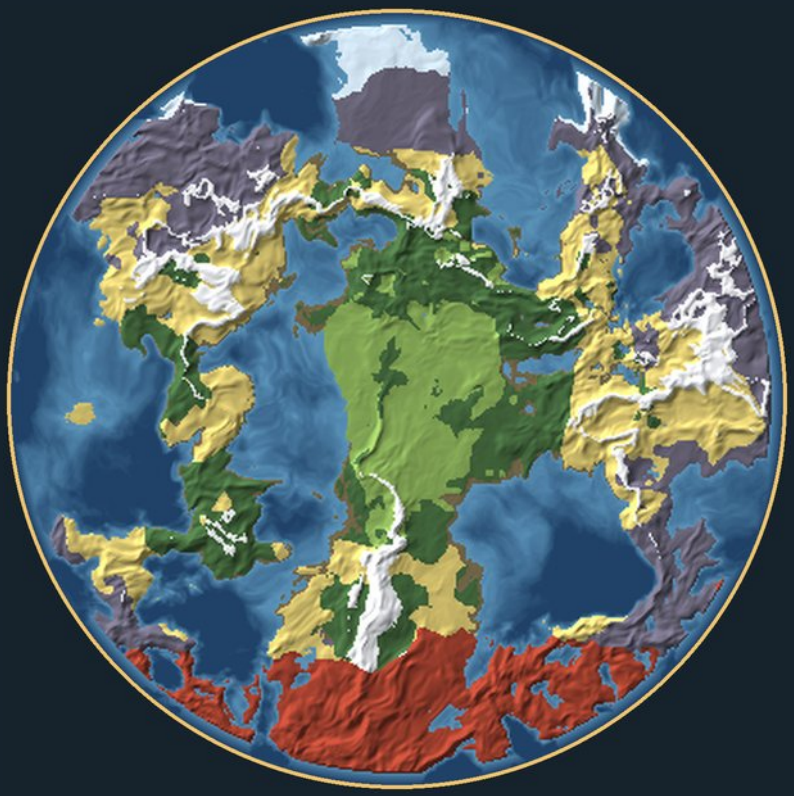

Export & Import

the easy guide to Better Continents 0.10.x

Turn your Valheim world into pictures, change them, and make a new world from them.

Written by Wubarrk, with Claude (Anthropic) as the drafting agent

For Valheim 1.0 and Better Continents 0.10.x (github.com/RGlabs84/BetterContinents10)

24 September 2026, updated 4 and 5 October 2026

Written for players who have never edited a config file or a heightmap.

Every picture in this guide is a drawing, not a screenshot: the game looks different.

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Start here: what export and import do

Better Continents 0.10.x can turn a Valheim world into pictures, and pictures back into a world.

Export copies the world you are standing in into a folder of pictures (PNG files). One picture shows how high the ground is, one shows which biome is where, one has a dot for every boss, trader and dungeon, and a few more hold the forests, the Ashlands heat, the lava and the rest. Nothing in your world changes.

Edit is up to you. Open the pictures in an image editor and change what you like: raise a mountain, paint a new island, move a boss, or cut a piece out of one world and paste it into another.

Import turns the folder back into a *preset*: a ready-made recipe for a world that you pick on Valheim's New World screen. You press Done, and Valheim builds a new world from your pictures.

Illustration, not a screenshot: from your world to a folder of pictures, and from the pictures to a new world.

What comes along, and what stays behind

Comes along to the new world	Stays in the old world
the shape of the land and the sea floor	buildings, and anything else players placed
which biome is where	ground players dug, raised or flattened
forests, the Ashlands heat and lava, the Mistlands ground cover	items, portals, tamed animals
alt biomes (Dark Meadows, Wolf Mountain and the rest)	the explored map, and which bosses were beaten there
every location: start temple, bosses, traders, dungeons	

The old world is never changed. The new world is a separate world next to it.

What is new in 0.10

If you used the export with Better Continents 0.9.x, these are the differences. Your old exports and presets still work, and a preset still makes the world it always made.

Each world has a *settings version*. The differences below belong to worlds of the newest version, 12, which is what most worlds made from an export get, 0.9.x exports of a world of the normal size included. A world gets the older version, 11, and plays as it did in 0.9.x, when it is made from one of the presets that come with the mod, from a preset that 0.9.x saved, from an export of a world that was resized under 0.9.x or made under Expand World Size at another size, or while the testing setting `Override version` is 11 (every world that 0.9.x made is version 11 too). Chapter 3 shows how to read a world's version.

- **Heights are stored for Heightmap Amount 1** (it was 2): the picture holds ground from -30 m to 170 m on the game's scale, where the sea is at 30 m (60 m under the sea to 140 m above it), and ground higher than that is clipped. Amount 2 is one setting away for worlds with very high mountains (chapters 2 and 4).
- `heightmap.png` **records its Heightmap Amount and Sea Level inside the PNG**, and a new world that reads it at other values warns in the log (chapters 4 and 8).
- **The pictures cover the world's size.** In a version 12 world they span its World Size + Edge Size on each side of the middle: 21 km in a normal world (chapters 2 and 4).
- **Biome precision goes up to 31** in a version 12 world (chapter 6).
- **The commands:** `bc_export server` also answers the admin who asked, and `bc_twins` finds doubled vegetation (appendix A).

The whole thing in four steps

1. **Turn on the export HUD** (the export's on-screen window). Chapter 1.
2. **In your world, press F7 and then Start export.** Wait a few minutes. Chapter 2.
3. **Go to the main menu and make a New World.** In the Better Continents box, pick the preset named after your world and the time of the export. Chapter 3.
4. **Press Done.** Valheim builds the new world.

Chapters 4 and 5 show how to edit the pictures and how to cut and paste between worlds. Chapter 8 lists what can go wrong and how to fix it. Chapter 9 is for whoever runs a server: how to get the world to the players faster, or before they even join.

Words used in this guide

Word	What it means
export folder	the folder one export writes, `BetterContinents/<world>/export-<date>-<time>/`
preset	a saved world recipe: a file in `BetterContinents/presets/` that the New World screen lists
config	`BetterContinents.cfg`, the text file with Better Continents' settings, in `BepInEx/config/`
console	Valheim's command line: press F5 to open and close it
HUD	the status box and the window Better Continents draws over the game
heightmap	a grey picture of the ground: the brighter a pixel, the higher the ground
legend	a `.txt` file next to a colour picture that says what each colour means
pixel	one dot of a picture; in a normal export one pixel is about 5 m of the world

What you need

- **Valheim 1.0.**
- **BepInEx**, the mod loader. A mod manager such as Gale or r2modman installs it for you.
- **Better Continents 0.10.x.** The status box of chapter 1 shows the exact version in its title.
- **For editing: an image editor that can save a 16-bit greyscale PNG**, for the heightmap. A normal picture has 256 shades of grey, which stores the ground's height in steps of about 0.8 m, so slopes become stairs. A 16-bit picture has 65,536 shades: steps of about 3 mm.

Editor	Price	Heightmap (16-bit grey)	Colour maps
GIMP	free	yes	yes
Krita	free	yes	yes
Photoshop	paid	yes	yes
Paint.NET	free	**no**: it works in 8 bits	yes

You do not need cheats (devcommands) to export or import. Configuration Manager, a separate mod, makes settings easy to change in the game, but a text editor works as well.

How to read this guide

- Every chapter starts with an **In short** box. If it is all you need, skip the rest of the chapter.
- Steps are numbered, one action each. After a step, a line starting with **You see:** says what should happen.
- Green boxes are tips. Red boxes are mistakes worth avoiding. Blue boxes are good to know.
- Every picture is a drawing made for this guide, not a screenshot. The game looks different; the drawings show where things are and what they say.

License

Better Continents: Export & Import, the easy guide was written by Wubarrk, with Claude (Anthropic's model) as the drafting agent, and is released under the **GNU General Public License, version 3** (GPL-3.0), the licence of the Better Continents Guide it accompanies, so that the two documents can be shipped and changed together under one licence. Copyright 2026 Wubarrk.

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This guide describes Better Continents 0.10.x as its source code is written: the command names, settings, defaults, file names and messages were copied from the code, and the examples of the export's text files follow what the code writes (the numbers in them are examples). The pictures are drawings, not screenshots. Where the game shows something different from this guide, the game is right; please report it (see chapter 8).

Better Continents is free software under the GNU Lesser General Public License, version 2.1 (created by billw2012, maintained by Jere Kuusela from 2023 to 2026 and by Wubarrk since September 2026). The Better Continents Guide is GPL-3.0 (written by billw2012). Neither is reproduced here beyond short statements of how the mod behaves. Valheim is the property of Iron Gate Studio; the menu labels quoted here are the game's own English texts, quoted so that you can find the buttons.

Attachment. The file `export-guide-source.zip` is attached to this PDF; open your PDF viewer's attachments panel to save it. It contains:

- `docs/`: the Markdown source of this guide and its pictures;
- `tools/make_figures.py`: the script that draws every picture (the maps are made up from noise);
- `build_export_guide.py` and `build_pdf.py`: the build scripts (the second is the Better Continents Guide's renderer, which the first reuses);
- `LICENSE`: the GPL-3.0 text.

1 Turn on the export HUD

> **In short:** set `Hud` to `true` in the `[09 BetterContinents.Export]` section of `BetterContinents.cfg`, or tick **Hud** in Configuration Manager. In a world, **F9** then shows a small status box and **F7** opens the export window. Prefer typing commands? You can skip this chapter: chapter 2 shows the console way too.

The HUD (heads-up display: the box and the window Better Continents draws over the game) is off when you first install the mod. It only ever shows while you are in a world, never in the main menu.

Way 1: in the game, with Configuration Manager

Configuration Manager is a separate, free mod that lists the settings of all your mods inside the game. Many mod packs already include it; search your mod manager for "Configuration Manager" if yours does not.

1. **Start Valheim and load any world.**

   You see: your world, as usual.

2. **Press F1** (Configuration Manager's own key).

   You see: a window listing your mods and their settings.

3. **Find Better Continents, and in it the section `09 BetterContinents.Export`.**
4. **Tick Hud.**

   You see: at once, a dark box with a gold title, *Better Continents 0.10.x export*, near the top-left corner of the screen.

5. **Press F1 again** to close Configuration Manager.

Way 2: edit the config file

The config file is a plain text file named `BetterContinents.cfg`. BepInEx writes it the first time the game starts with Better Continents installed.

1. **Find the file.** It is in the `BepInEx/config/` folder:
   - with a mod manager (Gale, r2modman, Thunderstore Mod Manager): inside your profile's folder. Every manager can open that folder for you, and most have a config editor that opens the file directly;
   - without a mod manager: inside the Valheim game folder (in Steam: right-click Valheim, then Manage, then Browse local files).
2. **Open it with a plain text editor**: Notepad on Windows, gedit or Kate on Linux. Not Word.
3. **Find the section `[09 BetterContinents.Export]`**, near the end of the file.
4. **Change `Hud = false` to `Hud = true`, and save the file.**

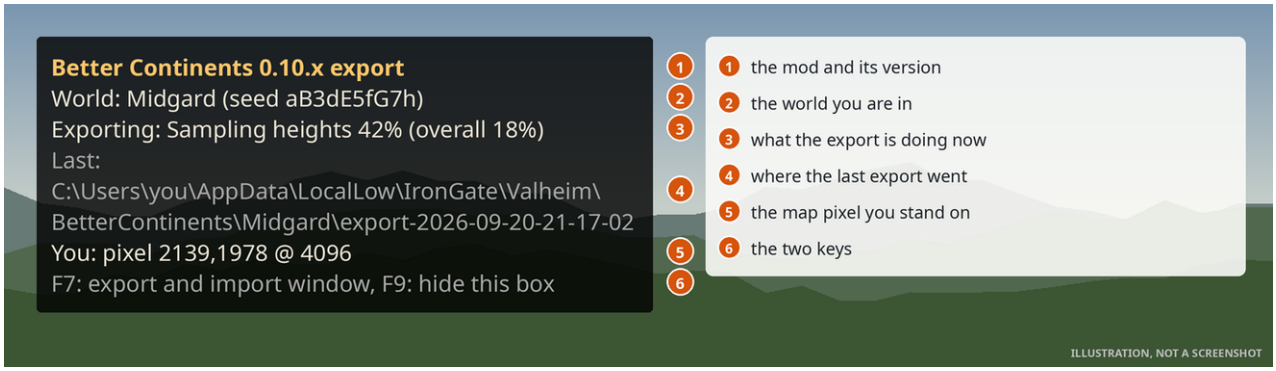
   You see: if the game is running and you are in a world, the status box appears within a second or so. No restart is needed: Better Continents reads the file again whenever it changes.

The section looks like this (the real file has comment lines starting with # above every setting):

```
[09 BetterContinents.Export]
Hud = true
Allow Export = true
Hud Hotkey = F9
Window Hotkey = F7
Default Size = 4096
Default Heightmap Amount = 1
Default Sea Level = 0.5
```

Watch out: on a multiplayer server, the server's own Hud setting is used instead of yours (chapter 7). If the box never shows up on a server, ask the server's owner to turn Hud on in the server's config.

The status box (F9)



Illustration, not a screenshot: the status box while an export runs, with its lines numbered.

	Line	What it tells you
1	Better Continents 0.10.x export	the mod and its exact version; the HUD needs 0.9.0 or later
2	World: Midgard (seed aB3dE5fG7h)	the world you are in, and its seed
3	Status: Idle, or Exporting: …	what the export does now: the step, how far the step is, and how far the whole export is
4	Last: …	the folder of the last export you made since the game started
5	You: pixel 2139,1978 @ 4096	where you stand, as a pixel of a 4096 px export: 2139 pixels from the left (west) edge and 1978 from the top (north) edge. Chapter 4 uses it to find places in the pictures
6	F7: …, F9: …	the two keys

The box can show three more lines: *Importing: …* while a preset is being made, *Error: …* after an export failed, and *Cannot export: …* with the reason when you may not export right now.

Press F9 to hide the box, and again to show it.

The window (F7)

Press F7 to open the export and import window, and again to close it. It has two tabs, **Export this world** (chapter 2) and **Import an export** (chapter 3).

While the window is open, the mouse pointer is free and the game ignores your clicks and number keys, so you can click and type in the window. You can still walk. Drag the window by its title to move it.

> **Good to know:** the two keys only react to a plain key press, with no Shift, Ctrl or Alt held. They are ignored while you type: in the chat, the console, a sign, a map pin, the build menu's search box, or one of the window's own number fields. Click an empty part of the window to let go of a number field.

Change the keys

In the same section, `Hud Hotkey` (F9) and `Window Hotkey` (F7) set the two keys. Any key name works (F1 to F12, a letter, and so on), and `None` turns a key off. The change applies at once.

All the settings of the Export section

Setting	Default	What it does
`Hud`	false	shows the export HUD in a world
`Allow Export`	true	on a server: whether connected players may export the world (chapter 7)
`Hud Hotkey`	F9	shows or hides the status box
`Window Hotkey`	F7	opens or closes the window
`Default Size`	4096	the size of an export unless you pick another (128 to 8192)
`Default Heightmap Amount`	1	how heights are stored; leave it at 1 unless your world has ground more than 140 m above the sea (chapter 4 explains)
`Default Sea Level`	0.5	how heights are stored; leave it at 0.5

All seven apply at once, while the game runs. Every other Better Continents setting only matters when a new world is created (chapter 3), with three exceptions: `Settings Transfer Rate` (chapter 9) and `Map Memory` apply at once too, and `Override version` is read at every save (leave it empty).

> **Good to know:** `Default Heightmap Amount` was 2 in Better Continents 0.9.x. A `BetterContinents.cfg` that still holds that old default is set to 1 once, and the log says so; a 2 you choose afterwards stays.

2 Export your world

> **In short:** stand in the world, press **F7**, leave every map ticked, keep the size at 4096, press **Start export** and wait until it says Done, usually a few minutes. Or type `bc_export` in the console (F5). The pictures land in `BetterContinents/<world>/export-<date>-<time>/` in Valheim's save folder, and a New World preset is made for you.

This is the export window, on its **Export this world** tab. The steps below go through it.

Illustration, not a screenshot: the Export this world tab, its parts numbered.

	Part	What it is
1	the two tabs	**Export this world**, and **Import an export** (chapter 3)
2	the maps	every picture the export can write; untick one to leave it out
3	the hint	what the map under the mouse pointer holds and costs
4	Size	how many pixels each picture has on a side
5	Heightmap Amount, Sea Level, Heat Scale	how heights and heat are stored in the pictures: keep 1, 0.5 and 10
6	three options	how heights, forest and the world's edge are stored: keep them as they are
7	the estimate	the pictures' size, the memory, and a rough time
8	Start export, Defaults	**Start export** starts; **Defaults** puts every choice back to the config's defaults
9	Into	the folder the export will write

Before you start

- **Load the world you want to export.** Single player is simplest. On a multiplayer server, read chapter 7 first: only the machine that runs the world knows where every location is.
- **Stay in the world until the export says Done.** You can keep playing while it runs; it works in the background. Leaving the world before the maps are written stops the export.
- **Nothing you do in the world changes the export.** It copies the land as the game generated it, not your buildings or digging.

Export with the window

1. **Press F7.**

   You see: the export and import window, on its **Export this world** tab.

2. **Leave every map ticked.** Point at a map's name to read, below the list, what it holds and what it costs.
3. **Keep the size at 4096.** See "Which size?" below.
4. **Leave Heightmap Amount at 1, Sea Level at 0.5 and Heat Scale at 10**, and leave the three options under them as they are.

   You see: the line *Waterline at 0.3; heights from -30 m to 170 m.* These are the game's own heights, which put the sea at 30 m: 60 m under the sea to 140 m above it.

   If your world has mountains higher than that, they are clipped to the top of the scale; the export tells you how many pixels. Type 2 in Heightmap Amount to keep them (*heights from -30 m to 370 m*, up to 340 m above the sea), and read the note under "The heightmap" in chapter 4 first.

5. **Read the estimate** under the options: how much memory the export needs and roughly how long it takes.
6. **Press Start export.**

   You see: two progress bars, the current step and *Overall*. The F9 box shows the same, and the console (F5) says *World export started*.

7. **Wait.** Close the window with F7 if you like, and keep playing.

   You see: at the end, the window's *Last export* part, with the folder and a short summary, and in the console *World export finished in … s*.

Every map in one line

Tick	Files	What it holds
Heightmap	`heightmap.png`	how high the ground is, in 16-bit grey
Biomes	`biomemap.png`, `biomemap.txt`	which biome is where, one colour per biome
Locations	`locationmap.png`, `locationmap.txt`	one dot per location: start temple, bosses, traders, dungeons and the rest
Forest	`forestmap.png`	how dense the forest is, in 16-bit grey
Heat	`heatmap.png`	the Ashlands heat that burns boats and players, in 16-bit grey
Alt biomes	`altbiomemap.png`, `altbiomemap.txt`	the alt biomes (Dark Meadows, Wolf Mountain...) exactly where the game put them
Lava	`lavamap.png`	where the Ashlands lava is
Moss	`mossmap.png`	the Mistlands ground cover
Paint	`paintmap.png`, `paintmap.txt`	the paint on the ground of every biome, such as snow; it takes the most space
Sources	`sources/`	a Better Continents world's own maps, as it was made; nothing for a vanilla world
New World preset	a file in `BetterContinents/presets/`	the preset `<world> <date> <time>`, ready in the New World screen

> **Try this:** the first time, keep everything ticked. A map you untick is left to the game in the new world: the export then writes settings that let the game make that part itself, from the new world's seed. Only the heightmap is different: without it the new world gets a completely new land, which the other maps no longer fit.

Which size?

Size	One pixel is	Memory while it runs	Memory while the preset is made	Rough time
1024	20.5 m	about 40 MB	about 60 MB	well under a minute
2048	10.3 m	about 60 MB	about 140 MB	about a minute
4096 (default)	5.1 m	about 150 MB	about 470 MB	a few minutes
8192	2.6 m	about 500 MB	about 1.8 GB	ten minutes or more

These are the window's own estimates with every map ticked. Your computer and your world decide the real numbers. The pixel sizes are for a normal world, 21 km across; a version 12 world with another World Size has larger or smaller pixels, because the pictures span its World Size + Edge Size on each side.

- **4096 is right for almost everyone.**
- **2048 and up** keep the alt-biome map exact. Below 2048, alt-biome borders can move by a pixel.
- **8192** gives the finest detail but needs the most memory and makes the biggest files, and every player who joins a world made from it downloads the maps. If your computer is short of memory, untick **New World preset** and make the preset later with `bc_import` in the main menu (chapter 3).
- **For cut and paste between worlds**, export both worlds at the same size (chapter 5).

Export with the console instead

1. **Press F5.**

   You see: the console.

2. **Type `bc_export` and press Enter.**

   You see: *World export running; 'bc_export status' shows progress, 'bc_export cancel' stops it.*

3. **Type `bc_export status` whenever you want to see how far it has got.**

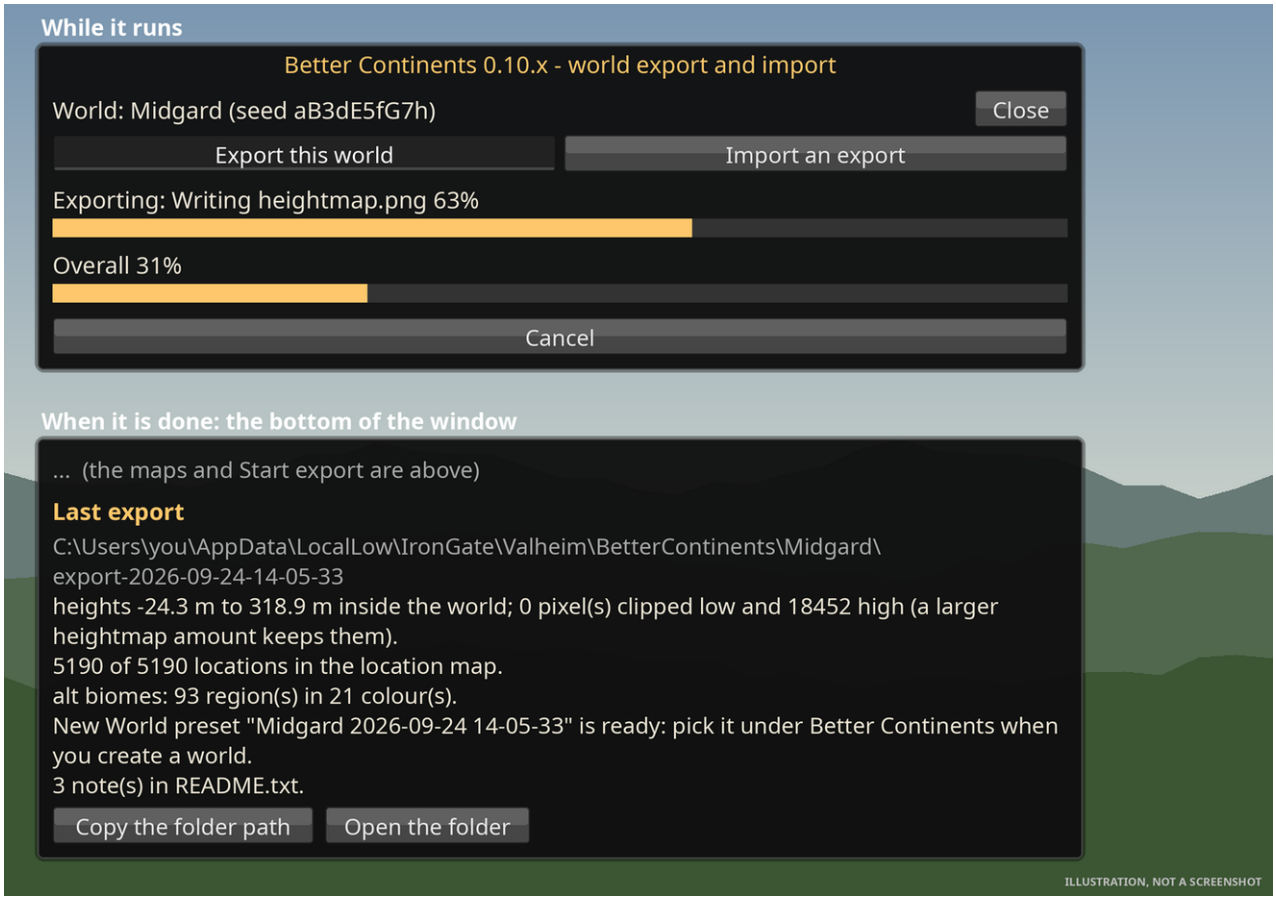
More examples:

```
bc_export                 every map, 4096 px, the usual settings, and a preset
bc_export 2048            the same at 2048 px
bc_export amount=2        heights stored for Heightmap Amount 2, to keep ground over 140 m
  above the sea
bc_export 8192 nopreset   8192 px without a preset (make it later with bc_import)
bc_export nopaint         everything but the paint map
bc_export status          how far it has got
bc_export cancel          stop the export and delete what it wrote
bc_export help            the full list of options
```

Appendix A lists every option.

> **Good to know:** `bc_export` works for every player; you do not need devcommands (cheats). On a server, the server decides whether players may export (chapter 7).

What the progress looks like



Illustration, not a screenshot: the window while an export runs, and the summary at the bottom of the window when it is done. The numbers are examples.

The steps come in this order; maps you unticked are skipped, and so are the lava and moss maps when the world has no Ashlands or Mistlands:

Sampling zone corners → Sampling heights → Writing heightmap.png → Writing lavamap.png → Writing mossmap.png → Writing paintmap.png → Sampling biomes → Writing biomemap.png → Sampling forest → Writing forestmap.png → Sampling heat → Writing heatmap.png → Sampling alt biomes → Writing altbiomemap.png → Placing locations → Writing locationmap.png → Copying sources → Making the New World preset → Writing export.cfg, README.txt and manifest.json → Done.

When it is done, the console shows a summary like this one (your numbers differ):

```
World export finished in 184 s: C:\Users\you\AppData\LocalLow\IronGate\Valheim\BetterContinents
  \Midgard\export-2026-09-24-14-05-33
World export: heights -24.3 m to 318.9 m inside the world; 0 pixel(s) clipped low and 18452
  high (a larger heightmap amount keeps them).
World export: 5190 of 5190 locations in the location map.
World export: alt biomes: 93 region(s) in 21 colour(s).
World export: New World preset "Midgard 2026-09-24 14-05-33" is ready: pick it under Better
  Continents when you create a world.
World export: 3 note(s) in README.txt.
World export: README.txt in the folder says how to make a world from it, in three ways.
```

- **heights**: the lowest and the highest ground inside the world, counted the game's way (the sea is at 30 m). *No pixel clipped* means every height fitted into the picture; a count of pixels clipped high means some ground is higher than the picture can hold (140 m above the sea at Heightmap Amount 1, which the game counts as 170 m), and export again at Amount 2 to keep it.
- **locations**: how many locations the location map holds. A line with *WARNING* means some are missing; chapter 7 explains why.
- **alt biomes**: how many alt-biome regions, in how many colours.
- **New World preset**: the preset's name. It is ready in the New World screen.
- **notes**: things worth knowing about this export, written in `README.txt`.

Where the folder is

Every export gets a folder of its own, named after the time it started:

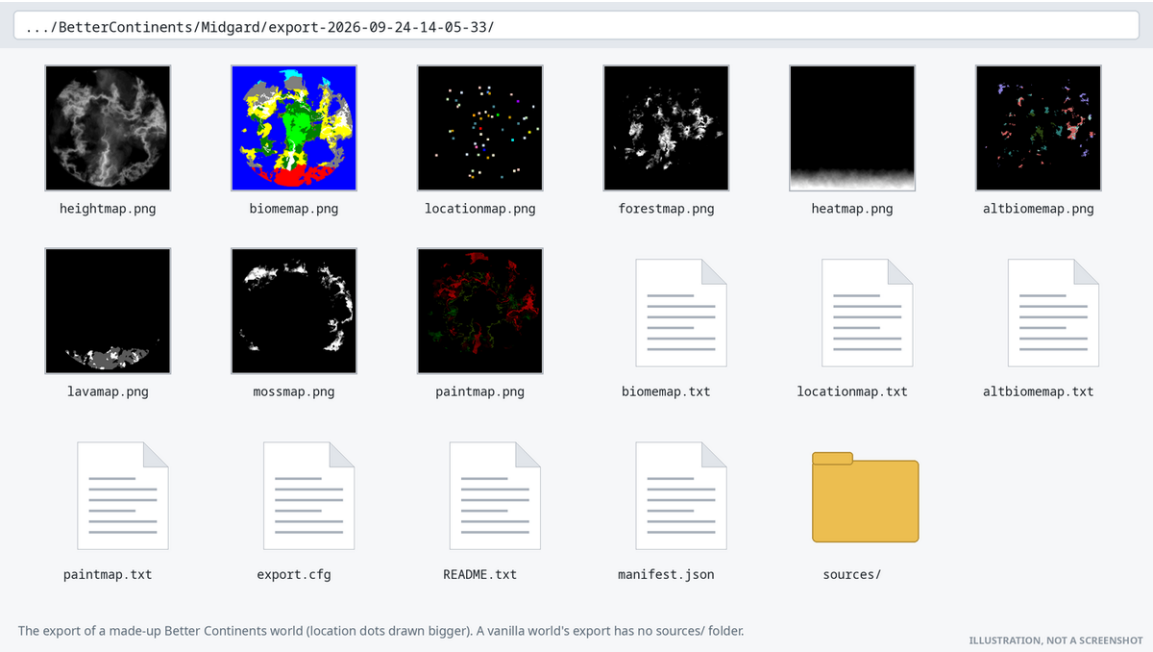
```
<save folder>/BetterContinents/<world>/export-2026-09-24-14-05-33/
```

The save folder is the one where Valheim keeps your worlds and characters:

Where Valheim runs	Save folder
Windows	`C:\Users\<you>\AppData\LocalLow\IronGate\Valheim`
Linux, the native game	`~/.config/unity3d/IronGate/Valheim`
Linux, the Windows game under Proton	`~/.local/share/Steam/steamapps/compatdata/892970/pfx/drive_c/users/steamuser/AppData/LocalLow/IronGate/Valheim`
a dedicated server	the server's own save folder (chapter 7)

The easiest way there: after the export, press **Open the folder** in the window, which opens it in your file manager, or **Copy the folder path** and paste the path into your file manager's address bar. On Windows the AppData folder is hidden: paste `%USERPROFILE%\AppData\LocalLow\IronGate\Valheim\BetterContinents` into the address bar of File Explorer.

> **Good to know:** an export never goes into a world's own save folder (`worlds_local`). A file there could be mistaken for part of a world save, so the export refuses such a folder.



Illustration, not a screenshot: an export folder, with every picture shown small.

What each file is

File	What it is	Edit it?
`heightmap.png`	how high the ground is, 16-bit grey: black is 60 m under the sea, white 140 m above it at the default Heightmap Amount 1 (340 m at Amount 2). It records its Heightmap Amount and Sea Level inside the PNG	yes
`biomemap.png`	which biome is where	yes
`biomemap.txt`	the biome colours (the biome map's legend)	rarely
`locationmap.png`	one dot per location	yes, carefully
`locationmap.txt`	which colour is which location	when you add a colour
`forestmap.png`	forest added to the game's own	yes
`heatmap.png`	the Ashlands heat	yes, carefully
`altbiomemap.png`	the alt biomes as the game placed them	yes
`altbiomemap.txt`	which colour is which alt biome, with a count of regions	when you add a colour
`lavamap.png`	the Ashlands lava	yes
`mossmap.png`	the Mistlands ground cover	yes
`paintmap.png`	the paint on the ground (snow and the like)	rarely; delete it after big height changes
`paintmap.txt`	a note that the paint map needs no colour list	no
`terrainmap.png`, `vegetationmap.png`, `spawnmap.png` and their `.txt`	only from a Better Continents world that had them: its ground colours, which plants grow where, which creatures appear where	yes
`sources/`	a Better Continents world's own maps and settings, as it was made; not loaded	no
`export.cfg`	the settings that load this folder (appendix B)	only to change a setting
`README.txt`	the export's own instructions, and notes about this export	no

File	What it is	Edit it?
`manifest.json`	every number about the export, for tools (appendix C)	no

Cancel an export

Press **Cancel** in the window, or type `bc_export cancel` in the console.

You see: *World export cancelled; its partial files were deleted.* Everything the export had written, its preset included, is gone again.

3 Make a new world from an export

> **In short:** an export always becomes a **new** world. The easy way: in the main menu make a New World, pick the preset `<world> <date> <time>` in the Better Continents box, and press **Done**. After editing the pictures, type `bc_import` in the console first. To keep editing and testing, use `bc_import ... config`, or set `Directory` in the config to the export folder.

Why it has to be a new world

Better Continents copies its settings and every map into a world when the world is created, and that world keeps its copy for good. Changing a preset, the config or the pictures afterwards changes nothing in a world that already exists. So an export always becomes a new world, next to the old one, and the old world stays as it is.

(Changing the maps of an existing world is possible with Better Continents' `bc` cheat commands, which are for the host or single player: on a player's own computer a change reaches only that player's copy of the settings, never the world. After each change Better Continents regenerates the world's zones itself, leaving the zones around what players built or worked, and around other players; the ground of those zones follows the change too, so a base can be left standing in the air or buried. It is meant for test worlds, and this guide does not cover it.)

Four ways

Way	Best when	Reads the pictures	Needs the folder afterwards
A. Pick the preset	right after an export	as they were when the export finished	no
B. `bc_import`	after you edited the pictures	as they are when you run `bc_import`	no
C. The config	while you keep editing and testing	as they are when you create each world	yes
D. `Directory` **only**	you would rather change one setting than type a command, or you moved the folder	as they are when you create each world	yes

Way D needs Better Continents 0.9.4 or later.

Way A: pick the preset

Every export makes a preset for you, named after the world and the time of the export, for example `Midgard 2026-09-24 14-05-33`.

1. **Leave your world:** press Esc and choose **Log Out**.

   You see: Valheim's main menu.

2. **Press Start Game, pick your character and press Start.**

   You see: the **Select World** screen, with your worlds.

3. **Press New World.**

   You see: the New World panel with **Name**, **Seed** and the **Better Continents** box.

4. **Type a name for the new world.** It needs at least 5 characters; **Done** stays greyed out until then.
5. **Type the seed.** For the closest copy of your old world, type the old world's seed: the F9 box and the export's `README.txt` show it. Another seed keeps the land, the biomes and the locations, but changes

the small things the pictures do not hold, such as where each tree and rock stands and the rooms of dungeons.

6. **In the Better Continents box, open the list and pick your preset.**

   You see: the preset's picture, a small map of the world.

7. **Press Done.**

   You see: Valheim creates the world and loads it. The loading screen stays up a moment longer while Better Continents draws the map. (Before 0.9.2, the message *Better Continents: generating minimap …* counted up instead.)

Illustration, not a screenshot: where the Better Continents preset list sits on the New World panel. The real screen looks different.

	Part	What to know
1	Name	at least 5 characters
2	Seed	the old world's seed for the closest copy
3	the Better Continents box	the list of presets: *Disabled*, the presets that come with the mod (Continents, Pangaea, Swirls, Vanillaish), yours, and *From Config*
4	the preset's picture	a small map drawn from the preset's heightmap and biome map
5	Done	creates the world

Good to know: the preset is a copy of the export folder as it was when the export finished. You can move or delete the folder and the preset keeps working. It does not see changes you make to the pictures afterwards: use way B for those.

Watch out: if the Better Continents box says **Disabled** when you press Done, the world is made without Better Continents: an ordinary Valheim world. Pick the preset first.

Way B: bc_import, after editing the pictures

`bc_import` makes the preset again from the pictures as they are now, and selects it for you. It works in the main menu and in a world, for every player.

1. **Press F5** to open the console.
2. **Type `bc_import list` and press Enter.**

   You see: a numbered list of your exports, newest first, for example:

```
Export folders in C:\Users\you\AppData\LocalLow\IronGate\Valheim\BetterContinents, newest
  first:
   1. Midgard  2026-09-24 14:05  4096 px  (preset made)   Midgard/export-2026-09-24-14-05-33
   2. Midgard  2026-09-20 21:17  2048 px   Midgard/export-2026-09-20-21-17-02
'bc_import <number>' makes that one a New World preset; add 'config' to load it from the
  config instead.
```

3. **Type `bc_import 1`**, with the number of the export you edited.

   You see: lines like these, the last ones a few seconds later:

```
World import: making the preset "Midgard 2026-09-24 14-05-33" from
  C:\...\Midgard\export-2026-09-24-14-05-33. This takes a few seconds; the game keeps
  running.
World import: Preset "Midgard 2026-09-24 14-05-33" is made and selected: create a New World
  to use it.
World import: 9 map(s): heightmap, biomemap, ...; Heightmap Amount 1, sea level 0.5, Biome
  precision 0, world 10000 m + 500 m edge.
World import: saved as C:\...\BetterContinents\presets\Midgard 2026-09-24
  14-05-33.BetterContinents.
```

4. **Make a new world as in way A.** The preset is already picked in the Better Continents box.

Other ways to name the folder:

Type	To import
`bc_import`	your newest export: of the world you are in; in the main menu, the export you made last, else the newest of the world you played last
`bc_import 2`	the export on line 2 of `bc_import list`
`bc_import Midgard`	the newest export of the world Midgard
`bc_import D:\Maps\My island`	any folder of Better Continents maps, even one you made yourself; spaces need no quotes
`bc_import status`	how the last import went
`bc_import help`	all of the above

> **Good to know:** making the preset again replaces the old preset of the same name that this folder made. A preset of the same name that something else made is kept: it is renamed, with `.old-<time>` added to its name.

Way C: the config, for editing and testing

With way C, every new world reads the pictures from the folder at the moment you create it. Change a picture, make another new world, and you see the change: no `bc_import` in between.

1. **In the console, type** `bc_import 1 config` (or press **Use as config** on the Import tab).

   You see:

   ```
   World import: BetterContinents.cfg now loads C:\...\Midgard\export-2026-09-24-14-05-33 (31
     setting(s) changed); the preset is "From Config".
   World import: your config as it was is saved as
     C:\...\BepInEx\config\BetterContinents.cfg.before-import-2026-09-24-15-12-40.
   World import: create a New World now; it reads the PNGs in the folder as they are when you
     create it. No restart is needed.
   ```

2. **Edit the pictures, and save them.**
3. **Make a new world as in way A.** The Better Continents box already says **From Config**.

   You see: a world made from the pictures as they were when you pressed Done.

4. **Look around, leave, change the pictures again, and make another new world.** Delete the test worlds you no longer need on the Select World screen.

> **Try this:** give test worlds short numbered names, such as `Test01`, `Test02`, so they are easy to find and delete later.

> **Watch out:** with way C, a world reads the folder when you press Done. Do not move or rename the folder while you still make worlds from it; if you do, point `Directory` at its new place (way D). A world that exists has its own copy and does not care.

To go back to your old settings, delete `BetterContinents.cfg` and rename the file ending in `.before-import-<time>` back to `BetterContinents.cfg`. Better Continents reads the file again within a second.

Doing it by hand: open `export.cfg` in a text editor, copy all of it, paste it at the very end of `BetterContinents.cfg` and save. A later line wins over an earlier one, so the pasted lines replace your settings, and `SelectedPreset = From Config` picks From Config. Keep a copy of your config first.

> **Watch out:** every Better Continents setting outside the Export section is a default for **new** worlds, with three exceptions: `Settings Transfer Rate` and `Map Memory` apply at once, and `Override version` is read at every save, so an edit changes the next save of a loaded world (leave it empty). Changing any other one never changes a world that exists.

Way D: set only Directory

With way D you change one setting by hand, `Directory`, and Better Continents takes the rest from the folder's `export.cfg` each time you make a world. As with way C, every new world reads the pictures as they are when you create it, but your own config is left as it is. Way D needs Better Continents 0.9.4 or later. Older versions read only the pictures this way and kept every other setting of your config, such as the default Heightmap Amount of 1, so a 0.9.x export (stored for Amount 2) came out almost all ocean (chapter 8).

1. **Copy the folder's path:** press **Copy the folder path** in the export window (chapter 2), or copy it from your file manager's address bar.
2. **Open** `BetterContinents.cfg` (in `BepInEx/config/`) in a text editor, or open Configuration Manager.

3. **In the section `[00 BetterContinents.Debug]`, set `Directory` to the folder's path, and save.** Leave every other setting as it is. For an export you copied to `D:\Maps\Midgard`, for example:

```
[00 BetterContinents.Debug]
Directory = D:\Maps\Midgard\export-2026-09-24-14-05-33
```

4. **Make a new world as in way A, but pick From Config** in the Better Continents box.

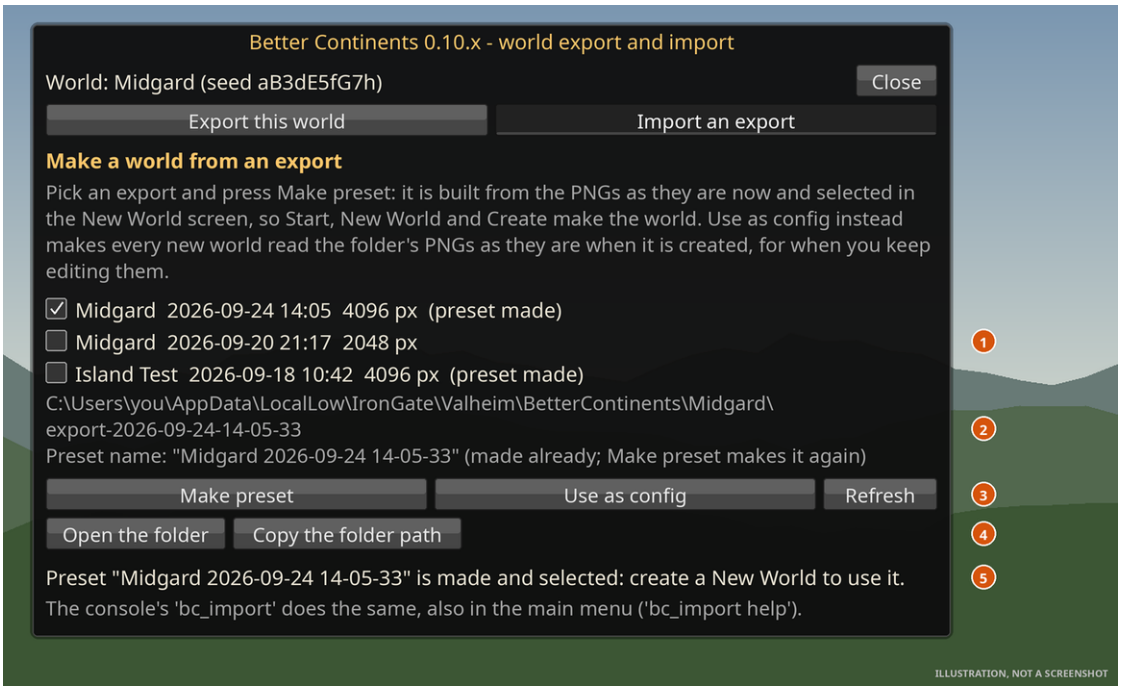
   You see: a world made from the pictures and the export's settings. The log (chapter 8) says *Directory … holds a world export, so the new world uses its export.cfg over BetterContinents.cfg* and lists every setting that differs from your config, for example *[01 BetterContinents.Global] Skip Default Locations = true (BetterContinents.cfg: false)*.

Watch out: with way D, `export.cfg` wins. Every setting it lists comes from it, whatever `BetterContinents.cfg` says; only the settings it does not list come from your config. To use a value of your own, for example another Heightmap Amount, change it in `export.cfg`, or delete `export.cfg` to take every setting from `BetterContinents.cfg` (the heights then still need the Heightmap Amount and Sea Level Adjustment the export recorded there: `Heightmap Amount = 1` and `Sea Level Adjustment = 0.5` for a default export). The same holds for way C, which points `Directory` at the folder too.

Good to know: way D writes nothing: `BetterContinents.cfg` keeps your values and `export.cfg` is only read. `Directory` is always the one in `BetterContinents.cfg`, so a folder you moved or copied works from where it is now; the `Directory` line inside `export.cfg` names the folder it was written in, and is ignored. A folder without `export.cfg`, such as maps you painted yourself, works as it always did: every setting comes from `BetterContinents.cfg`. A preset brings its own settings, so `Directory` does not change it.

The Import tab: ways B and C with buttons

In a world, press F7 and click **Import an export**:



Illustration, not a screenshot: the Import an export tab, its parts numbered.

	Part	What it does
1	your exports	newest first; *(preset made)* means it has a preset, *(unfinished)* means the export did not finish
2	the folder and the preset name	where the pictures are, and the name its preset gets
3	Make preset, Use as config, Refresh	way B, way C, and read the folders again
4	Open the folder, Copy the folder path	to find the pictures
5	the result	what the last import did

Check the new world

- The F9 box shows the new world's name.
- Open the map (M): the land you have explored looks like the pictures. You start at the start temple, where the location map put it.
- `bc_import status` in the console says how the last import went.
- `bc info` in the console (cheats on; it works on the machine that runs the world, and on a player's computer, with the Server Devcommands mod, it shows the settings the server sent) prints the world's settings version first: 12 for most worlds made from an export; 11 for a world made from an export of a world that was resized under 0.9.x (or made under Expand World Size at another size), from a preset of the mod or of 0.9.x, or while `Override version` is 11 (appendix B).

4 Edit the pictures

In short: keep every picture a square PNG of the same size, north at the top. Keep `heightmap.png`, `forestmap.png` and `heatmap.png` 16-bit grey. Paint the colour maps with a hard pencil in exact colours. Then make the preset again with `bc_import` (chapter 3).

The golden rules

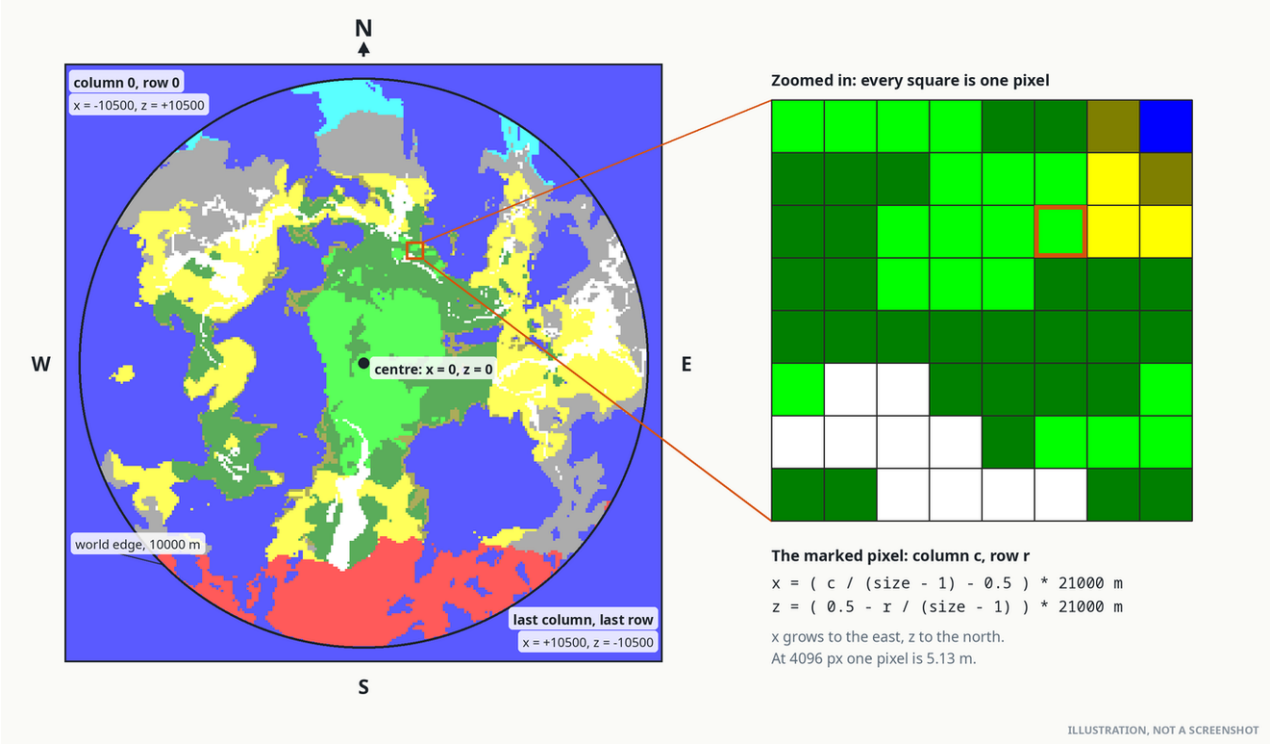
1. **Keep the file names.** The import looks for these exact names.
2. **Keep every picture square and the same size.** Never crop and never change the canvas size. Every picture covers the whole world square, 21 km on a side in a normal world (`totalSize` in `manifest.json` says for yours), so a cropped picture stretches the world.
3. **North is at the top, east on the right.** The middle of the picture is the middle of the world; the corners lie beyond the world's edge.
4. **Save as PNG, never as JPEG.** JPEG changes colours and heights a little everywhere.
5. **Keep `heightmap.png`, `forestmap.png` and `heatmap.png` 16-bit greyscale.**
6. **Paint the colour maps (biomes, locations, alt biomes) with hard edges and exact colours.** No soft brushes, no smoothing, no anti-aliasing.
7. **Keep the `.txt` legends next to their pictures.**
8. **When you are done, make the preset again** with `bc_import`, or use the config way (chapter 3).

Your image editor

Editor	16-bit heightmap	How to keep 16 bits
GIMP (free)	yes	the PNG opens in 16-bit; save with File > Export As, and in the PNG dialog leave the pixel format on automatic, or pick 16bpc GRAY. Do not change Image > Precision
Krita (free)	yes	the PNG opens in 16-bit grey; save with File > Export, leave "Force convert to sRGB" off and untick "Store alpha channel"
Photoshop	yes	save with File > Save a Copy (or Save As) as PNG. Export As and Save for Web always write 8-bit
Paint.NET	**no**	it keeps every picture in 8 bits per colour. Use it only for the colour maps and for the lava and moss maps

Watch out: editors show grey in different units: 0 to 255 (even in 16-bit pictures), 0 to 100 %, or 0 to 65535 (and Photoshop's 16-bit mode counts to 32768). The percentage is the same everywhere, so this guide gives it too: the waterline is 30 % at the default Heightmap Amount 1 (15 % at Amount 2).

Find a place in the pictures

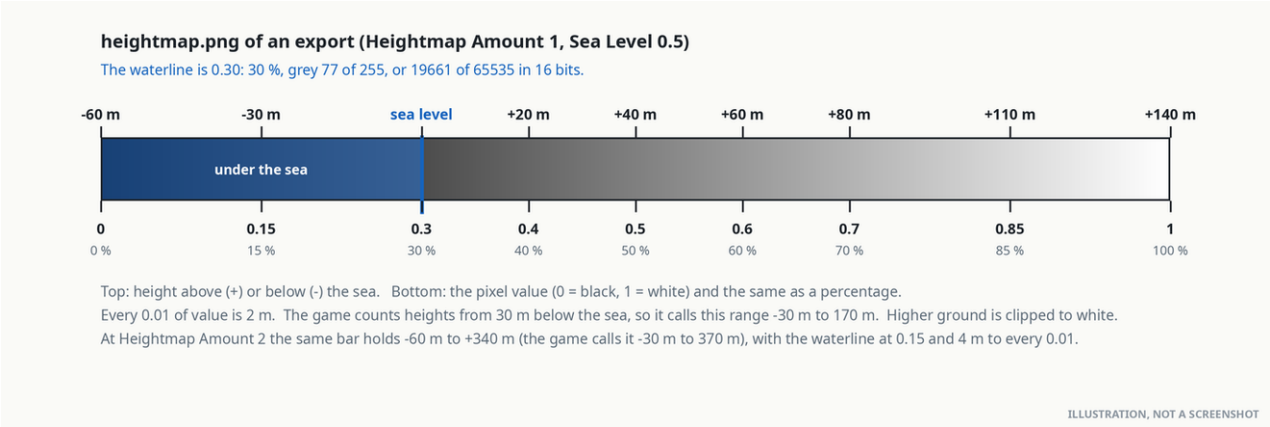


Illustration, not a screenshot: a picture of an export, north up, and how a pixel's column and row give its place in the world.

- The picture is a square; the world is the circle in it, 10,000 m from the middle to the edge in a normal world. Beyond the circle the land falls away into the sea.
- **To find where you stand**, read the F9 box in the game: *You: pixel 2139,1978 @ 4096* means 2139 pixels from the left and 1978 from the top of a 4096 px picture. Your editor shows the same two numbers for the mouse pointer, usually at the bottom of its window.
- The box counts for the size picked in the export window. Pick the size of your export there first.
- One pixel of a 4096 px export is 5.13 m of the world; of a 2048 px export, 10.3 m.

The heightmap: heightmap.png

The brighter a pixel, the higher the ground. An export stores heights like this (Heightmap Amount 1, the default):



Illustration, not a screenshot: the grey scale of an export's heightmap, with the waterline at 0.30.

Height	Value	Percent	8-bit grey	16-bit grey
60 m under the sea (black)	0	0 %	0	0
30 m under the sea	0.15	15 %	38	9830
sea level: the waterline	**0.30**	**30 %**	**77**	**19661**
20 m above the sea	0.4	40 %	102	26214
40 m above the sea	0.5	50 %	128	32768
90 m above the sea	0.75	75 %	191	49151
140 m above the sea (white)	1	100 %	255	65535

The rule behind the table: **height above the sea = 200 × value − 60 m**. Each 1 % of grey is 2 m.

> **Good to know:** ground higher than 140 m above the sea (170 m on the game's own scale) does not fit at Heightmap Amount 1: it is **clipped** to white, and the export tells you how many pixels. To keep tall mountains, export at **Heightmap Amount 2** (type 2 in the window, or `bc_export amount=2`). Amount 2 stores -30 m to 370 m: **height above the sea = 400 × value − 60 m**, the waterline is 0.15 (15 %, grey 38), white is 340 m above the sea, and each 1 % of grey is 4 m. The price is coarser steps: one 8-bit grey level is 1.6 m instead of 0.8 m.
>
> | Height at Amount 2 | Value | Percent | 8-bit grey | 16-bit grey |
> |---|---|---|---|---|
> | 60 m under the sea (black) | 0 | 0 % | 0 | 0 |
> | **sea level: the waterline** | **0.15** | **15 %** | **38** | **9830** |
> | 20 m above the sea | 0.2 | 20 % | 51 | 13107 |
> | 100 m above the sea | 0.4 | 40 % | 102 | 26214 |
> | 200 m above the sea | 0.65 | 65 % | 166 | 42598 |
> | 340 m above the sea (white) | 1 | 100 % | 255 | 65535 |

- **Keep the export's Amount.** `export.cfg` and `manifest.json` carry the Amount and Sea Level an export was made at, and so does `heightmap.png` itself (a PNG text chunk named `BetterContinents`, which reads like `Heightmap Amount = 1; Sea Level Adjustment = 0.5`; some image editors keep it). The new world must read the heights at those values. If it does not, the log warns (chapter 8).
- **Land is above the waterline, sea below it.** The waterline is 30 % at Amount 1 (15 % at Amount 2); a beach is just above it.
- **Use soft brushes, smudging and blur** on the heightmap: smooth slopes look natural. (That is the opposite of the colour maps.)
- **Never use auto levels, stretch contrast, normalize or equalize.** They move every height of the world.
- **Rivers:** paint them into the heightmap, below the waterline. The game's own rivers are switched off in a world made from an export, because the old world's rivers are already in the heightmap.
- **A new mountain also needs the Mountain colour in the biome map**, or it becomes, say, a very tall meadow. The biome map decides the biome; the heightmap only the height.
- **Mountains stop at white.** At Amount 1 the highest ground is 140 m above the sea. For taller mountains, export the world at Amount 2 first.
- **The world's edge:** past the world's radius (10,000 m from the middle in a normal world) the ground falls away into the sea, whatever you paint there.

The biome map: biomemap.png

Each biome has one colour. `biomemap.txt` lists them, and these are the colours an export uses:

Swatch	Biome	Hex	R, G, B
	None: left to the game	`000000`	0, 0, 0
	Meadows	`00FF00`	0, 255, 0
	BlackForest	`007F00`	0, 127, 0
	Swamp	`7F7F00`	127, 127, 0
	Mountain	`FFFFFF`	255, 255, 255
	Plains	`FFFF00`	255, 255, 0
	Mistlands	`7F7F7F`	127, 127, 127
	AshLands	`FF0000`	255, 0, 0
	DeepNorth	`00FFFF`	0, 255, 255
	Ocean	`0000FF`	0, 0, 255

- **Every pixel counts as the nearest colour of the list.** A blend of two colours can therefore turn into a third biome: a soft coast between Meadows and Ocean becomes a thin line of Mistlands. Paint with a hard pencil.
- **A place takes the biome that most of its 4 nearest pixels have.** Borders do not blend.
- **You may leave a biome out.** The locations that need it are then skipped: no Mistlands, no Queen.
- **A biome does not change the height.** Paint Mountain where the heightmap is high, and so on.
- **Inside each 64 m square, the ground follows the biomes more loosely than the picture.** Chapter 6 shows how to make it follow more closely.
- The mod's package has `BetterContinents.gpl`, a palette of these colours for GIMP and Krita.

The location map: locationmap.png

The location map is black, with one pixel for each location. `locationmap.txt` says which colour is which location, one line each: `Name: red,green,blue`.

- **To move a location**, paint its pixel black and draw one pixel of the same colour where you want it: the pencil tool, 1 pixel, no anti-aliasing.
- **To remove a location**, paint its pixel black.
- **To add a location**, draw a pixel in the colour of its line in `locationmap.txt`. If the location is not listed, add a line with the game's name for it and a colour no other line uses.

Watch out: three rules the game keeps you to.

- **Two touching pixels of the same colour become one location.** Keep black between them.
- **One location fits in each 64 m square of the world.** A second one in the same square is dropped. At 4096 px keep dots at least 13 pixels apart; at 2048 px, 7.
- **The location is built exactly where the dot is, even in the sea.** The game does not check. Put each dot where its location belongs: a boss on dry land of its own biome.

The main locations keep their usual colours in an export:

Swatch	Location	Who or what	R, G, B
	StartTemple	where every player starts	255, 0, 0
	Eikthyrnir	Eikthyr's altar	255, 153, 0
	GDKing	The Elder's altar	0, 255, 0
	Bonemass	Bonemass's altar	0, 255, 255
	Dragonqueen	Moder's altar	74, 134, 232
	GoblinKing	Yagluth's altar	255, 255, 0
	Mistlands_DvergrBossEntrance1	the Queen's entrance	153, 0, 255
	Vendor_BlackForest	Haldor, the trader	0, 0, 255
	Hildir_camp	Hildir, the trader	255, 105, 180

Every other kind of location gets a colour of its own, and the export writes it into `locationmap.txt`: always take colours from your export's `locationmap.txt`, not from memory.

> **Good to know:** you may see several dots for Haldor. The game keeps a few possible places for some locations and builds only one of them: the first one a player comes close to. The new world does the same.

An export from the machine that runs the world holds every location, and its `export.cfg` switches the game's own location placement off (`Skip Default Locations = true`): the new world gets the dots in the map and nothing else. So a dot you delete is a location the new world does not have.

The forest map: forestmap.png

- 16-bit grey. **Black means "the game's own forest here"**; the brighter a pixel, the more trees on top of it.
- In this form the forest map cannot make a place barer than the game makes it. To clear forests, export with **Exact forest** ticked (chapter 2): then black means no trees and white the densest forest, but the game's own forest pattern is part of the picture, which makes it harder to paint.

The heat map: heatmap.png

- 16-bit grey. **Wherever it is above black, the ground counts as Ashlands**: its weather, burning water and lava damage. White is the hottest.
- **Everywhere else it must be exactly black.** A faint grey smear from a soft brush turns that ground into Ashlands.
- When you paint Ashlands somewhere new in the biome map, paint heat there too, and a little way into the sea around it: hot water is what burns boats on the way in.

Alt biomes: altbiomemap.png

Alt biomes are Valheim's variations of a biome, such as Dark Meadows or Wolf Mountain. In the alt-biome map, each colour stands for one alt biome, or a set of them, named in `altbiomemap.txt`. A line looks like `Dark Meadows: 2D4613 # 3 region(s)`; everything after `#` is a note.

- **Black means no alt biome.** The export's settings (`Mode = PlantedOnly`) tell the game to add none of its own, so the map is all there is.
- **Paint a region black** to take its alt biome away; **paint it in a colour of the list** to give it that alt biome. Every patch you paint becomes a region of its own.

- **A colour only works on the biome its alt biome belongs to.** Dark Meadows painted over a meadow and the beach next to it changes the meadow and leaves the beach alone.
- **A new colour needs a new line** in `altbiomemap.txt`, such as `Wolf Mountain: 93C7BC`. The usual colours are in the palette `BetterContinents.gpl` and in the Better Continents Guide.
- **A name with `!` in front is forced**: the export adds it where the game's own rules would otherwise refuse that alt biome.
- From 2048 px up, the map matches the game's 12 m alt-biome grid exactly.

Lava, moss and paint

- `lavamap.png` (8-bit grey) only matters in the Ashlands. Lava wherever the grey is above 60 % (153 of 255); black means no lava.
- `mossmap.png` (8-bit grey) only matters in the Mistlands: its ground cover.
- `paintmap.png` (colour) is the paint on the ground in every biome, such as how deep the snow is. It keeps the old paint where you change the heights: after big height changes, delete it and make the preset again, and the game paints the ground itself.

Letting the game make a part itself

Delete that map from the folder, then make the preset again. Two maps need a matching change in `export.cfg` as well, or the new world ends up with none of them:

When you delete	Also set in export.cfg	Or else the new world has
`locationmap.png`	`Skip Default Locations = false` (section `[01 BetterContinents.Global]`)	only the start temple: no bosses, traders or dungeons
`altbiomemap.png`	`Mode = Random` (section `[08 BetterContinents.AltBiomes]`)	no alt biomes at all

> **Try this:** better still, untick the map before you export (chapter 2). The export then writes the right settings by itself.

Make the preset again

Run `bc_import` (chapter 3, way B). If you use the config way (way C) or `Directory` (way D), simply make another new world: since Better Continents 0.9.4 it reads the folder's `export.cfg` too, so a change made there counts as well.

5 Cut and paste between worlds

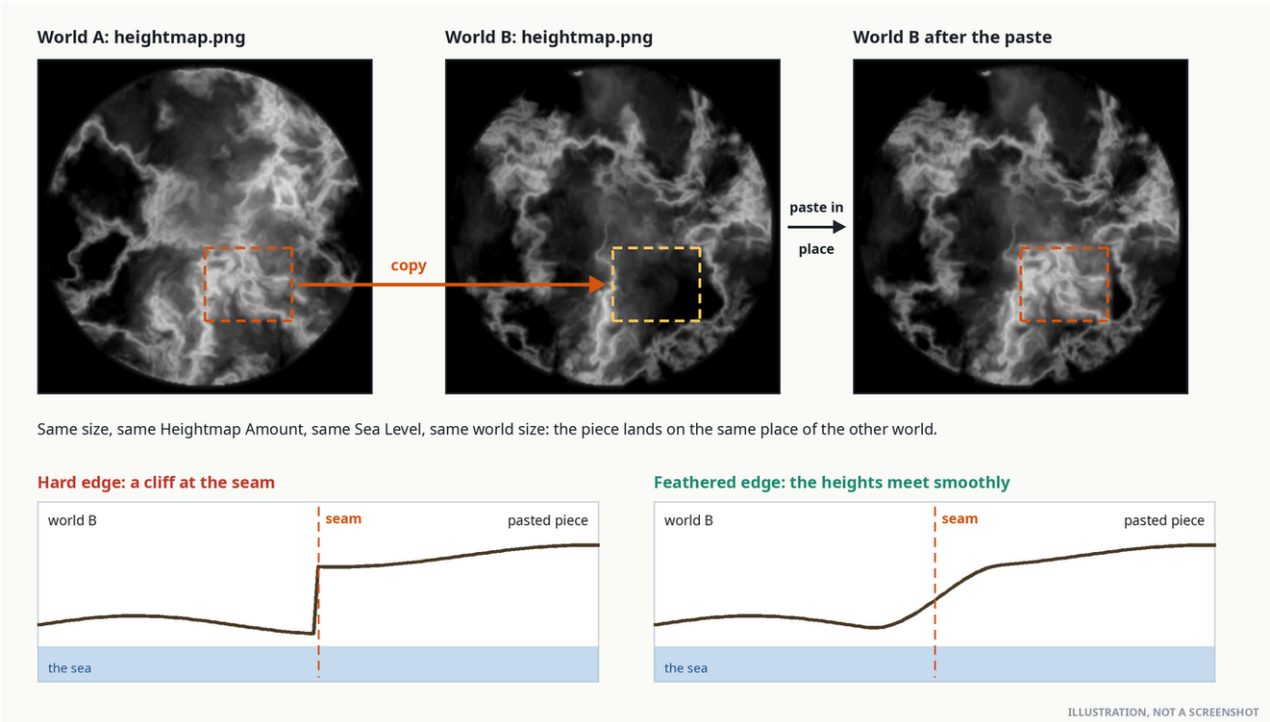
In short: export both worlds with the same size and the usual settings. Cut the same rectangle out of every picture of world A and paste it in place into world B's pictures. Feather the heightmap's edge so the land meets without a cliff; never feather the colour maps. Then `bc_import` world B's folder.

Two exports **line up pixel for pixel** when they agree on four numbers. Then a piece cut from one picture lands on exactly the same place of the other world, and its heights come out the same.

Must match	Where to check it	Usual value
the size of the pictures	`"size"` in `manifest.json`	4096
the Heightmap Amount	`"heightmapAmount"` in `manifest.json`	1 (2 for an export made with `amount=2`)
the Sea Level	`"seaLevel"` in `manifest.json`	0.5
the size of the world	`"totalSize"` in `manifest.json`	21000 (a normal world)

`manifest.json` is a text file in each export folder; open it with a text editor. Hand-made maps drawn for the same Heightmap Amount and Sea Level (1 and 0.5 for a default export), at the same size, line up with exports too.

Watch out: the exports of Better Continents 0.9.x were made at Heightmap Amount 2, and an export made now is at Amount 1 unless you ask for 2. Pictures made at different Amounts do not line up: a pasted piece would come out at the wrong height. Export both worlds again with the same `amount=`, and check that `heightmapAmount` is the same in both `manifest.json` files.



Illustration, not a screenshot: a piece of world A's heightmap pasted into world B, and the seam seen from the side.

A worked example: move a mountain range from world A to world B

This example uses GIMP; other editors have the same tools under similar names.

1. **Export both worlds** with the same size and the usual settings (chapter 2). Check the four numbers in both `manifest.json` files.
2. **Copy world B's export folder**, and work on the copy. The original stays as a spare.
3. **Open world A's `heightmap.png`, and the copy of world B's `heightmap.png`.**
4. **In world A's heightmap, select the rectangle around the mountains** with the Rectangle Select tool. Write down its position and size: GIMP shows them in the tool options.

   You see: the selection's corners, as pixel numbers.
5. **Feather the selection**: Select > Feather, 16 pixels.

   You see: the selection's corners become round. The feathered edge lets the heights of A and B blend over 16 pixels instead of meeting in a cliff.
6. **Copy** (Ctrl+C), **switch to world B's heightmap**, and **Paste In Place** (Edit > Paste In Place).

   You see: the piece sits at the same pixel position it had in world A.
7. **Anchor it** (Layer > Anchor Layer) and **save**: File > Export As, the same file name, 16-bit.
8. **Repeat steps 4, 6 and 7 for every other map**, with the same rectangle and **without** feathering for the colour maps: `biomemap.png`, `locationmap.png` and `altbiomemap.png`. The grey maps, `forestmap.png`, `heatmap.png`, `lavamap.png` and `mossmap.png`, and `paintmap.png`, may be feathered like the heightmap.
9. **Copy the missing legend lines.** For every colour in the pasted piece of `altbiomemap.png` or `locationmap.png` that world B's `.txt` does not list, copy that line from world A's `.txt` into world B's.
10. **Make the preset**: `bc_import` with the path of the copied folder (chapter 3), then make a new world.

The seam

Heights are read smoothly between pixels. Where two heights meet at a hard edge, the step between them becomes a slope just one pixel wide, about 5 m at 4096 px: a cliff. There are three cures:

- **feather the selection** before you copy, as in the example;
- **cut along the sea**, where both worlds are under water anyway;
- **smooth the seam afterwards**, with a soft brush or a blur along it, in 16-bit.

Biomes never blend: a place takes the biome most of its 4 nearest pixels have, so the border sits exactly where the colours meet.

What moves with the paste, and what does not

Moves with the pasted piece	Does not move
the shape of the land and the sea floor	buildings, dug ground, anything players placed: an export never has them
the biomes, and the alt biomes (with their legend lines)	where exactly each tree and rock stands: the new world's seed decides that
extra forest: the pasted woods keep their extra trees	the game's own forest pattern under them, which belongs to the new place
the Ashlands heat, lava and the Mistlands ground cover	the rooms inside dungeons
the locations whose dots are in the piece	locations whose dots you did not paste

Watch out: if both worlds have the same boss in their location maps, the new world gets both: two of Eikthyr's altars, say. Paint the one you do not want black.

Watch out: a dot must not touch another dot of its colour, and two locations never fit in one 64 m square of the world. Look along the edges of the pasted piece of `locationmap.png` for dots that now crowd each other.

6 Biome precision

In short: Valheim decides the ground's biome in squares of 64 m, so on the ground biome borders follow a 64 m grid and small patches can vanish. **Biome precision** 1 to 5 makes the ground follow your biome map more closely, down to 11 m, and a version 12 world can go up to 31, down to 2 m. It is a setting of the world, chosen before you create it: `Biome precision` in `export.cfg` or in `BetterContinents.cfg`. 0 is the game's own way. It works again in Better Continents 0.9.0.

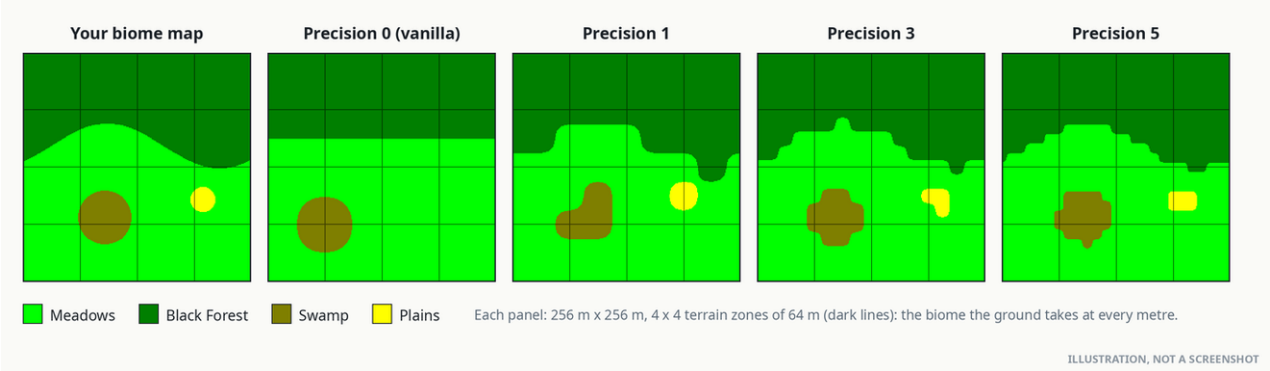
What it does, in plain words

Valheim builds the ground in squares of 64 m, called zones. For each zone it looks at the biome at the zone's four corners only, and everything inside the zone gets its biome from those four corners: the ground's textures, the grass, the plants and trees, and where creatures appear.

So on the ground, the borders between biomes follow the 64 m grid rather than the lines you painted, and a patch of biome that falls between four corners can disappear from the ground altogether, like the small yellow Plains in the picture below.

Biome precision makes each zone look at more points: with precision N, a grid of (N + 1) × (N + 1) cells per zone instead of one.

Precision	Cells per zone	One cell is about
0 (the game's own way)	1 × 1	64 m
1	2 × 2	32 m
2	3 × 3	21 m
3	4 × 4	16 m
4	5 × 5	13 m
5	6 × 6	11 m
7 (new worlds only)	8 × 8	8 m
15 (new worlds only)	16 × 16	4 m
31 (new worlds only)	32 × 32	2 m



Illustration, not a screenshot: the biome the ground takes, metre by metre, over 4 × 4 zones, drawn from the same rule the mod uses. At precision 0 the small Plains patch is gone; from precision 1 it is there.

It changes the ground's biome only. **The heights never change**, and neither does anything that is not decided per zone: the places the game picks for locations, for example, already follow the biome map.

When to raise it

- **Your biome map has small islands, thin strips or detailed borders**, such as a narrow swamp along a river, and you want the grass, plants and creatures to follow them.
- **You notice grass or trees of one biome running tens of metres past a border you drew.**

Leave it at 0 for worlds that should behave exactly like the game's own. An export copies the old world's precision into `export.cfg`, so the new world matches the old one unless you change it.

The higher the number, the more the game has to work out each time it builds a piece of ground. Try 2 or 3 first.

Values above 5 work only in a version 12 world (chapter 3 shows how to read a world's version); an older world (settings version 11) reads them as 5. Each 64 m square then has (N + 2) × (N + 2) points to work out when it is built, 1,089 at 31 where the game's own way uses 4, so go up step by step and watch how the game runs.

How to set it

For a new world made from an export:

1. **Open the export's** `export.cfg` in a text editor.
2. **In the section** `[03 BetterContinents.Biomemap]`**, set** `Biome precision`, for example:

   ```
   [03 BetterContinents.Biomemap]
   Biome precision = 3
   ```

3. **Save it, and make the preset again with** `bc_import` (chapter 3). With way C or D, just make another new world: since Better Continents 0.9.4 it reads `export.cfg` in the folder, and the value there wins. (Before 0.9.4, way C needed it set in `BetterContinents.cfg` instead, under the same section.)

   You see: the import's summary says *Biome precision 3*.

In a world that exists, for testing (the host, with cheats on):

1. Open the console (F5) and type `devcommands`.
2. Type `bc b p 3`.

   You see: the loaded ground is built again with the new precision, and a *Zone regeneration* line in the console says how many zones are being reset. The world's zones are regenerated, so plants stand according to the new precision when you come near each zone. The world keeps the new value when it saves.

Watch out: `bc b p` regenerates the world's zones: Better Continents does it itself (or runs the command you put in its *Debug Reset Command* setting, if you did). Every generated zone is reset and generates again when somebody comes near, except the zones within one zone of something a player built, a tombstone, ground a player has worked (a field, a path, a road), or you inside a dungeon, and the zones another player's game has loaded around them. A location that reaches into more than one zone is kept or regenerated whole. Try `bc b p` in a test world, never in a world you care about.

Good to know: precision is a setting of the world. In multiplayer every player gets it from the world; nobody has to set anything on their own computer.

7 Multiplayer and servers

In short: the machine that runs the world (single player, the host, a dedicated server) can always export, and knows every location. A player on a server can export only while the server's **Allow Export** is on, and gets only the locations the map shows. On a dedicated server an admin types `bc_export server`. The server's **Hud** setting decides whether its players see the export HUD.

Who can export

Where you play	Can you export?	Locations in the export
single player	yes	all of them
you host the game for friends	yes	all of them
you joined someone's server	while the server's `Allow Export` is on (the default)	only the ones the map shows: the start temple, bosses, traders
a dedicated server	an admin asks it with `bc_export server`	all of them, in the server's own folder

Why a player's export has fewer locations

Every computer builds the land itself, from the world's settings, so the heights, biomes, forests and the rest of a player's export are complete. Only the machine that runs the world knows where every location is. A player's computer knows just the locations the server shows on the map. So an export made on a player's computer holds only those, and its `export.cfg` lets the game place all the other locations in the new world, by its own rules: they end up in other places.

You see, in the export's summary: *... locations in the location map; WARNING: sampled on a client, which knows only the map-icon locations, so the game places the rest.*

Try this: for a complete export of a server's world, ask an admin to run `bc_export server` (below), or ask the server's owner for a copy of the world and export it in single player.

For server owners: Allow Export

In the server's `BetterContinents.cfg`, section `[09 BetterContinents.Export]`:

```
Allow Export = true
```

- **true** (the default): players connected to the server may export its world.
- **false**: they may not. `bc_export` and **Start export** then say *the server does not allow world export (its Allow Export is off)*, and an export a player is running stops.
- The server itself, a host and a single player can always export.
- A change applies at once, also to players who are already connected, on servers that run Better Continents 0.9.0 or later. With an older server, or one without Better Continents, each player's own `Allow Export` decides.

For server owners: the HUD

On a server that runs Better Continents 0.9.0 or later, the server's `Hud` setting replaces each player's own. Set `Hud = true` in the server's config to give your players the status box and the export window; leave it `false` to keep the HUD hidden. Players can still type `bc_export` when the HUD is hidden, while `Allow Export` is on.

For admins: export a dedicated server's world

A dedicated server has no screen, so an admin asks it from the game.

1. **Be an admin of the server**: your ID must be in the server's `adminlist.txt`.
2. **Join the server.**
3. **Press F5 and type `bc_export server`.** Options work as with `bc_export`, for example `bc_export server 4096 nopaint`.

   You see: *Asked the server to export its world (admins only). It writes under its own save folder; its answer and the export's end come back here and go to its log. 'bc_export server status' and 'bc_export server cancel' go the same way.* If you are not an admin, the game answers *You are not admin*.
4. **Wait.** The server exports its world into its own save folder, in `BetterContinents/<world>/export-<date>-<time>/`. Its messages go to the server's log and, since 0.10, to your console too: `bc_export server status` and `bc_export server cancel` answer in both, and the end of the export comes back to you.
5. **Copy the export folder from the server to your computer.** The easiest place is your own save folder's `BetterContinents/<world>/` folder: then `bc_import list` and the Import tab show it.
6. **Make the preset in your game** with `bc_import` (chapter 3). A dedicated server makes no preset itself: it has no New World screen.

> **Good to know:** a dedicated server's save folder is the folder that holds its `worlds_local` folder: by default the same place as a game's for the account that runs the server, or the folder given to the server with `-savedir`. Hosting companies usually show it in their file manager.

Share a world made from an export

A world made from an export is an ordinary Better Continents world.

- Players who join download its settings and maps from the server by themselves; they need Better Continents installed too, the same version as the server (a player with another version is refused). Bigger exports (8192 px, the paint map) mean a longer download on joining. Chapter 9 shows how to make that download faster (the server's **Settings Transfer Rate**) or skip it altogether (a `.bcworld` file you hand out).
- A dedicated server cannot create a Better Continents world itself. Create the world in your game, then copy the world's folder, `worlds_local/<world>/`, into the server's `worlds_local` folder.
- Biome precision (chapter 6) is part of the world: everyone gets it from the world.

8 When it goes wrong

In short: find what you see in the tables below. Most problems come from one of four things: the new world was not made from the export's settings, a picture lost its 16 bits or its hard edges, a map was deleted without the matching setting, or the export was made on a player's computer instead of the server.

The new world is wrong

What you see	Why	What to do
The new world is almost all ocean, or only mountain tops stick out	the heightmap was read with a Heightmap Amount or Sea Level other than the export's (in `export.cfg`, and recorded inside `heightmap.png`: 1 and 0.5 for a default export, 2 and 0.5 for an export of 0.9.x), such as your config's default Amount of 1 against an export at Amount 2. The log has a warning that names both pairs of values. Most often you set only `Directory` to the export folder and chose **From Config**, and a Better Continents older than 0.9.4 ignored `export.cfg`	update to Better Continents 0.9.4 or later, which then uses `export.cfg` (way D, chapter 3), and make another new world; or use way A, B or C. A `heightmap.png` without its `export.cfg` needs the Heightmap Amount and Sea Level Adjustment it was made for in `BetterContinents.cfg` (chapter 4 says how to read them)
The land is far too high, with hardly any sea	the same mix-up the other way round	the same
Mountain tops are flat, as if cut off	the export clipped ground higher than the picture holds: 140 m above the sea at Heightmap Amount 1 (its summary says how many pixels)	export again at Amount 2 (`bc_export amount=2`), which holds 340 m above the sea (chapter 4). Pictures at Amount 2 do not line up with pictures at Amount 1 for cut and paste (chapter 5)
A setting you changed in `BetterContinents.cfg` makes no difference to the new world	`Directory` points at an export folder, and its `export.cfg` lists that setting: since 0.9.4 `export.cfg` wins (ways C and D). The log lists every setting in which the two differ	change the setting in `export.cfg`, or delete `export.cfg` to take every setting from `BetterContinents.cfg`
The world is an ordinary Valheim world, with none of the export	the Better Continents box said **Disabled**, or another preset, when you pressed Done	make another new world, with the export's preset picked
Your edits to the pictures are missing	the world was made from the preset the export made, before you edited	make the preset again with `bc_import` (way B), or use the config way (way C or D)
Slopes you edited have become stairs	the heightmap was saved in 8 bits: by Paint.NET, by Photoshop's Export As, or as a JPEG	save it as a 16-bit grey PNG (chapter 4). If the 16 bits are lost, export again
A thin line of Mistlands (grey) along the coasts	soft or anti-aliased edges in `biomemap.png`: a blend of Meadows and Ocean is nearest to the Mistlands colour	paint the edges again with a hard pencil
Some ground has Ashlands weather or burns, where it should not	faint grey in `heatmap.png`, for example from a soft brush	make the heat map exactly black there

What you see	Why	What to do
No bosses, traders or dungeons, only the start temple	`locationmap.png` was deleted while `Skip Default Locations = true`	set `Skip Default Locations = false` in `export.cfg` and run `bc_import` again (chapter 4)
No alt biomes at all	`altbiomemap.png` was deleted while `Mode = PlantedOnly`	set `Mode = Random` in `export.cfg` and run `bc_import` again
Fewer locations than the old world, in other places	the export was made on a player's computer, which knows only the locations the map shows	export on the machine that runs the world, or ask an admin for `bc_export server` (chapter 7)
A location you drew is missing	its dot touches another dot of its colour; or another location is in the same 64 m square; or its colour is not exactly the one in `locationmap.txt`	keep dots apart (13 pixels at 4096 px) and copy colours exactly (chapter 4)
A boss stands in the sea	its dot is in the sea: the game builds a location where its dot is	move the dot onto dry land of its biome
The ground paint (snow, for example) no longer fits edited mountains	`paintmap.png` still holds the old world's paint	delete `paintmap.png` and run `bc_import` again
You can sail on for ever past the world's edge	the export was made with **Map edge drop-off: off**	export again with *as the world* (the default)
A cliff runs along a pasted piece	the heights of the two worlds met at a hard edge	feather the edge, or smooth the seam (chapter 5)

The export does not start or does not finish

What you see	Why	What to do
World export cannot start: the server does not allow world export (its Allow Export is off)	the server's owner switched exports off	ask the owner, or an admin for `bc_export server` (chapter 7)
… Allow Export is off in this game's Better Continents config	your own `Allow Export` is off, and the server sends no setting of its own	set `Allow Export = true` in your config
… an export is already running	one export at a time	wait, or `bc_export cancel`
… no world is loaded	you are in the main menu	load the world first
World export failed: the world was unloaded during the export	you left the world before the maps were written	stay in the world until *Done*; the partial files were deleted for you
… every map is switched off	nothing is ticked	tick at least one map
The summary says *pixel(s) … clipped*	the world has ground more than 140 m above the sea (at Heightmap Amount 1) or 60 m below it	the clipped peaks come out flat; the deep sea floor does not matter. Export at Amount 2 to keep peaks up to 340 m above the sea (chapter 4); appendix D has the numbers
The game runs out of memory at 8192 px	making the preset takes about 1.8 GB at that size	export at 4096, or untick **New World preset** and run `bc_import` later in the main menu
Locations: the world was still placing its locations … in the notes	the world had not finished placing its locations when the export ran	export again later

The HUD or the keys do nothing

What you see	Why	What to do
No status box, and F7 does nothing	Hud is off: on a server, the **server's** Hud is used (chapter 7)	turn Hud on (chapter 1), or ask the server's owner
Nothing in the main menu	the HUD only shows in a world	use `bc_import` in the console instead
F7 or F9 does nothing, now and then	you were typing somewhere (chat, console, a sign, a map pin, the build menu's search, a number field of the window), or Shift, Ctrl or Alt was held	click an empty part of the window, or close what you typed in, and press the key again
The box and the window vanished	the game's menu is open, or the game's own HUD is hidden (Ctrl+F3)	close the menu, or press Ctrl+F3 again
Another mod reacts to F7 or F9 as well	two mods share a key	change `Window Hotkey` or `Hud Hotkey` (chapter 1)

The preset or the import

What you see	Why	What to do
The export's preset is not in the New World list	it was switched off (**New World preset** unticked, `nopreset`, or a dedicated server), or it could not be made: the export's summary then has a line starting with *WARNING*	look in `BetterContinents/presets/` in the save folder for `<world> <date> <time>.BetterContinents`. If it is not there, run `bc_import` for that export (chapter 3)
bc_import: ... holds no map Better Continents loads	the folder has no picture with one of the names the import looks for	point at the export folder itself, and keep the file names (`heightmap.png`, `biomemap.png`, ...)
bc_import: no folder or export matches ...	a typing error, or the folder is elsewhere	`bc_import list` and a number, or the folder's full path
that export is still being written	the export has not finished	wait for *Done*
this export has no manifest.json, so it did not finish	the game stopped during that export	export again; the import uses what the folder holds
The preset shows the Better Continents logo instead of a map	the folder has neither `heightmap.png` nor `biomemap.png`, which the picture is drawn from	nothing is wrong; the preset works
The config way stopped working after you moved the folder	`From Config` reads the folder from where it was	run `bc_import <new place> config` again, or set `Directory` to the new place (way D, 0.9.4 or later)
Done stays greyed out	the world's name is shorter than 5 characters	type a longer name

World creation seems to hang

What you see	Why	What to do
The progress bar of a new world stands still for a long time	the game is placing locations. A map with a biome left out, or with little room for some locations, makes the game try thousands of spots for each one before it gives up	wait several minutes before you give up. Since Better Continents 0.8.0 a missing biome no longer freezes world creation for ever, as it did before; the log names the missing biomes and the locations the map could not hold

Joining a server takes long

What you see	Why	What to do
A player joining your world waits a minute or more on the loading screen, the first time	the game sends the world's maps at Valheim's own speed, about 150 KB per second	on the server, set `Settings Transfer Rate` (chapter 9), or hand out a `.bcworld` file so players have the maps before they join
`Settings Transfer Rate` changed nothing	it was set on a player's computer: only the server's value counts. Or the connection is crossplay (PlayFab), where the speed cannot be changed: the server's log says *Settings Transfer Rate cannot be raised on this connection*	set it in the server's config; play over Steam
A player who has the `.bcworld` file still downloads the world	the file is for another version of the world's settings (its id differs), or it was never imported: `bc_cache list` on the player's computer does not show its id	export the file again on the server and hand out the new one; on the player's computer, look for *World cache seeded* in the log
... .bcworld: refused (...)	the file is not a Better Continents settings package: cut short in the download, or the wrong file. Better Continents 0.9.x also refuses the file of a version 12 world (the kind 0.10 makes), with *bad header*	download it again; for a version 12 world, use Better Continents 0.10 (a server and its players must run the same version in any case)
bc_cache export: no cached settings for the current world yet	on a player's computer, before the world's maps have arrived; or the world does not use Better Continents	wait until you are in the world, or ask the server's admin for the file

Where to look: the log

Better Continents writes what it does into the game's log, every line starting with `[BetterContinents]`:

- `BepInEx/LogOutput.log`, next to the config folder (in your mod manager's profile, or in the game folder);
- `Player.log` in Valheim's save folder (chapter 2 has the paths).

Useful lines to search for: *World export*, *World import*, *holds a world export* (way D), *was made by a world export for Heightmap Amount* (a heightmap read at other values than it was made for), *The biome map has no*, and Valheim's own *Failed to place all*. For joining (chapter 9): *Settings transfer rate*, *Settings sent*, *World cache seeded* and *bc_cache*.

Getting help

Ask on the Better Continents Discord (discord.gg/3XW8ZntYzN) or open an issue at github.com/RGlabs84/BetterContinents10. Say which version you run, what you did step by step, and what you saw, and attach `LogOutput.log` and the export's `manifest.json`.

9 Give your players the world in advance

In short: when a player joins a Better Continents world, the server sends them the world's maps before the game lets them in. For a big world that takes a while. Two things shorten the wait: the server's **Settings Transfer Rate** setting, and a `.bcworld` file you make once with `bc_cache export` and hand out, so a player has the maps before they join. Both are optional: without them everything still works, only slower.

What happens when a player joins

Every player builds the land on their own computer, from the world's settings and pictures. So when someone joins your world for the first time, Better Continents sends them those settings and pictures before the game lets them in: the same maps an export holds, packed for the network. A 2048 px world is about 12 MB; a 4096 px world with a paint map is several times that.

The player's game keeps what it received, in a cache, so the wait is for the first join only, and again only when the world's Better Continents settings change.

Valheim itself limits how fast anything goes through a Steam connection, to about 150 KB per second, no matter how fast the internet on either side is. At that speed 12 MB takes about a minute and a half, and to the player it looks as if the game has frozen on the loading screen.

Faster: the server's Settings Transfer Rate

Whoever runs the world (the host, or the dedicated server) can raise that limit for the time of the transfer. In the server's `BetterContinents.cfg`, section `[07 BetterContinents.Misc]`:

```
Settings Transfer Rate = KB512
```

Value	What it does
`Vanilla`	leaves the game's own speed, about 150 KB per second
`KB256`, `KB384`, `KB512` (the default), `KB768`	sends at 256, 384, 512 or 768 KB per second
`MB1`, `MB1_5`, `MB3`	sends at 1, 1.5 or 3 MB per second
`Unlimited`	sends at up to 100 MB per second; the transfer itself moves about 4 MB per second at most

- **Steam sends at exactly the speed you set.** It does not slow down for a weak connection, so pick a step that your server's upload and your players' downloads can carry. `Unlimited` is for hosted servers with plenty of both.
- **Only the server's value counts.** A player's own `Settings Transfer Rate` does nothing. This is on purpose: the server decides what it sends.
- The game's own speed comes back as soon as the transfer is done. Nothing else is changed.
- It works on Steam connections only. On a crossplay (PlayFab) connection the game's speed cannot be changed, so the server sends at the game's own speed, and its log says so once.
- The setting is read when a player joins, and Better Continents re-reads the file when it changes, so a new value counts for the next player who joins. No restart is needed.

The server's log says what it did: *Settings transfer rate: 512 KB/s (server setting)* when it starts to send, and *Settings sent: 11840771 bytes in 22.8 s (506 KB/s)* when it has finished.

Measured on a dedicated server on the same computer, with a world of 11.8 MB:

Setting	Time to send the world
`Vanilla`	78 s
`KB512`	23 s
`Unlimited`	3 s

> **Good to know:** on a computer that hosts the game for friends, the setting is in your own `BetterContinents.cfg`, the same file as the export settings of chapter 1. Configuration Manager shows it under *07 BetterContinents.Misc*.

> **Good to know:** a world made with Better Continents' experimental **Compact Maps** setting (`[07 BetterContinents.Misc]`, off by default) saves and sends its maps compressed, so for a world of very large maps the world file and the download are far smaller. Better Continents 0.9 cannot read such a world.

No wait at all: hand out the world in a file

The maps a player would download can be put in a file, once, and given to the players before they join. A player who has the file joins straight away, every time, until the world's Better Continents settings change. The file is a **world cache file**, and its name ends in `.bcworld`.

If you run the world

1. **Load the world**, the usual way: single player, as the host, or on the dedicated server itself.
2. **Open the console and type `bc_cache export`.** In the game, press F5 first. On a dedicated server, type into its window.

   You see: *bc_cache export: wrote ...\BetterContinents\Midgard\Midgard-3a88cb8d....bcworld (11845213 bytes, id 3a88cb8d...).* and *A description for whoever you give it to is in ...\Midgard-3a88cb8d....txt.*
3. **Find the two files** in Valheim's save folder (chapter 2 says where it is), in `BetterContinents/<world>/`, next to your exports: `<world>-<id>.bcworld`, and a `.txt` beside it that says what the file is, for whoever finds it without you.
4. **Give the `.bcworld` file to your players**: on Discord, a file share, or in a mod pack (below). The `.txt` file can go with it.
5. **When you change the world's Better Continents settings** (another heightmap, another sea level, a new alt-biome map, ...), export again. The new file has a new id in its name; the old file is simply no longer used.

> **Try this:** make a mod pack that holds nothing but the `.bcworld` file, for example "MyWorld-WorldCache" on Hexium or Thunderstore. Every player who installs it has the world before they join, with nothing to type: Better Continents looks for `.bcworld` files in every mod's folder when the game starts.

If you are a player

With a mod pack: install it like any other mod, with Gale or r2modman, or by copying it into `BepInEx/plugins`. That is all. Better Continents finds the file the next time the game starts.

With the file itself:

1. **Install Better Continents** the usual way, if you have not yet.
2. **Start the game.** In the main menu press F5 and type `bc_cache import` followed by the file's path, for example:

   ```
   bc_cache import C:\Users\you\Downloads\Midgard-3a88cb8dac50ed221b369c0dcdad2b33.bcworld
   ```

   Spaces in the path need no quotes. A folder works too: every `.bcworld` in it is imported.

   You see: *Midgard-3a88cb8d....bcworld: imported (id 3a88cb8d...)* and *bc_cache import: 1 imported, 0 already present, 0 refused.* If you had the file already, the line says *already present* instead.
3. **Join the world.** The maps are already on your computer, so the loading screen goes straight on.

> **Good to know:** instead of the console, you can drop the file into `BepInEx/config/BetterContinents/seed/` (make the folder if it is not there). Better Continents imports everything it finds there when the game starts. That is the same thing a mod pack does.

How the file is checked

The file's name does not matter: Better Continents works out the world's id from what is in the file, and uses the file only if it is a genuine settings package. A renamed file works; a broken one is refused with one line, and nothing else happens. An import never replaces what you already have. The version of Better Continents counts too: 0.9.x refuses the file of a version 12 world (the kind 0.10 makes) as a bad header.

`bc_cache list` shows what your cache holds: one line per world, with its id, size and date. The cache itself is `BetterContinents/cache/` in the save folder; a `.bc` file there holds the same data as a `.bcworld`.

A player can make the file too

A player who has joined the world once has its maps in their cache. `bc_cache export` on a player's computer, while in that world, writes them as a `.bcworld` file just as the server would: the same file, byte for byte. Useful when the admin is not around.

Appendix A

The console commands

Open the console with F5. Commands and options are not case-sensitive, and a decimal number takes a point: `amount=2.5`.

bc_export

```
bc_export [status | cancel | server <options> | <options>]
  options: [size] [amount=1] [sealevel=0.5] [heatscale=10]
           [edge=auto|on|off] [forest=additive|exact]
           [noheight] [nobiomes] [nolocations] [noforest] [noheat]
           [noaltbiomes] [nolava] [nomoss] [nopaint] [nosources]
           [nopreset] [perpoint]
```

(`bc_export help` prints the same on one line.)

For every player, in a world, without cheats. On a server, a player may export only while the server's `Allow Export` is on; the machine that runs the world always may.

Command	What it does
`bc_export` *options*	starts an export with the defaults of `[09 BetterContinents.Export]`, changed by the options
`bc_export status`	what the export is doing, the folder of the last export, the last error, and why an export cannot start now
`bc_export cancel`	stops the running export and deletes the files it wrote, its preset included
`bc_export help`	the usage line above, and the defaults in use
`bc_export server` *options*	asks a dedicated server to export its own world (admins only). The server writes into its own save folder and answers in its log and to you, the end of the export included
`bc_export server status`, `bc_export server cancel`	the same, on the server

Option	Default	What it means
a number, or `size=`N	`Default Size`, 4096	pixels per side of every picture, 128 to 8192
`amount=`A	`Default Heightmap Amount`, 1	the Heightmap Amount the heights are stored for, above 0 and at most 5. On the game's height scale, where the sea is at 30 m, 1 spans -30 m to 170 m (60 m under the sea to 140 m above it) and 2 spans -30 m to 370 m (up to 340 m above it) (chapter 4)
`sealevel=`S	`Default Sea Level`, 0.5	the Sea Level Adjustment the heights are stored for, 0 to 1
`heatscale=`H	10	the Heatmap Scale the heat is stored for, above 0 and at most 100
`edge=auto`, `edge=on`, `edge=off`	auto	the world's edge. *auto*: as the world has it. *on*: the pictures hold the ground before Better Continents' edge drop-off, which then rebuilds the edge; the world keeps its edge. *off*: the edge is stored as it is and `Map Edge Drop-off` is switched off, which also removes the world's edge: no push back, and the sea goes on for ever
`forest=additive`, `forest=exact`	additive	how the forest is stored: *additive*, black is the game's own forest; *exact*, black is no forest

Option	Default	What it means
`noheight` (or `noheights`, `noheightmap`)		no `heightmap.png`
`nobiomes` (or `nobiome`)		no `biomemap.png`
`nolocations` (or `nolocation`)		no `locationmap.png`
`noforest`		no `forestmap.png`
`noheat`		no `heatmap.png`
`noaltbiomes` (or `noaltbiome`)		no `altbiomemap.png`
`nolava`, `nomoss`		no `lavamap.png`, no `mossmap.png`
`nopaint`, `paint`	with paint	no `paintmap.png`; or with it
`nosources`		no `sources/`
`nopreset`, `preset`	with a preset; none on a dedicated server	no New World preset; or make one
`perpoint`		heights one point at a time instead of the way the game builds terrain; for testing only

What goes wrong is said on the spot: *bc_export: unknown option '...'*, *bc_export: cannot read '...'*, or *World export cannot start: ...* with the reason, for example *the size must be 128 to 8192 pixels (got 100)*.

bc_import

```
bc_import [list | status | help | <number> | <folder> | <world>] [config]
```

For every player, in the main menu and in a world. It reads folders on your own computer and writes your own presets and config, so no server has a say.

Command	What it does
`bc_import`	makes a preset from your newest finished export and selects it: the export of the world you are in; else the last export you made since the game started; else the newest export of the world you played last; else the newest of any world
`bc_import list`	numbers the export folders, newest first, with world, time and size; *(unfinished)* marks an export that did not finish, *(preset made)* one that has its preset
`bc_import` *number*	the export on that line of the list
`bc_import` *world*	that world's newest finished export
`bc_import` *folder*	a full path, or a path under `BetterContinents/` such as `Midgard/export-2026-09-24-14-05-33`. Any folder of Better Continents maps works, with or without `export.cfg`; spaces need no quotes
`bc_import` *export folder name*	for example `export-2026-09-24-14-05-33`
... `config`	added at the end: loads the folder through `BetterContinents.cfg` and selects *From Config*, instead of making a preset
`bc_import status`	what the import is doing, and how the last one went
`bc_import help`	the list above

What an import writes:

- **The preset way:** in `BetterContinents/presets/`, the preset `<name>.BetterContinents`, its 256 px picture `<name>.png`, and `<name>.import.txt`, a note of the folder it was made from. Nothing in your config changes except which preset is selected. A folder without `export.cfg` takes every setting but the folder from your own config.

- **The config way:** `BetterContinents.cfg` gets the world settings of `export.cfg`, `Directory` set to the folder, `Enabled = true` and `SelectedPreset = From Config`. The Export section, `Settings Transfer Rate`, `Map Memory`, `Debug Mode`, `Debug Reset Command`, `NexusID` and `Config Version` are never copied. Your old file is kept beside it as `BetterContinents.cfg.before-import-<time>`.

bc_cache

```
bc_cache [export | import <file or folder> | list | help]
```

For every player, in a world and in the main menu (`import`, `list`). Not a cheat. Chapter 9 explains what the file is for.

Command	What it does
`bc_cache export`	in a world: writes its maps as `<world>-<id>.bcworld`, with a `.txt` note beside it, into `BetterContinents/<world>/` in the save folder. On the machine that runs the world, from the world's own settings; on a player's computer, from the copy in your cache, once it has arrived
`bc_cache import` *file*	puts one `.bcworld` file into your cache. A path with spaces needs no quotes
`bc_cache import` *folder*	every `.bcworld` in that folder and its subfolders
`bc_cache list`	what your cache holds: the id, size and date of every world
`bc_cache help`	the list above, and the seed folder's path

An id you already have is skipped, never replaced, and the id is always worked out from the file's content, never taken from its name. A file that is not a settings package is refused with one line. Better Continents also imports every `.bcworld` it finds under `BepInEx/plugins/` or in `BepInEx/config/BetterContinents/seed/` when the game starts.

bc_twins

```
bc_twins [radius] | remove [radius] | remove confirm [radius] | server <the same> | help
```

For every player, in a world, without cheats. It finds and removes vegetation twins: two copies of one plant on one spot (or within the radius, 1 m by default), which a zone filled with vegetation a second time over its own objects leaves behind. Better Continents keeps new twins out of every world as zones generate; this command is for the ones a world already has. Removal runs where the world is: single player, a host, or a dedicated server through `bc_twins server ...` (admins only; the answer comes back to the admin's console).

Command	What it does
`bc_twins`	counts the twins by plant and zone; a player counts only the area around them, `bc_twins server` the whole world
`bc_twins` *radius*	the same, with a radius from 0.1 to 5 m
`bc_twins remove` [*radius*]	shows what a cleanup would delete and deletes nothing: exact twins only, or near ones too when a radius is given
`bc_twins remove confirm` [*radius*]	deletes the extra copies, 1000 a frame. The copy nearest the ground stays; nothing a player built is ever deleted; crops players grow go only when two stand on one spot. Back up the world first
`bc_twins server` ...	the same on a dedicated server (admins only)
`bc_twins help`	the usage

The bc commands (host, cheats)

bc is Better Continents' command for building worlds. It needs cheats (type devcommands first) and is registered for the machine that runs the world only. With the Server Devcommands mod installed, any player who has cheats on can type it on their own computer, but a change made there reaches only that player's own copy of the settings and their own view of the ground, never the world or the other players, and bc regen refuses. Make bc changes on the host or in single player. bc info on a player's computer shows the settings the server sent.

Command	What it does
bc export run *options*	the same as bc_export *options*
bc export status, bc export cancel	the same as bc_export status, bc_export cancel
bc import run *what* [config]	the same as bc_import *what* [config]
bc import list, bc import status	the same as bc_import list, bc_import status
bc b p [0 to 31]	the Biome precision of the loaded world (chapter 6; an older world (settings version 11) stops at 5); with no number, shows it
bc savepreset [*name*]	saves the loaded world's settings as a preset, with a picture of its map; the name is the world's unless you give one
bc locs	how many of each location the world has
bc bosses	pins the bosses, the start temple and the traders on the map
bc cache ..., bc twins ...	the same as bc_cache and bc_twins
bc regen	regenerates the world's zones now (in a world that uses Better Continents), as every change does: every generated zone is reset and generates again when somebody comes near, except the zones within one zone of something a player built, a tombstone, ground a player has worked (fields, paths, roads), or you inside a dungeon, and the zones another player's game has loaded around them. A location that reaches into more than one zone is kept or regenerated whole. Players, what players built, tombstones and tamed animals are never removed. It rebuilds no ground: nothing has changed
bc reset	redraws the minimap (and reveals all of it), rebuilds the alt-biome grid and the loaded ground, then regenerates the zones, as every change does
bc export, bc import	alone: lists their commands
bc *group* help	lists a group, for example bc b help

Watch out: a change made with bc rebuilds the loaded ground first (the game stalls for a second or two) and then regenerates the zones; bc regen only regenerates the zones. The ground of every zone, the zones that stay included, follows a change: one that lowers the ground under a base leaves its pieces standing in the air, and the game breaks a piece that has lost its support a few seconds later; one that raises it buries them. Make big height changes before you build, or away from what you want to keep.

Appendix B

export.cfg, key by key

`export.cfg` holds the Better Continents settings that rebuild the exported world from the pictures in its folder. It has the same layout as `BetterContinents.cfg`: `[sections]`, and `key = value` lines, each with a `##` comment saying why it has that value. A few keys are only written when their map was exported.

Ways B, C and D of chapter 3 use it: `bc_import` lays it over a copy of your own config to build the preset, and `bc_import ... config` copies it into your config. Since Better Continents 0.9.4, a new world made with **From Config** while `Directory` points at the folder lays it over your config as well, without changing either file (way D); its settings win over `BetterContinents.cfg`. **Every setting it does not list comes from your own** `BetterContinents.cfg`, as it is at that moment. To use a value of your own for a setting it lists, change it here.

The file starts with a short explanation for whoever opens it first:

```
## Better Continents world export of "Midgard" (seed "aB3dE5fG7h"), 2026-09-24 14:05.
##
## WHAT THIS FILE IS: the Better Continents settings that rebuild this world from the maps in
  this folder.
## You do not have to edit it. Three ways to make a new world from the export (README.txt has
  the steps):
##  1. Easiest: in the New World screen, pick the Better Continents preset "Midgard 2026-09-24
  14-05-33" and create the world.
##  2. After editing the PNGs: open the console (F5) and type   bc_import
  Midgard/export-2026-09-24-14-05-33
##     It makes the preset again from the PNGs as they are now, and selects it.
##  3. To keep editing the PNGs: type   bc_import Midgard/export-2026-09-24-14-05-33 config
##     or paste every line of this file at the END of BepInEx/config/BetterContinents.cfg (a
  later line wins) and
##     save it. Better Continents reads the change at once; create the world with the preset
  "From Config".
##     Or set only Directory to this folder: a new world made "From Config" then reads this
  file too, and its
##     settings win over BetterContinents.cfg. The maps are only right with them (Heightmap
  Amount above all).
## Only NEW worlds use these settings. A world that exists keeps the maps it was created with.
```

Its way 3 is chapter 3's ways C and D. In the tables, *old world* means the world that was exported.

[00 BetterContinents.Debug]

Key	Value written	Why	Change it?
`Enabled`	true	Better Continents on for the new world	no
`Directory`	the export folder, with `/` between folder names	loads every map in the folder by its standard name, and no map from anywhere else	no: the import always sets it to the folder it imports, and way D ignores this line and keeps the `Directory` of `BetterContinents.cfg`, so a moved or copied folder still works
`Override version`	empty	the new world gets the settings version its pictures were made for: the newest, or 11 for an export of a world resized under 0.9.x (see below)	no

> **Good to know:** a world made from an export gets the newest *settings version*, 12, when the pictures cover what the world's own size gives, 2 × (`World Size` + `Edge Size`) metres: that is `totalSize` in `manifest.json` (appendix C). Every export of a world of the normal size does, a 0.9.x export included, and so does every export of a version 12 world. An export of a world that was resized under 0.9.x, or made under Expand World Size at another size, covers another span and makes a version 11 world, which gets none of the new behaviour of Better Continents 0.10.
>
> `Override version` is for testing. Set to `11` in your own `BetterContinents.cfg`, it makes a world made with *From Config* (ways C and D) as Better Continents 0.9.4 would have made it. The preset that ways A and B use is built without reading it, but a world made from a preset is saved in it like every other world: while it is set, every world is saved in that version. This line is empty in every `export.cfg`, so way C, which copies the settings of `export.cfg` into your config (pasting the file by hand does the same), sets an `Override version` you had set back to empty. Leave it empty otherwise.

[01 BetterContinents.Global]

Key	Value written	Why	Change it?
`World Size`	the old world's, 10000 normally	the playable radius, in metres. In a version 12 world the pictures span World Size + Edge Size on each side of the middle	no: the pictures are made for it
`Edge Size`	the old world's, 500 normally	the width of the edge ring, in metres	no
`Map Edge Drop-off`	as the old world (true for a vanilla world); false after `edge=off`, true after `edge=on`	whether Better Continents drops the land into the sea at the world's edge	no
`Skip Default Locations`	true when the location map holds every location, else false	true: the game places no locations but the map's	false, to let the game add its own locations around yours
`Sea Level Adjustment`	0.5	the sea level the heights are stored for (only with a heightmap)	never, unless you change every pixel of the heightmap
`Rivers`	false	the old world's rivers are already carved into the heightmap (only with a heightmap)	no
`Mountains Allowed At Center`	true	the old world's middle is already in the heightmap: no second flattening (only with a heightmap)	no

[02 BetterContinents.Heightmap]

Only written when the heightmap was exported.

Key	Value written	Why	Change it?
`Heightmap Amount`	1, or the `amount=` of the export (2, for example)	the amount the heights are stored for; `heightmap.png` records it too	never, unless you change every pixel of the heightmap
`Heightmap Blend`	1	the heightmap is the height, not mixed with generated ground	no
`Heightmap Add`	0	nothing added on top	no
`Heightmap Mask`	0	no masking	no
`Heightmap Override All`	true	every biome takes its height from the heightmap	no
`Heightmap Alpha`	false	`heightmap.png` is plain 16-bit grey	no

[03 BetterContinents.Biomemap]

Key	Value written	Why	Change it?
`Biome precision`	the old world's, 0 to 31	how closely the ground follows the biome map inside each 64 m zone	yes, if you like (chapter 6)

[04 BetterContinents.Forest]

Key	Value written	Why	Change it?
`Forest Scale`	the old world's; 0.5 for a vanilla world	the size of the game's own forest patches, so that its forest pattern lines up with `forestmap.png`	no
`Forest Amount`	0.5 with a forest map; else the old world's	0.5 is neutral: the old world's amount is already in `forestmap.png`	no
`Forestmap Multiply`	0, or 1 after `forest=exact`	0: forest = the game's own + the map; 1: forest = the map × (the game's own + 1)	no
`Forestmap Add`	1	see Forestmap Multiply	no
`Forest Factor Overrides All Trees`	the old world's	as the old world	no

[05 BetterContinents.StartPosition]

Key	Value written	Why
`Override Start Position`	false	the start temple is in the location map

Without a location map, a Better Continents world that fixed its start position keeps it: `Override Start Position = true` with its `Start Position X` and `Start Position Y`.

[06 BetterContinents.Maps]

Only written when the heat map was exported.

Key	Value written	Why	Change it?
`Heatmap Scale`	10	heat = pixel / 65535 × scale; Ashlands wherever it is above 0	no

[07 BetterContinents.Misc]

Key	Value written	Why
`SelectedPreset`	From Config	selects *From Config* when you paste the file into your config by hand. The import and way D ignore it: `bc_import` selects the preset it made, `bc_import ... config` selects *From Config* itself, and with way D you pick *From Config* yourself

[08 BetterContinents.AltBiomes]

Only written when the alt-biome map was exported.

Key	Value written	Why	Change it?
`Mode`	PlantedOnly	the alt-biome map holds every alt biome as the game placed it, so the game adds none at random	Random, to let the game add alt biomes to the regions left black
`Grid`	the old world's	where alt biomes stop at the world's edge	no

What the import never takes from export.cfg

The Export section (`[09 BetterContinents.Export]`), `Settings Transfer Rate` and `Map Memory` (settings of the machine), `Debug Mode`, `Debug Reset Command`, `NexusID` and `Config Version` are not world settings, so the import skips them and says so. Lines it cannot read, and names Better Continents 0.10.x does not know, are skipped and reported the same way: *World import: ignored …*. Way D skips the same lines, and the log lists them as *export.cfg: ignored …*.

Appendix C

manifest.json, field by field

`manifest.json` is written last, so a folder that has one holds a finished export. It is plain JSON, for tools and for checking that two exports line up (chapter 5). A field is `null` when its map was not exported.

The first lines of a manifest look like this:

```
{
  "format": "bc-export/1",
  "modVersion": "0.10.x",
  "gameVersion": "l-1.0.x",
  "exportedAt": "2026-09-24T14:05:33",
  "seconds": 184.2,
  "worldName": "Midgard",
  "seedName": "aB3dE5fG7h",
  ...
```

The export

Field	Example	What it is
`format`	`"bc-export/1"`	the layout of the export; it changes only if the way pictures are stored changes
`modVersion`	`"0.10.x"`	the Better Continents version that exported
`gameVersion`	`"l-1.0.x"`	Valheim's version text
`exportedAt`	`"2026-09-24T14:05:33"`	when the export started
`seconds`	`184.2`	how long it took
`worldName`, `seedName`, `seed`	`"Midgard"`, `"aB3dE5fG7h"`, a number	the old world, its seed as typed, and the seed as a number
`betterContinentsWorld`	`false`	whether the old world was a Better Continents world
`sampledOn`	`"host"`	`"host"`, `"client"` (a player on a server: incomplete locations) or `"dedicated server"`

Size and place

Field	Example	What it is
`size`	`4096`	pixels per side of every picture
`totalSize`	`21000`	metres the pictures cover per side: 2 × (World Size + Edge Size) for a version 12 world; 21000 for an older world (settings version 11), whatever its World Size said; with Expand World Size installed, the size that mod gives the world, for either
`worldRadius`, `totalRadius`	`10000`, `10500`	the playable radius, and the radius to the outside of the edge ring
`metresPerPixel`	`5.1282053`	totalSize / (size − 1)
`pixelToWorld`	text	the pixel-to-world formula, as in appendix D

Heights

Field	Example	What it is
`heightmapAmount`, `seaLevel`	`1`, `0.5`	what the heights are stored for (1 unless the export was made with `amount=`); `heightmap.png` records them too
`seaLevelAdjustment`	`0`	1 − 2 × seaLevel
`heightEncoding`	text	the height formula, as in appendix D
`waterlineValue`	`0.3`	the value at the sea's surface (`0.15` at Amount 2)
`floorMetres`, `ceilingMetres`	`-30`, `170`	the heights of black and white, counted the game's way (the sea is at 30 m); `370` at Amount 2
`clippedLow`, `clippedHigh`	`0`, `18452`	pixels inside the world that were lower than black or higher than white
`edgeRingClipped`	`0`	the same for the edge ring, where the land falls away anyway
`heightRangeMetres`	`[-24.3, 318.9]`	the lowest and highest ground inside the world
`zoneBlend`	`true`	heights sampled the way the game builds its terrain
`edgeDropoff`	`true`	whether the new world keeps Better Continents' drop-off at the world's edge

The other maps

Field	What it holds
`forest`	`encoding` (`"additive"` or `"exact"`), `multiply`, `add`, `forestScale`, and `clippedLow`, `clippedHigh`: pixels whose forest the encoding could not hold
`heat`	`scale` (10), `ashlandsPixels` (pixels above black), `clipped` (pixels hotter than the scale)
`altBiomes`	`classes` (colours), `regions`, `forcedClasses` (colours with a forced `!` name), `droppedRegions` (regions past the limit of colours, left out)
`locations`	`complete` (every location of the world is in the map), `instances`, `types`, `written`, `nudged` (moved a pixel or two to keep apart from a neighbour), `dropped`, `outsideMap`, and the location map's own `pixelToWorld` formula
`biomePixels`	how many pixels each biome has, such as `"Meadows": 1520441`

The preset, the files and the notes

Field	Example	What it is
`preset`	an object	`name`, `file` (the preset's path), `made` (true or false), `error` (why not, or null), `howToUse`
`import`	`"bc_import Midgard/export-2026-09-24-14-05-33"`	the console line that makes the preset again
`files`	a list	every file the export wrote, `manifest.json` included
`notes`	a list	the same notes as `README.txt`'s *NOTES ON THIS EXPORT*

Appendix D

The formulas, for the curious

Nobody needs these to export, edit and import. They are here for tools, scripts, and the curious. `size` is the pictures' size in pixels, `totalSize` is 21000 m in a normal world (2 × (World Size + Edge Size)), and a 16-bit pixel p stands for the value v = p / 65535.

Pixel and world

Column c counts from the left (west), row r from the top (north); x grows to the east and z to the north.

```
x = ( c / (size - 1) - 0.5 ) * totalSize
z = ( 0.5 - r / (size - 1) ) * totalSize

c = round( (x / totalSize + 0.5) * (size - 1) )
r = size - 1 - round( (z / totalSize + 0.5) * (size - 1) )
```

Better Continents reads every map smoothly between these points (a biome takes the one most of the 4 nearest pixels have). Only the location map counts differently, as Better Continents' location loader does, so its dots can sit up to a pixel off the other maps:

```
x = ( c / size - 0.5 ) * totalSize
z = ( 0.5 - (r + 1) / size ) * totalSize
```

Heights

```
world height (m) = ( v * amount - 0.15 + adjustment ) * 200
adjustment       = 1 - 2 * seaLevel              (0 at Sea Level 0.5)
v                = ( metres / 200 + 0.15 - adjustment ) / amount
the sea          = 30 m world height, so height above the sea = world height - 30
```

At Heightmap Amount 1 (the default) and Sea Level 0.5 this is:

```
world height = 200 * v - 30        black -30 m, white 170 m
above sea    = 200 * v - 60        waterline v = 0.30
one 16-bit step = 200 / 65535 = 3 mm      one 8-bit step = 200 / 255 = 0.8 m
```

At Heightmap Amount 2 and Sea Level 0.5 (`bc_export amount=2`) it is:

```
world height = 400 * v - 30        black -30 m, white 370 m
above sea    = 400 * v - 60        waterline v = 0.15
one 16-bit step = 400 / 65535 = 6 mm      one 8-bit step = 400 / 255 = 1.6 m
```

In general the waterline is v = (0.30 − adjustment) / amount, black is (adjustment − 0.15) × 200 m and white is (amount − 0.15 + adjustment) × 200 m of world height. A bigger amount raises white, and a higher sea level lowers black: for example `bc_export amount=3` stores −30 m to 570 m with the waterline at 0.1. Such an export lines up only with exports and maps made for amount 3 (chapter 5), and the sea still sits at 30 m.

An export also writes `amount` and `seaLevel` (the config value, 0 to 1, not the adjustment) inside `heightmap.png`, as a PNG text chunk with the keyword `BetterContinents` and the text `Heightmap Amount = 1; Sea Level Adjustment = 0.5`. Image editors show it and often keep it. Better Continents reads it back, and a new world that reads the heightmap at other values writes a warning to the log.

The heights are sampled the way the game builds its terrain: every 64 m zone blends the height formulas of the biomes at its four corners, with a smooth curve across the zone. Past World Size, Better Continents' edge drop-off pulls the ground down into the sea; with the drop-off on, the heightmap holds the ground before the drop-off, and Better Continents applies it again when it builds the new world.

Heat

```
heat = v * Heatmap Scale                    (10 by default: white is 10)
Ashlands wherever heat > 0
```

The export stores the game's Ashlands ocean gradient g as v = g / scale; Better Continents reads back scale × v − 0.00001.

Forest

The game's forest factor runs from about 1.85 (bare) to about 0.15 (densest). Call n the same thing turned into 0 (bare) to 1 (densest): n = InverseLerp(1.850145, 0.145071, factor).

```
additive (Forestmap Multiply 0, Add 1):
    stored   f = n(wanted) - n(game)
    forest     = n(game) + f
exact (Forestmap Multiply 1, Add 1):
    stored   f = n(wanted) / (n(game) + 1)
    forest     = f * (n(game) + 1)
```

A stored value below 0 cannot be kept, so the additive form cannot make a place barer than the game's own forest; the exact form can.

Lava, moss and paint

`lavamap.png` and `mossmap.png` are 8-bit: the transparency channel of the game's ground paint in the Ashlands and the Mistlands, which the game itself keeps in 8 bits, so nothing is lost. Lava wherever the lava map is above 60 %. `paintmap.png` holds the red, green and blue channels of the ground paint, 8 bits each.

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```
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