. Click **Cancel** to stop loading.

Loading a filter :

Indicate the name of the filter you want to load, or select it in the file list. To change directory, use the directory list.

To get a preview of the filter before loading it, check the box **Preview**.

When you have chosen the filter name, click **Ok,** or double-click its name in the list. Click **Cancel** to stop loading.

Saving an object of Vue d'Esprit :

Indicate the file name in which you want to save your object (filter, color gradation, function, material, terrain....), or select it in the file list. (it will be overwritten). To change directory, use the directory list.

You can add a **Comment** to your object, for example, a detailed description.

When you have chosen the file name, click **Ok,** or double-click its name in the list. Click **Cancel** to stop saving.

Characteristics of the sun:

This dialog box enables you to adjust the parameters related to the sun.

Vue d'Esprit considers the sun as a punctual source of light located at infinity. You must indicate the direction of the sun with the azimuth and the site boxes.

You must then specify the apparent size of the sun with its **radius**. Note that the apparent size is also related to the focale of the lens that will be used to render the picture.

Specify the color table which will be used to color the sun, from the outside to the inside. This option enables you to create a luminous halo effect around the sun for example. Modify the color table by double clicking on it.

This dialog box can stay opened all the time. Your modifications are taken into account immediately. To close the dialog box, click  .

Characteristics of the light :

Each point of the terrain receives light from the sun, the sky and the ambient environment. The sun light comes from the direction of the sun, the sky light from the vertical direction and the ambient light from all directions.

Vue d'Esprit enables you to specify the **global exposure** of the scene. Adjust the exposure by correcting the aperture (+1 diaphragm means you double the quantity of light in the scene, -1 means you divide it by 2).

You can also adjust the balance between the sun light and the ambient light.

Specify the origins of the ambient light : more or less from the sky or more or less omnidirectionnal.

Then, specify the color temperature for both types of light : usually, the sun light is warmer (more yellow) than the ambient light. You can create for example, a sunset light with a golden sun light... Double click on both colors to Choose the colors.

This dialog box can stay opened all the time. Your modifications are taken into account immediately. To close the dialog box, click  .

Water and waves :

This dialog box enables you to adjust the characteristics of the water.

You must specify the material that Vue d'Esprit will use to represent water.

The material used to represent water is displayed in the picture.

Change the material by loading a material that already exists with the button **Load** (or select this option in the menu you get when you click with the right mouse button on the picture of the material), or by editing directly the material by double clicking on the picture of the material.

To enlarge or reduce a material representing water, specify a **Scale** bigger than 1 (resp. smaller than 1). A scale equal to 1 does not change the size of the material.

The check box **Water until infinity** defines what occurs out of the terrain : if the box is checked, the water will spread until the horizon ; if not, you will directly see the sky outside the terrain.

This dialog box can stay opened all the time. Your modifications are taken into account immediately. To close the dialog box, click  .

Sky and clouds :

This dialog box enables you to adjust the characteristics of the sky and the clouds.

It is divided into 2 parts : one for the sky and one for the clouds.

The sky :

The sky is constituted of a vertical gradation deformed by the sun. Modify the color of the sky by changing the color table.

Indicate the altitude at which the gradation will start (near the horizon), and the height of the gradation. Out of the gradation, the colors which are displayed are the extreme colors. Indicate the **Altitude of the low parts** and the **height** of the gradation in the corresponding boxes.

The sun changes the colors of the sky by shifting the gradation to the high colors. Adjust the **Deformation of the gradation by the sun** in the corresponding box. For example, give a red color to a sunset by specifying an important deformation and by giving to the gradation the right colors.

Near the horizon, the sky is usually misty. The color of that veil is the one of the fog. Indicate the **Thickness of the fog in the sky**, and the **Height** in the sky.

The clouds :

You must specify the material that Vue d'Esprit will use to represent the clouds.

The material used to represent the clouds is displayed in the picture. This material will have to be transparent in places so as to let appear the sky behind the clouds.

Change the material by loading a material that already exists on the disk with the button **Load** (or select this option in the menu you get when you click with the right mouse button on the picture of the material), or by editing directly the material by double clicking on the picture of the material.

To enlarge or reduce a material representing the clouds, specify a **Scale** bigger than 1 (resp. smaller than 1). A scale equal to 1 does not change the size of the material.

Close to the horizon, the clouds tend to fade out, to dissolve in the general haze. Control this effect thanks to the parameter **Fade out at horizon** which handles the speed at which clouds disappear when they get close to the horizon.

Adjust the **Exposure of the clouds** with the corresponding box to darken or lighten the clouds.

In the sky, the clouds on the side of the sun are usually more illuminated than the clouds on the opposite side. You can change the illumination of the clouds with the parameters **Global illumination** and **Maximal**. The maximal illumination is reached close to the sun.

When the sun is behind the clouds, the clouds in front of the sun seem to burn up. Adjust this effect with the parameters of intensity and span of the burn up. Depending on the value you will give to the **Burn up intensity**, the effect will be more or less visible. The **Burn up span** corresponds to the size of the part of the clouds which are affected by the burn up.

This dialog box can stay opened all the time. Your modifications are taken into account immediately. To close the dialog box, click  .

Haze :

The haze gives a color to distant objects. Usually, that color is blue.

Unlike the fog, the effect of the haze saturates with the distance.

Specify a thickness and a color by clicking on the color.

This dialog box can stay opened all the time. Your modifications are taken into account immediately. To close the dialog box, click  .

Fog :

The objects progressively disappear in the fog.

The further the objects, their color merges into the color of the fog. Unlike haze, fog is more and more present with distance.

Indicate a **Uniform fog thickness.** It is the distance at which the objects totally disappear in a uniform fog, regardless of altitude.

The fog very often accumulates in the sky or in the lower parts. You can reproduce this effect by using fog depending on altitude.

Specify a **Relative thickness** of the accumulated fog depending on the altitude. This parameter controls the speed at which the fog dissipates with altitude. When you specify a relative thickness different from 0, the other options are activated.

If you want the fog to be accumulated in the lower parts, check the box **Fog accumulating in the lower parts**; if you prefer the fog to accumulate in the higher parts, check the other box.

Specify an **Altitude of accumulation**. It is the altitude at which the accumulated fog is totally impenetrable.

Visualize the thickness of the fog depending on the altitude with the curve **Thickness**. This gives you an idea of the distribution of the fog.

Click in the **color** to modify the color of the fog.

This dialog box can stay opened all the time. Your modifications are taken into account immediately. To close the dialog box, click  .

Layer of fog:

Description :

The fog is very often capricious. It does not spread in a uniform way. It accumulates to create layers.

Vue d'Esprit enables you to create horizontal fog layers. To add a fog layer to the terrain, click the button **Add**.

You must specify the material that Vue d'Esprit will use to represent the layer.

The material used to represent the layer is displayed in the picture.

Change the material by loading a material that already exists on the disk with the button **Load** (or select this option in the menu you get when you click with the right mouse button on the picture of the material), or by editing directly the material by double clicking on the picture of the material.

To enlarge or reduce a material representing water, specify a **Scale** bigger than 1 (resp. smaller than 1). A scale equal to 1 does not change the size of the material.

Specify the characteristics of the layer with the **Altitude** of the layer box (with the coordinates of the map).

Indicate the **Thickness** of the layer. The thinner the layer, the more transparent it is. This parameter defines the global transparency of the layer, regardless of the transparency of the material. A value equal to 0 means that the layer will be fully transparent, hence invisible .

When an object (rock, mountain...) crosses a fog layer, it dissipates the fog around itself. Adjust this **Attenuation by terrain** to increase or not this effect.

Some fog layers also seem to hang on an object. They are called **Confined layers**. You can confine layers around a point of your choice. If you want the layer to be confined, check the corresponding box. You must then indicate the **Radius** of the layer (its size with the coordinates of the map), and the coordinates X and Y of the **point around** which the layer is confined.

They are defined by the coordinates of the point they hang at, and by their span.

You can create as many fog layers as you want. However, you can only visualize the characteristics of one layer at a time. The number of the detailed layer is indicated in the box **Details of the layer**. To visualize the other layers, use the buttons **Previous** and **Next**.

To delete a layer, detail the layer to suppress on the screen by using the buttons previous and next and press the button **Delete**. The layer is then deleted.

This dialog box can stay opened all the time. Your modifications are taken into account immediately. To close the dialog box, click  .

Parameters of the camera... :

This dialog box gathers all the information concerning the camera.

Indicate the **Position of the camera** in map coordinates, along the 3 axis X, Y and Z, in the corresponding boxes. Specify whether the altitude of the camera is **Relative to ground or water** or if it is an **Absolute altitude**. If the altitude of the camera is relative to ground or water, its real altitude will depend on the point where the camera is placed.

Indicate the **Direction** the camera is pointing in. Specify the azimuth and the pitch in degrees in the corresponding boxes.

Specify the **focal distance** of the lens of the camera.

The camera is displayed on the map of the dashboard. This representation is automatically refreshed when you modify parameters. Note that the pitch of the camera is not visible on the map.

This dialog box can stay opened all the time. Your modifications are taken into account immediately. To close the dialog box, click  .

Previewing... :

This dialog box enables you to visualize quickly the scene and to move the camera, so as to choose the best point of view and framing.

The terrain is represented either by a wireframe or with hidden lines. In wireframe, only the edges of the facets are drawn ; in hidden lines, the facets are filled. Choose the hidden line representation by checking the option **Hidden lines**.

The representation of the terrain can be more or less detailed. Select from the drop down list the **Detail level** of the wireframe that represents the terrain.

Move the camera with the following buttons :

to move the camera to the left

 to move the camera to the right

 to move the camera upwards

 to move the camera downwards

 to move the camera forwards in the terrain

to move the camera backwards

 to turn the camera to the left

 to turn the camera to the right

 to turn the camera upwards

 to turn the camera downwards

You can modify the focal distance of the lens of the camera by using the buttons  and

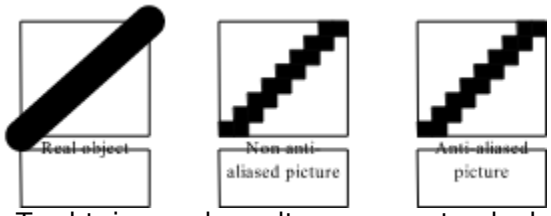
 to respectively increase and decrease the angular opening of the lens.

The camera is represented on the map of the dashboard. This representation is automatically refreshed when you modify parameters. Note that the site of the camera is not visible on the map.

This dialog box can stay opened all the time. Your modifications are taken into account immediately. To close the dialog box, click  .

Anti-aliasing... :

Anti-aliasing is a method to reduce the stair step effect (pixelization) due to resolution. The method consists in calculating several sub pixels for every pixel of the picture so as to improve transitions ; the result is the apparition of half tones in the transitions.



To obtain good results, you must calculate tens of sub pixels for each pixel, which increases a lot the calculation time. So as to optimize the method, the effort is concentrated on the transition pixels.

To do so, the render engine of Vue d'Esprit launches for each pixel, a first batch of rays and computes the standard divergence of the corresponding sub pixels. If this value exceeds a threshold, it launches a second batch, and so on, until the standard divergence is less than the threshold.

Specify the **Number of rays** for each batch and the **Threshold** for the divergence. Note that, at least, for each pixel, one batch will be launched. The calculation time will hence be at least multiplied by the number of rays in the batch.

To activate anti-aliasing, check the box **Activate anti-aliasing** in the dialog box Render the picture.

Click **Ok** to accept the values.

Summary of materials... :

This dialog box enables you to visualize with one glance the main materials used in your landscape.

The materials currently used in the terrain, the water and the clouds are represented by the corresponding pictures.

To change a material, load a material that exists on the disk with the button **Load** (or select this option in the menu you get when you click with the right mouse button in the picture of the corresponding material), or edit a material (double-click on the corresponding material).

To enlarge or reduce a material displayed on the terrain, the water or the clouds, indicate a **Scale** bigger than 1 (respectively smaller than 1). A scale equal to 1 does not change the size of the material.

This dialog box can stay opened all the time. Your modifications are taken into account immediately. To close the dialog box, click  .

Rendering the picture... :

Before rendering the picture, you must indicate rendering options.

Specify the **picture** resolution (in horizontal and vertical pixels). If the resolution is big, the picture will take time to render. Select one of the predefined sizes or specify an other resolution with the box **Other**.

Check the required rendering options :

- **Smooth the facets** : check this option to ask Vue dEsprit to create smooth surfaces to link the points of the terrain (bi cubic interpolation) rather than using flat facets. This option enables you to avoid angular edges. It slows down the speed of rendering a little.

- **Apply materials** : check this option to ask Vue d'Esprit to dress up the terrain with the materials. If you dont check this option, the terrain will appear to be white.

- **Use anti- aliasing** : check this option to ask Vue d'Esprit to use anti-aliasing to increase the quality of the picture. This option increases the appearing resolution of the picture by reducing the step effect. It slows down the speed of rendering . To adjust the parameters of the anti-aliasing, refer to the menu item Picture - Anti-aliasing.

- **Compute cast shadows** : check this option to ask Vue d'Esprit to render cast shadows. If you check this option, some areas of the terrain will cast shadows on other areas. It slows down the speed of rendering.

- **Render reflections / refractions** : check this option to ask Vue d'Esprit to deal with transparent or reflective surfaces. This option gives a better aspect to water. It slows down the speed of rendering.

Specify whether you want to see the **Picture while rendering**. Vue d'Esprit will open a window to show the picture rendering. You cannot change the size of this window.

Specify whether the picture should be **Saved on the disk**. Specify the name of the save file by clicking **File** and by selecting the file name.

You can ask Vue d'Esprit to **render only a part of the picture**. To do so, indicate the part you want to render (in pixels) in the corresponding boxes.

Start rendering by clicking **Ok**.

Vue d'Esprit can work in exclusive mode or in multitasking mode : the exclusive mode will take all the resources (the computer is blocked), and the multitasking mode shares resources but slows down rendering (you can work on your computer while a picture is rendering).

During the rendering, the working mode is displayed in the box **Render of the picture**. You can, any time you want, switch from exclusive mode to multitasking mode by pressing the button escape. On the contrary, you can switch from multitasking mode to exclusive mode by using the button **Exclusive** which appears in multitasking mode.

The percentage of the picture already rendered is displayed during the rendering.

To stop rendering, switch to multitasking mode with the button escape and click **Cancel,** or press twice on the button escape.

When the picture is completely rendered, the button **Cancel** becomes **Ok**, and the window of the progress of the rendering disappears.

If you close the window that displays the picture, you can call it back by selecting the menu item **Picture - Display the last picture**.

Re- rendering :

This menu item restarts the rendering of a picture, using the same options as the previous rendering.

To modify the render options, you must select the item **Render picture** of the menu Picture.

Display last picture :

This menu item displays the last picture rendered by Vue dEsprit. The size of the window of the picture cannot be modified. The picture is magnified or reduced to fill exactly this window. The only way to visualize a bigger picture is to save it during render and use a bitmap viewer such as the one supplied with windows.

New :

Select this option to create a new landscape. All the parameters of the landscape are reset, the terrain is destroyed and disappears from the map.

If you had already created or modified a landscape, Vue dEsprit will suggest you to save it to disk.

Open... :

All the landscape files have the extension ".psg".

Indicate the file name and press **Ok** to load a landscape that already exists on the disk.

This enables you to restore from disk a landscape previously saved.

The terrain of this landscape displays in the map of the dashboard.

Save :

All the landscape files have the extension ".psg".

Vue d'Esprit saves your landscape under the same name, except if you have never saved it before. In that case, Vue dEsprit will ask you to indicate the file name (by default, it is "noname.psg"). Then, press **Ok** to save the landscape on the disk. You can eventually add a **comment** concerning the landscape..

Save as... :

All the landscape files have the extension ".psg".

This option enables you to save a landscape on the disk, and to specify the name under which you would like it to be saved. When you have indicated the file name, press **Ok** to save the landscape on the disk. You can eventually add a **comment** concerning the landscape.

Preferences :

This dialog box enables you to configure Vue d'Esprit. It indicates the color gradations that are used to display the map of the dashboard. The first one is used to display the areas of the terrain which are above the water, depending on altitude, the second one is used for the areas which are under water, depending on depth.

To modify the color gradations, double-click on them.

You can also specify the quality of the displayed map. This refers to the precision of the map that displays the terrain in the dashboard. This option does not affect the real definition of the terrain. It is only used for the map representation.

You can choose between 3 qualities **draft**, **normal** or **superior**.

Drawing the map with a **superior** quality can take a long time. Decreasing the quality will accelerate the process. The quickest display is obtained with the **Draft** quality.

Adjust the **Default display options** of the materials and the functions by clicking the respective buttons, and specify the options. By default, these options are used any time you create a new function or material. On the other hand, when you load a material or a function, the display options are the ones saved, and correspond to the picture. If you want the default options not to be replaced by the options that were saved, check the box **Overload saved options**. This enables you to accelerate the rendering of material or functions by selecting by default a smaller object. (Marble for example).

Validate the option **Save environment upon exit** if you want Vue d'Esprit to restore the same environment next time you use the software.

Click **Ok** to accept the changes. The map is re-drawn if necessary.

Exit Vue d'Esprit :

You can quit Vue d'Esprit by selecting the option **Landscape-Exit** of the menu, or by double-clicking on the system box, or by typing Alt+F4.

If you have created or modified a landscape, Vue d'Esprit will suggest you to Save it to disk before closing the application.

Tutorial :

Welcome to Vue dEsprit.

This tutorial will take you, step by step, thru the main aspects of creating virtual landscape pictures with Vue d'Esprit. It starts with a basic picture and then shows how to improve it gradually. Each step is illustrated by its corresponding picture, which you will find in the Vue d'Esprit directory, under the name *tutor_XX.bmp*, where XX refers to the number of the step. All these pictures were rendered with all options active. You will not be able to render reflections, transparency and shadows with the demo version.

Step 1 : Creating a terrain

1. Open Vue dEsprit (if not already done)
2. Select the menu item **Landscape - New**
3. Answer **Yes** to the suggestion to create a new terrain.
4. Indicate a terrain size equal to 3 blocks along X and Y, then click **Ok**. This creates a totally flat terrain with an altitude of 0. Vue dEsprit creates a terrain comprising 3x128 by 3x128 altitudes, all equal to 0.
5. Answer **Yes** to the suggestion to generate a fractal terrain. Vue dEsprit opens a dialog box asking you to indicate the parameters of the fractal terrain.
6. Accept those parameters without changing any of them by clicking **Ok.** Wait for a while as Vue dEsprit generates a terrain from a fractal calculation. The terrain will appear in the map of the Dashboard.
7. Now the terrain is defined, you can generate a first picture. Select the menu item **Picture - Render**.
8. Choose a resolution of 128x96. Check **View while rendering** , uncheck all the render options except **Render materials** and **Render reflection / refraction**. (Note : you can't activate this option if you only have the demo version). Click **Ok**.
9. Watch the picture as it renders.
10. Click to close the window displaying the picture. (this is optional : you can keep on working with the picture displayed).

Step 2 : Improving the terrain

1. Increase the proportion of emerging land : to do so, select the menu item **Terrain - Altitude of water.**
2. Indicate a water altitude equal to -33 and then click **Ok**. The map of the Dashboard is drawn again, with very little water.
3. We are now going to create a terrain looking like a canyon, that is a terrain presenting steps due to rock layers of different hardness. Select the menu item **Terrain - Generate a fractal terrain.**
4. Replace the **Altitude distribution** filter by the filter called *canyon.flt* given in example (to load a filter, select the menu item **Load filter** which appears when you press the right mouse button above the filter, or double click on the filter and click **Load**). That is the filter which creates the steps of the terrain.
5. Click **Ok.** Wait while Vue d'Esprit generates the terrain. The terrain will appear in the map of theDashboard.
6. Reduce the altitude of the mountain by selecting the menu item **Terrain - Amplitude of movements**.

7. Indicate an amplitude of 1.5 and check the box **Modify water altitude consequently** so that the surface covered by water stays the same. The altitude of water is now -24.75. Click **Ok.** The map is refreshed.
8. Add to the canyon the effects of rainwater streaming : select the menu item **Terrain - Create water streaming** . Vue d'Esprit creates the beds of numerous streams, then displays a dialog box.
9. Indicate a **Stream depth** of 1.0 and a **Hard** rock type, then click **Ok.** Vue d'Esprit digs the streams in the terrain and displays the map.
10. Re-render the picture by selecting the menu item **Picture - Render again**.

Step 3 : Framing

1. Improve the framing of the previous picture : to do so, select the menu item **Picture - Preview.**
2. The dialog box which opens displays a wire frame view of your landscape.
3. Adjust the framing by moving the camera with the buttons. The representation of the camera in the dashboard is refreshed. You can also adjust the framing by moving directly the camera on the map.
4. For a more precise adjustment of the characteristics of the camera, select the menu item **Picture - Parameters of the camera**.
5. Indicate the following values in the resulting box :
   Latitude = 177, Longitude = 377, Altitude = 12, Focal length = 56mm, Azimuth = 170°, Pitch = -7°, Altitude relative to water and ground.
6. Click ✔ to close the dialog box (optional).
7. Re-render the picture.

Step 4 : Dressing up the terrain

1. During the previous steps, Vue d'Esprit has been using materials by default, in particular, the material used for the terrain was sand. Change the terrain material by selecting the menu item **Terrain - Terrain material**.
2. Click the button **Load** in the displayed box and load the material *neigeux.mat* given as **example.**
3. The menu item **Picture - Summary of materials** displays a panel indicating the materials which are used for the terrain, the water and the clouds. You can change the corresponding materials in the same way.
4. Click ✔ to close the dialog box (optional).
5. Re-render the picture.

Step 5: Lighting

1. We are now going to give a warm evening light to our landscape : to do so, select the menu item **Meteorology - Characteristics of the sun** .
2. Position the sun close to the skyline, approximately in the camera direction : indicate the following values : **Azimuth** = 243°, **Pitch** = 12°.
3. Click ✔ to close the dialog box (optional).
4. Warm up the light color : to do so, select the menu item **Meteorology - Characteristics of the light**.
5. Don't change anything in the lighting balance ; double click on the color of the **Sun light** and choose a warm color in the displayed box (Red = 255, Green = 180, Blue = 65).
6. Double click on the color of the **Ambient light** and choose a cold color in the displayed box (Red

= 190, Green = 215, Blue = 255).

7. Click ✔ to close the dialog box (optional).
8. Re-render the picture.

Step 6 : Sky and clouds

1. We are now going to create a sky in compliance with the evening atmosphere of the previous steps :to do so, select the menu item **Meteorology - Sky and clouds**.
2. Change the sky color gradation : load the color table *couchant.clr* given in example (to do so, double click on the gradation then press the button **Load**, or click on the right mouse button above the gradation and select the item **Load a color table**).
3. To darken the clouds, place the slider **Cloud exposure** at 1/3 of its range, on the dark side.
4. Light up the clouds from behind by choosing a maximum **Intensity** and **Burn up span** (right of the slider).
5. Click ✔ to close the dialog box (optional).
6. Re-render the picture.

Step 7 : Humidity

1. To add a final touch to the atmosphere, add air humidity (fog) : select the menu item **Meteorology - Fog**.
2. Place the **Uniform fog** slider at 1/4 of its range so as to generate a slight uniform fog.
3. Create accumulated fog in the lower parts of the terrain : indicate an altitude dependent fog with a **Thickness** of 0.4.
4. Specify that the fog is accumulated in the lower part by checking **At the bottom**.
5. Indicate a **Gathering altitude** equal to 0.
6. Finally, modify the fog color by double clicking on the **color** and by indicating a rather dark color in compliance with the ambient light (Red = 141, Green = 131, Blue = 115).
7. Click ✔ to close the dialog box (optional).
8. The fog you have defined is homogenous. To create varying thickness areas, select the menu item **Meteorology - Layers of fog**.
9. Create a layer by clicking the button **Add**. Vue d'Esprit creates a totally black material to define the layer.
10. Click on the button **Load** and load instead the material *nappe.mat* given as example.
11. Indicate a **Scale** equal to 2 to enlarge the material.
12. Indicate a layer **Altitude** equal to -20, which means close to the water surface.
13. Specify a **Thickness** of 0.5 so that the layer is not too visible.
14. Place the slider **Attenuation by terrain** at 1/3 of its range so that the layer is slightly dissolved close to the terrain.
15. Click ✔ to close the dialog box (optional).
16. Re-render the picture.

You now control the broad line of Vue d'Esprit. To discover some other possibilities, refer to the items "How to?".

Don't forget that Vue d'Esprit exists under two versions, and that the commercial version generates even nicer pictures compared to the demo version. To find out how to obtain the commercial version, refer to

the item "Vue d'Esprit versions".

You can modify the terrain by hand by copying / pasting the terrain towards a graphic application.
Consult the item "How to modify by hand a terrain ?".

Have a nice virtual trip !

How to :

How to render a picture :

1. Select the menu item **Landscape - New**. Answer to the possible suggestion to save the previous landscape. **2.** Answer **Yes** to the suggestion to create a new terrain.
3. Indicate the terrain size you wish (3x3 is Ok), then click **Ok**.
4. Answer **Yes** to the suggestion to generate a fractal terrain.
5. Accept the calculation parameters of the fractal terrain by clicking **Ok**. Wait for a while... The terrain appears in the map of the Dashboard.
6. Select the menu item **Picture - Render**.
7. Choose a resolution of 256x192, check **View while rendering**, uncheck all the other options except **Render materials** and **Render reflection / refraction**. Click **Ok**.
8. Watch the picture as it renders.
9. Click  to close the dialog box displaying the picture.

How to increase the resolution of a picture :

1. Select the menu item **Picture- Render**.
2. Indicate the picture resolution you wish by using predefined resolutions (click the one you wish) or by indicating any other resolution (click **Other**). Notice : with the demo version, the size of the picture is limited to 320x240.
3. Click **Ok**.
4. Watch the picture as it renders. If the indicated resolution is bigger than the displayed window resolution, you will only see the quality improvement on the saved picture.

How to create a checker function (or other) :

1. Double click on the picture of the function (or select the option **Edit** from the menu that appears when you press the right mouse button above the picture) to start the function editor.
2. If the list of layers indicates other layers than the empty layer, delete all the layers (by using **Delete**) or press **New**.
3. Select a layer of style **Procedural values**.
4. In the drop down list **Type**, select a layer of type **Rectangular**. The views of the function along the 3 axes are refreshed. (To choose an other type, select it in the list).
5. Visualize the function by pressing the button **Render**.
6. Change the size of the checker tiles by modifying the **Scales** along each axis.
7. To add a second layer, for example cracks, press the button **Add**, then indicate the type **Cracks**.

How to accelerate the display of material or functions :

1. Select the menu item **Landscape - Preferences**.
2. Click the button **Display options** (**Functions** or **Materials**).
3. To increase render speed, select the object **Marble** (it is the fastest of the suggested objects) ; to increase render speed even more, select a **Uniform background**. (but it won't increase that much)
4. You can modify the **Background colors** without influencing render speed.

How to create a rock material :

1. Open the material editor by double clicking in the picture of the material you want to modify (or select the option **Edit** of the menu which appears when you press the right mouse button above the picture).

2. Check the box **Simple Material**.

3. Press the button **Color**.

4. Select a coloring type with **Procedural colors**.

5. Instead of the color gradation, load the gradation named *rocher.clr* given in example (to load a color gradation, select the menu option **Load** which appears when you press the right mouse button above the color gradation).

6. Open the function editor by double clicking in the picture of the function (or select the option **Edit** of the menu which appears when you press the right mouse button above the picture).

7. Indicate a layer of style **Procedural values**.

8. Select the type of layer **Noise** (**smooth**) in the drop down list **Type**.

9. Click  to close the function editor.

10. Render the material by clicking the button **Render**. The material surface is smooth ; we are going to add **bumps**.

11. Press the button **Bumps** .

12. Open the function editor by double clicking in the picture of the function (or select the option **Edit** of the menu which appears when you press the right mouse button above the picture).

13. Indicate a layer of style **Procedural values**.

14. Select the type of layer **Fractal** in the drop down list **Type**.

15. Click  to close the function editor.

16. Instead of the filter, load the filter named *fissures.flt* given in example (to load a filter, select the menu option **Load** which appears when you press the right mouse button above the filter).

17. Click  to close the bumps dialog box.

18. Render the material by clicking the button **Render**. The material surface is now cracked.

19. Note : the material *rocher1.mat* given in example corresponds to the aforementioned definition.

How to color a material with a picture :

1. Open the material editor by double clicking in the picture of the material you want to modify (or select the option **Edit** of the menu which appears when you press the right mouse button above the picture).
2. The material should be of type **Simple Material**.
3. Press the button **Colors**.
4. Select a coloring type with **Tiled picture**.
5. Press the button **Picture**, indicate the name of the picture file, then click **Ok**.
6. Select a type of projection **Flat**, and **None** for over sampling.
7. Click  to close the color dialog box..
8. Press the button **Render** to visualize the material.

How to use a picture to create bumps on the surface of a material :

1. Open the material editor by double clicking in the picture of the material you want to modify (or select the option **Edit** of the menu which appears when you press the right mouse button above the picture).
2. The material should be of type **Simple Material**.
3. Press the button **Bumps**.
4. Double click in the picture of the function (or select the option **Edit** of the menu which appears when you press the right mouse button above the picture) to open the function editor.
5. If the list of layers indicates other layers than the null layer, delete all the layers (by using **Delete**) or press **New**.
6. Select a layer of style **Tiled picture values**.
7. Press the button **Picture**, indicate the name of the picture file, then click **Ok**.
8. Select a type of projection **Flat**, and a **Bilinear** over sampling.
9. Click  to close the function editor.
10. Press the button **Render** to visualize the material.

How to create tropical water (blue in depth and green on the surface) :

1. Select the menu item **Meteorology - Water and waves**.

2. Open the material editor by double clicking in the picture of the material Water (or select the menu option **Edit** which appears when you press the right mouse button above the picture)

3. The material should be of type **Simple Material**.

4. Press the button **Colors**.

5. Indicate a coloration mode **Procedural colors**.

6. Double-click in the color gradation and indicate a blue color (surface color).

7. Click  to close the dialog box.

8. Press the button **Reflections**.

9. Be sure that the option **Variable reflections** is unchecked, then indicate a **Reflection percentage** of ~30%.

10. Click  to close the dialog box.

11. Press the button **Transparency**.

12. Be sure that the option **Variable Transparency** and **Underlying material** are unchecked, then indicate a **Transparency percentage** of ~60%.

13. Indicate a blue **Fade out color** (color in the deep), and a green **Light color** (color near the surface).

14. Indicate a **Refraction index** (IOR) of ~1.33.

15. Adjust the **Fade out depth** so as to obtain a rather deep fading out. Click  to close the dialog box.

16. Press the button **Render** to visualize the material. The calculation is rather long because Vue d'Esprit has to generate reflections / refraction.

17. The water you have created has a flat surface. To add waves, press the button **Bumps**, create a function with a procedural layer of type **Noise** (**smooth**), close the function editor and the dialog box then press **Render** to re-visualize the material.

How to create a landscape with fog at the bottom :

1. Select the menu item **Meteorology - Fog**.
2. Place the slider uniform **Fog thickness** on the left so as to indicate that the uniform fog is not very thick.
3. Move the slider **Altitude dependent fog thickness** to the right.
4. Check the box **Fog gathers at the bottom**.
5. Indicate a **Gathering altitude** smaller than the camera absolute altitude (for example, in between the water altitude and the camera absolute altitude).
6. Monitor in real time the evolution of the fog thickness on the **Thickness** curve.
7. Click  to close the dialog box .
8. Re-render the picture to visualize the fog.

How to create a blue haze in the distance :

1. Select the menu item **Meteorology - Haze**.

2. Place the slider **Haze thickness** in the middle.

3. Choose a blue haze color by double clicking on the color. Click Ok.

4. Click  to close the dialog box.

5. To make the haze turn gray at the horizon, add to the haze a thin gray fog (it could be accumulated towards the bottom). With distance, the fog eventually gets thicker than the haze, and the bluish color given by the haze gradually turns to the gray color of the fog.

How to create a canyon terrain :

1. Create a new terrain by selecting the menu item **Terrain - New terrain**.
2. Answer **Yes** to the suggestion to Generate a fractal terrain.
3. Replace the **Altitude distribution** filter by the filter named *canyon.flt* given in example. (To load a filter, select the menu item **Load** which appears when you click on the right mouse button above the filter).
4. Press on the button **Ok**. Vue d'Esprit renders the new terrain. Adjust the water altitude.

You can also refer to the item How to modify graphically a terrain... for an example of another (graphical) way to create canyon terrain.

How to create a landscape with snow-covered summits :

1. Select the menu item **Terrain - Terrain material**.
2. Open the material editor by double clicking in the picture of the material (or select the menu option **Edit** which appears when you press the right mouse button above the picture)
3. Select the box **Mixed materials**.
4. Click the button **Materials to mix**
5. In the displayed box, the material 1 is the previous material of your terrain. If you want to change this material, click the button **Load** under the material 1, and load the material you want (*rocher1.mat* for example).
6. Click the button **Load** under the material 2, in the displayed box, and load the material *neige.mat* given in example.
7. Indicate a **Smooth transition speed** equal to 0.2.
8. Click ✔ to close the dialog box.
9. Check the box **Distribution of materials dependent on local and altitude.**
10. Click the button **Edit** the parameters.
11. Indicate that the material 2 (the snow) is rather gathering on the **Flat surfaces**.
12. Indicate a **Slope influence** equal to 0.5 (average influence).
13. Indicate that the material 2 (the snow) is rather gathering at **High altitudes**.
14. Indicate an **Altitude** i**nfluence** equal to 0.5 (average influence).
15. Click ✔ to close the dialog box.
16. Indicate a **Threshold** equal to 0.5 (about half rock, half snow).
17. Press the button **Render** to visualize the material.
18. You can improve the material by adding a noise to the mixing process ; in the **Material distribution function**, load the function *bruitclm.fnc* given in example
19. Note : the material *neigeux.mat* given in example corresponds to the aforementioned definition.
20. Click ✔ to close the dialog box.

How to increase the quantity of snow in the previous landscape :

1. Select the menu item **Terrain - Terrain material**.
2. Load the material editor by double clicking on the picture of the terrain material (or select the menu option **Edit** which appears above the picture when you press the right mouse button).
3. Increase the value of the **Threshold** (move the slider towards the second material, which is in this case the snow) to increase the snow amount in the landscape. Reduce the threshold value to reduce the snow amount.
4. Press the button **Render** to watch the material.
5. Click  to close the dialog box.

How to give a sunset atmosphere :

1. Select the menu item **Meteorology - Characteristics of the sun**.

2. Indicate a sun **Pitch** equal to 8° (sun close to the skyline).

3. Click ✔ to close the dialog box.

4. Select the menu item **Meteorology - Characteristics of the light**.

.**5.** Double-click on sun **Light color** and indicate an orange color.

6. Click ✔ to close the dialog box.

7. Select the menu item **Meteorology - Sky and clouds**.

8. Instead of the color gradation indicating the color of the sky, load the color gradation *couchant.clr* given in example (to do so, double click on the gradation then press the button **Load**, or click on the right mouse button above the gradation and select the item **Load a color gradation**).

9. Darken the clouds by placing the slider **Cloud exposure** on the left side.

10. Indicate an important illumination for the clouds close to the sun by moving the slider **Sun side illumination** to the right.

11. Indicate an important burn up for the clouds closed to the sun by moving the slider **Burn up intensity** to the right.

12. Click ✔ to close the dialog box.

13. Re-render the picture to visualize the landscape with a sunset. The landscape *couchant.psg* gives in example a sunset atmosphere; it does not include any terrain which means that you will have to create one.

How to suppress the color steps in a zoomed material :

Color steps appear when a material colored with a picture is much zoomed and that no over sampling has been specified. The pixels of the tiled picture are creating this effect.

1. Open the material editor by double clicking on the picture of the material to modify (or select the option **Edit** of the menu that appear when you press the right mouse button on the picture).
2. The material must be of type **Material**.
3. Press the button **Colors**.
4. The type of coloration must be **Tiled picture**.
5. Select a type of over sampling **Bilinear**, **Bicubic** or **Normalized**.
6. Click  to close the color dialog box.
7. Press the button **Render** to visualize the material.

How to create a terrain with many mountains :

1. Select the menu item **Terrain - New terrain**.
2. Indicate the terrain size you wish (3x3 is Ok), then click **Ok**.
3. Answer **yes** to the suggestion to create a new fractal terrain.
4. Indicate an **Perturbation amplitude depending on the iteration degree** equal to O for the spaces 1 to 4. Click **Ok**. Wait for a while. The terrain will appear in the map of the Dashboard. Adjust eventually the water altitude.

How to create a mixed material with tilted stratums :

1. Open the material editor by double clicking on the picture of the material to modify (or select the option **Edit** of the menu that appears when you press the right mouse button on the picture).
2. Select a type of material **Mixed materials**.
3. Press the button **Material to mix**.
4. Click the button **Load** under material 1, and load the material *rocher1.mat* given in example.
5. Click the button **Load** under material 2, and load the material *rocher2.mat* given in example.
6. Indicate a **Smooth transition speed** equal to 0.05.
7. Open the function editor by double clicking on the picture of the distribution function (or select the option **Edit** of the menu that appear when you press the right mouse button on the picture).
8. Indicate a layer of type **Procedural values**.
9. Select the type of layer **Noise (smooth)** in the pop up list **Type**.
10. Indicate a **Scale** along **X** and **Y** equal to 5, and a scale along **Z** equal to 1.
11. Check the box **Transformation**.
12. Press the button **Edit** transformation.
13. Indicate a rotation around the **X** axis equal to 30°. (It tilts the stratums).
14. Click  to close the function editor.
15. Click  to close the dialog box of the material to mix.
16. Press the button **Render** to visualize the material.
17. Notice : the function *strates.fnc* given in example corresponds to the definition above

How to create undulated furrows on the surface of a material :

1. Open the material editor by double clicking on the picture of the material to modify (or select the option **Edit** of the menu that appears when you press the right mouse button on the picture).
2. The material must be of type **Simple Material**.
3. Press the button **Bumps**.
4. Open the function editor by double clicking on the picture of the bump function (or select the option **Edit** of the menu that appears when you press the right mouse button on the picture).
5. Indicate a layer of type **Procedural values**.
6. Select the type of layer **Wave** In the pop up list **Type**.
7. Indicate a **Scale** along **X** and **Z** equal to 20, and a scale along **Y** equal to 0.7. (Creation of furrows along Y. To position furrows differently, use the **Transformations**).
8. Indicate a **Bump gain** equal to 0.5.
9. Click  to close the function editor.
10. Check the box **Turbulence** in the material editor.
11. Press the button **Edit** turbulence.
12. Indicate an **Intensity** equal to 0.6, a **Scale** equal to 1.8, a **Complexity** equal to 2 and **Harmonics** equal to 0.3.
13. Press the button **Render** to visualize the material.
14. Notice : the material *sillons.mat* given in example corresponds to the definition above.

How to modify a terrain by hand :

The landscape *canyon.psg* given with Vue d'Esprit gives an example of a terrain modified by hand.

1. Create a terrain by selecting the menu item **Terrain- Create new terrain** and by indicating the size of the terrain.
2. If you wish, generate a fractal terrain.
3. When the terrain is rendered, select the menu item **Terrain- Copy terrain**. The terrain is now in the clip board and is a gray level picture.
4. In the graphic application, create a picture with the same size as the terrain (i.e. 128 times the number of blocks : for a terrain with 2 blocks along X and 3 along Y, create a picture with 256 pixels x 384 pixels).
5. Paste the picture of the clip board and modify it as you like. Remember that when you lighten a point of the picture it means that you increase the altitude of the corresponding point of the terrain.
6. Take back the picture by copying it to the clip board.
7. Paste the picture in your terrain by selecting the menu item **Terrain - Paste into terrain**.

The terrain of the landscape *canyon.psg* has been created in the following way : a meandering black river was drawn on a white background ; then, a gradation was made around the river ; the picture was then filtered to create steps and imported in Vue dEsprit ; at last, the terrain has been slightly eroded to smooth the steps and dug with many streams with the menu item **Terrain-Create water streaming**.

How to improve the aspect of a material seen from close :

When a material is seen from close, it sometimes lacks details. You can add details by complexifying the functions that define the material. Follow the operations for each function of the material (Advice : work in priority on the Bumps function)

1. Open the function editor by double clicking on the picture of the function to modify (or select the option **Edit** of the menu that appears when you press the right mouse button on the picture).
2. Each layer of the function has to be more complex : to do so, duplicate the first function layer by adding a new layer of the same **Type**.
3. Indicate a **Scale** along **X**, **Y** and **Z** equal to half of the scale of the duplicated layer.
4. Indicate an **Amplitude** equal to half of the scale of the duplicated layer.
5. Restart these operations for all the layers of the function.
6. Eventually increase the **Dilatation** so that the function covers all values in the range 0 to 1.
7. Click  to close the function.
8. Note that the function takes longer to be drawn since it is more complex.

Terrain block :

A terrain block is an array of 128x128 points that define the altitude of the terrain for each point. A terrain is constituted of the juxtaposition of a certain number of blocks. The first block of the terrain is the one located at the bottom left.

Terrain :

A terrain is a set of blocks constituting an array of points that define the altitude for each point. Those points are then mathematically joined in the space so as to get a continuous surface.

Visualize the terrain thanks to the map of the dashboard.

Facet :

A facet is a triangle which is smoothed in space. The terrain is constituted of an assembly of many facets joining the points of the terrain all together.

Vue d'Esprit can also join the points of the terrain with curved surfaces (bicubic interpolation).

Germ :

The germ is a number that defines in a unique way the succession of pseudo-random values that lead to a terrain. A given germ will always give the same terrain. However, the value of the germ is not so important since the relationship between germ and terrain is not foreseeable.

X axis :

It is the horizontal axis on the screen. For the map, it is the axis that goes form West to East. The origin of the axis is on the left side of the terrain.

Y axis :

It is the vertical axis on the screen. For the map, it is the axis that goes from South to North. The origin of the axis is at the bottom of the terrain.

Z axis :

It is the altitude axis.

Landscape :

The landscape is the general word for the characteristics, the parameters and all the elements that enable to render a picture. The landscape files of Vue dEsprit have the extension "**.psg**".

Noise :

A noise is a series of random numbers such that there exists no relationship between one value and its followers.

Iteration degree :

The iteration degree represents the number of times an algorithm has already been repeated. For a fractal calculation, it is linked to the scale of perturbation of the terrain. For each iteration, the scale is divided by 2.

Iteration :

Repetition of an algorithm.

Fractal dimension :

The dimension of a fractal object is a non integer value that represents the complexity of the object you consider. This complexity is the same whatever the scale.

Fractal model :

The fractal model specifies that the structure of the fractal object does not depend on the scale at which the object is considered.

Perturbation :

Local modification of the surface.

Key point or key color :

A key point is a point at which the user defines a behavior.

For example, in a color table, a key point (then called key color) will specify that at a given position, the generated color is the one you indicate. Between the key points, Vue dEsprit manages alone to generate intermediate values.

Spline :

It is a succession of links of degree 3 between key points.

Slope :

The slope of a curve at a point is the pitch of the curve at this point, that means, the ratio of the vertical variation on the horizontal variation at this point.

One distinguishes the left slope and the right slope. Usually, they are equal, except for angular points.

Linear :

A curve is linear when constituted of segments. Its slope suddenly changes for each new segment.

Smooth :

A curve is smooth when its slope varies slowly and continuously.

Layer:

A layer is an elementary function that gives a value in the range 0 to 1 for any point of the space. A certain number of characteristics are linked to the layer, like its scale, its origin and its relative amplitude.

Sine wave:

It is a layer that gives the product of the sinus along the 3 axis (sinX*sinY*sinZ).

Triangular :

It is a layer that gives values looking like saw teeth.

Rectangular :

It is a layer that gives values looking like crenels.

Layer amplitude :

It is the average depth of the perturbations of the layer, relative to the other layers.

Origin of the layer :

It is the departure point of the layer.

To shift the layer in a certain direction, modify consequently the origin of the layer.

Scale :

It is the ratio of zooming or reduction of a layer along an axis. To zoom a layer along an axis, increase the scale along the corresponding axis, to reduce, reduce the scale.

If the scale is equal to 0 along one axis, Vue dEsprit considers that the layer does not vary along this axis.

3D :

3 dimensions. The space is constituted of 3 axis : X, Y, Z, and is then tri-dimensionnal.

Saturation :

When you exceed a limit value. The given value is then the limit value.

Filter :

The filters are used to represent profiles (cracks, transparency level, bump depth...).

Basically, they enable to transform a number in the range 0 to 1 into an other number in the range 0 to 1, following a curve given by the user.

To modify a filter, double-click on it or select the option edit of the menu you get when you click with the right mouse button above.

Color table :

The color table are used to indicate variable colors.

Basically, they enable to transform a number in the range 0 to 1 into a color, following a gradation defined by the user.

To modify a color table, double-click on it or select the option edit of the menu you get when you click with the right mouse button above.

Function :

The functions are used every time it is necessary to indicate a value depending on a position. For example, to indicate a variable transparency factor (depending on the position) of a material.

Basically, the functions enable you to associate to any point in space a value in the range 0 to 1.

The function is represented with a black and white picture indicating the function value on an objects surface (sphere, cube, cone...). If the function value is equal to 0 at a point, this point is black ; if the value is equal to 1, the point is white.

To modify a function, double-click on it or select the option edit of the menu you get when you click with the right mouse button above.

Material :

A material characterizes the appearance of an object. It is represented by a picture of an object (sphere, cube, cone...) dressed up with the material.

To modify a material, double-click on it or select the option edit of the menu you get when you click with the right mouse button above.

Specular intensity :

It is the intensity of the spots of light created by the specular reflections.

Specular highlights :

It is the size of the spots of light created by the specular reflections. The more brilliant the surface is, the more concentrated the spots are. A mat surface has no specular reflections. A satiny surface has spots with high intensity and small concentration.

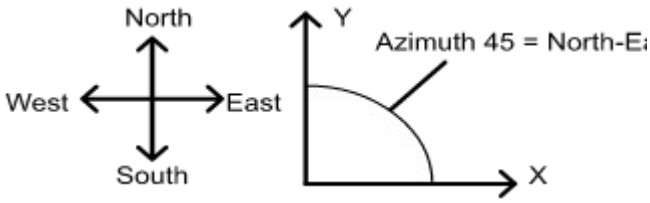
The physical explanation of the specular reflections is that, any surface, apparently smooth, is constituted of micro reflecting facets randomly distributed around an average value
. The brilliance is linked to the standard deviation of this distribution.

Normal :

The normal to a surface is the local perpendicular to the surface. Modifying the normal of a surface will change the local orientation of the surface.

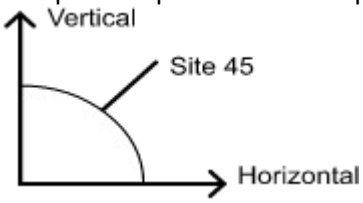
Azimuth :

The azimuth is the angle compared to the North, in the horizontal plane. It is expressed in degrees. An azimuth of 0 corresponds to the North, 90 to the East, 180 to the South and 270 to the West.



Pitch :

The pitch corresponds to the angle made with the horizontal line. It is expressed in degrees. A pitch equal to 0 corresponds to the horizontal line, a pitch equal to 90 to the vertical.



Apparent size :

It is the size (expressed in pixels) of an object on the final picture.

Focal distance :

The focal distance of a lens indicates the angular aperture of the lens, that means, the size of the field of view of the lens. It can be assimilated to the magnifying ratio of the lens.

A focal distance of 50 mm corresponds approximately to the human vision. A focal distance of 25 mm divides by 2 the apparent size of the objects, a focal distance of 400 mm multiplies by 8 their sizes.

In a physical point of view, the focal distance of a lens is the distance at which all the light rays that reach on the lens gather in one point.

Lens :

It is the virtual optical element through which Vue dEsprit renders the picture of the landscape.

It is defined by its focal distance.

Picture :

It is a numerical photography of your landscape . Vue dEsprit renders it following the characteristics of the camera.

You can save the picture on the disk under the formats BMP, Targa, Gif or JPEG with 256, 65.000 or 16.000.000 colors.

Color temperature :

The color temperature refers to the color of the light emitted by an object which is at a given temperature.

In photography, we speak of a warm light to describe the reddish light of a sunset, and of a cold light to describe the blue light emitted by the sky.

Refracted light :

The refracted light is the light that crosses the surface and goes inside the transparent environment.

Fade out :

It is the absorption of the luminous ray by the environment it crosses.

Specular reflections :

The specular reflections determine the mat or brilliant aspect of a surface, that means, the capacity of a surface, reflective or not, to reflect light. Thanks to this phenomenon, you can see spots of light on the surface, in the direction of the light source.

Control the specular reflections with the intensity and the brilliance.

Multitask :

It is the capacity of Vue d'Esprit to render a picture while you use the computer for an other activity. Of course, the calculation of the picture is then longer.

Gouraud shading :

The Gouraud shading of a facet consists in averaging the normal of the facet with the normal of the adjoining facets, so as to avoid some rough changes of the normal on the side of the facet.

You get a surface which appears to be smooth and you cant see the facets any more.

Camera :

The virtual camera allows you to visualize your landscape. It is defined with its position, its orientation and its focal distance.

Meteorological parameters :

It is the set of characteristics that control the meteorological effects of the landscaoe. It contains the sun, the light, the sky and clouds, the water and waves, the mist, the fog and the fog layers parameters.

Demo version :

This version is identical to the commercial version except for the following restrictions :

- size of the pictures limited to 320x240,
- no reflections and refractions in the water
- no cast shadows.

Observation point :

It is the place of the camera, and the hence place from where the terrain is observed.

Picture of a material :

Thanks to this picture you can identify the materials. They represent an object (sphere, cone cube....) dressed up with the material.

To load the material editor, you must double click on the picture of the material, or select the option **Edit material** of the menu you get when you press with the right mouse button above the picture.

Picture of a function :

Thanks to this picture you can identify the functions. They represent an object (sphere, cone, cube...) on which the function is projected.

To load the functions editor, you must double click on the picture of the material, or select the option **Edit function** of the menu you get when you press with the right mouse button above the picture.