

Virtual Landscapes

A PRACTICE-BASED EXPLORATION OF NATURAL
ENVIRONMENT DESIGN IN
COMPUTER & VIDEO GAMES

VOL.II of II

APPENDICES

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A thesis submitted in partial fulfilment of the requirements for the degree of.

Doctor of Philosophy

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Appendix A: Umran Ali CV

Details of Higher Education

Degrees, Diplomas & Postgraduate qualifications	Dates	Awarded by
BSc Computer & Video Games (1st Class)	2001-2004	University of Salford
M.A Creative Technology (Distinction)	2004-2005	University of Salford
Postgraduate Certificate in Higher Education Research & Practice (Distinction)	2007-2008	University of Salford
Ph.D (ongoing)	2008-2015*	University of Salford
Professional Qualifications	Dates	Awarded by
Fellowships of Higher Education Academy	2008	Higher Education Academy

Employment Experience

Summary of employment, commencing with the present or most recent		
Date From/To	Employer	Position held, brief description of duties and reason for leaving
March 2013-Present	University Of Salford	Senior Lecturer in Creative Media
Aug 2011-March 2013	University Of Salford	Director Of Creative Media
July 2009-August 2011	University Of Salford	Senior Lecturer in Creative Media
July 2006-July 2009	University Of Salford	Lecturer in Multimedia
Sept 2004-July 2006	University Of Salford	Visiting Lecturer in Art & Media
Sept 1998-2001	Freelance 3D Artist & Designer (Self-employed)	Freelance 3D Artist & Designer <ul style="list-style-type: none"> • Pir8 Media (logo branding) • 3D Artist (EternalKnight Game)

Publications and Research

<p>Publications</p> <p>Ali, U. (2012). <i>Virtual Landscapes: The Embryonic Era (1980-1989)</i>. ISBN(978-0-9574086-0-9, Zayn Creative</p> <p>Ali, U. (2012). <i>Virtual Landscapes: The Transition Era (1990-1999)</i>. ISBN 978-0-9574086-1-6, Zayn Creative</p> <p>Ali, U. (2012). <i>Virtual Landscapes: The Modern Era (2000-2012)</i>. ISBN 978-0-9574086-2-3, Zayn Creative</p> <p>Projects (Practice-Research)</p> <p>Beyond Aesthetic Reference: An interactive natural landforms reference tool (2014)</p> <p>ShadowMoss Memory: a Stereoscopic short 3D film made in CryEngine 3 (2014)</p>
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MindFlow: A Collaborative creative project tool (2013)

ShadowMoss Island; A Practice based exploration of Virtual Landscape Design, in CryEngine 3 (2012)

Virtual Landscapes Interactive Database: An interactive database of the landscapes in over 100 games across 30 years in UltraHD panoramic form (Microsoft PivotViewer)

Virtual Jean-Claude Risset: 2003 and 2004, Marseille, Paris/ F and Manchester/ UK, Fuchs, Ali & Ward (3D Artist & Character Animator)

Virtually FACTicious (2004) Ali, Fuchs, Eckermann with Darkhorse Venture and BT Exact

Heretic Kingdoms: The Inquisition (2004), 3D People, Project Three Interactive BV, PC Game(DesignCredit)

PlastiCity: 2004 - 2006, Bradford and Manchester/ UK , Fuchs, Ali & Ward (3D Artist, Character Animator)

Conferences

Ruskin, Geology and Mountains: The Future of Game Design, UoS Pecha Kucha (2013)

Serious Games: Games Design & Landscape Architecture Ludotopia II Conference and Workshop Series, 2011

Games Design & Virtual Landscapes A&D Research forum, UoS, (2010, 2011, 2012)

Anti-Piracy Countermeasures, IGDA, GDCE 2003

Exhibitions

Virtual Landscapes (2014)

AnimGame Festival MCUK, June 2012

Virtual Landscapes @ BBC Fusion (2012)

External Work

B.A Media, , Hong Kong Design Institute & University of Coventry, External Advisor ,2016

B.Sc Interactive Entertainment (Games Development), B.A Interactive Entertainment(Digital Art), External Examiner Birmingham City University, 2014-2015

B.Sc Interactive Entertainment (Games Development), B.A Interactive Entertainment(Digital Art), External Validator, Birmingham City University, 2014

FdD Interactive Media, Northern Region College, Ireland, External Advisor (2014)

Edexcel/Pearson ; A-Level Design & Technology/Product Design Specifications Redevelopment Consultant (2012)

Edexcel/Pearson ; A-Level Art & Design Specifications Redevelopment Consultant (2012)

Salford City College Games Design (Foundation Degree) External Advisor (2012)

Manchester College, BTEC Media Production(Games Development) External Verifier(2012)

Appendix B: Lorien Design Document



Lorien: The New Shadow

A Quake 3 Arena Map

A write up submitted for the subject of CVG Design Assessment Level 1 in:
The full design document can be found in DVD 2

Part 5: Thematic design

We can now create simple 2D drawings, which should provide us with our base concept, from which to work from. Either hand drawn or Photoshop/Image Editor will suffice (However hand drawn maps are better since they allow for better innovation and faster editing!). We should create more than 1 map, and choose the best.

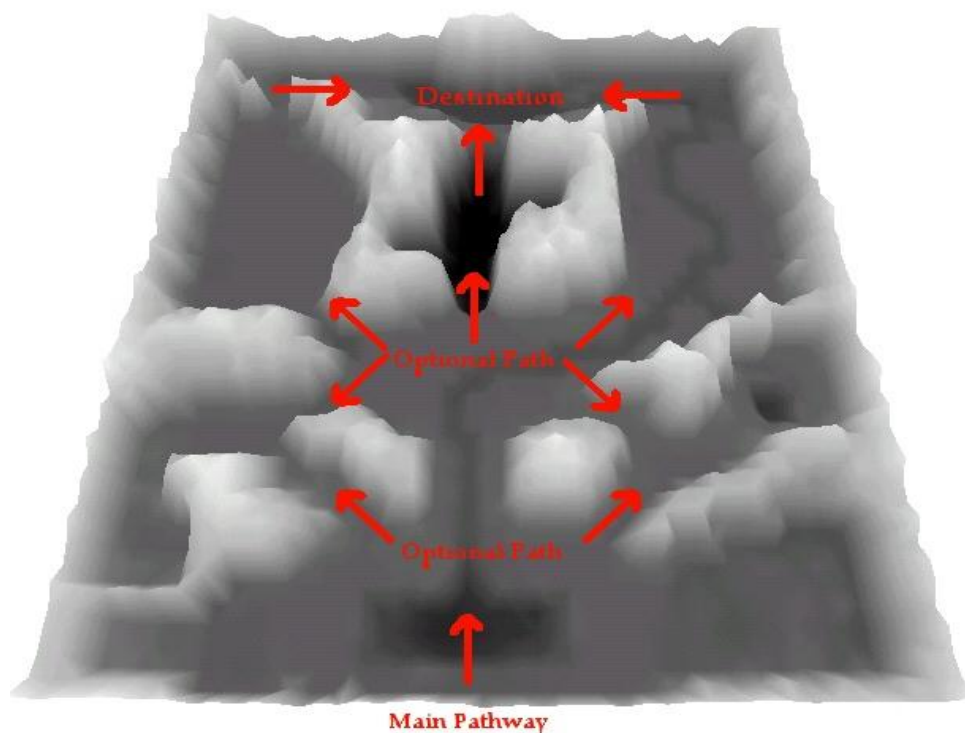
From the map we can see that regions, have been placed so as to support the player in providing a mental image of a map. Allowing the player to become familiar how areas interconnect with each other, allows:

1. The player to form a mental image in his head, of his relative location in the map and his relational distance to game objects (weapons, health etc.)
2. Less confusion and ambiguity when the player is respawned after death. I.e. he knows where to run to immediately and equip himself with a weapon, so as to join the melee as soon as possible.
3. Greater appeal of any story that the level takes place in. i.e. knowing for instance that a character in the story chose a certain path, the player may decide to follow, and investigate for himself.

Next we will look at how the map integrates the concept of good thematic design, and gameflow, in terms of path choices.



Gameflow Chart



In game Weapons/Models/Sound Conceptualisation

Weapon 1: Druid Staff: A wooden staff (~6ft) made of old gnarly oak, long and thin with a carved staff head. Fires powerful green plasma energy

Weapons 2: Serpent Cane: A bronze cane (~ 4ft) made of a central cane with a coiled serpent wrapped around, with the head forming the end point on the top. Fires red broad range snake darts, causing poison/damage until health/cure is collected.

Weapon 3: Necromancer Sceptre: A large thin, white sceptre, carved out of white marble shaped like a thin forearm and hand, with golden relief patterns running up the sceptre, leading up to a golden hand grasping a blue orb, pulsating gently. Fires a slow heavy ball of electrical discharged energy.

Weapon 4 Demon Rod: A small rod (~3 ft), made of a dark, metallic like substance, jet black with a slight red sheen, shaped like a 3ft leg bone, with a carved gargoyle head, with the open mouth forming the weapon's head. Fires a continuous stream of red/black flames, causing major damage at short range and absorbing strength from the victim to the user.

Model 1: A Large cliff face, made up of broken faces and small caves, brown rocky texture, with reeds, small grasses, lichens, mosses growing sparsely in and around where the waterfall force is at it's minimal

Model 2: A tree canopy covering the dark woods, thick dark green coverage, with little break-up allowing little pockets of sunlight to stream through exposing the decaying detritus of the forest floor.

Model 3: Large central pillars made of smooth dark marble, which stand in an arc in the central portion the map.

Model 4: Large ropey bridge made up of old decaying wood and worn rope, broken in places.

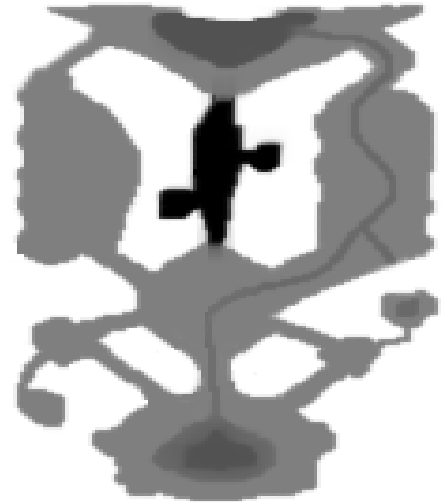
Models 5a-5x: Underground Mine structures, Pillars, crypts, covered in dark, black speckled dust, spider webs, broken in places, ancient and old.

Part 6: Technical Architecture: "Preparation of the technical design detailing the tools and technologies that will be needed"¹ for the development process.

Art & Graphics: Adobe Photoshop, 3D Studio Max R3 (inc md3 exporter), Terragen

Sound & Music: Digital Recorder, Cool Edit 2001 pro, CakeWalk Sonar, Steinberg Cubase VST 5.1

Level Design: Easygen, GTK radiant 1.1 TA



Now the initial, conceptualisation stage is complete, we begin the development stage.

Stage 2: Development

The development process can be broken down into different tasks to be completed by each department.

(A&G) indicates take to be completed by Art & Graphics department

(S&M) indicates take to be completed by Sound & Music department

(LD) indicates take to be completed by Level Design department

(EXT) Indicates Possible Extension In the future

1. From the thematic design map-outline, create a height map (256 shades of grey that each represent a change in height, i.e. black=lowest, white=highest, grey (128)=midway) (A&G)
2. From this Alpha/height map (known as both those names) use EasyGen terrain generator to create the terrain entity mesh, divisions should be around 20-50 MAX (more =higher poly count) (LD)

¹ <http://www.music.salford.ac.uk/music2/web/localaccess/cvg/design/design1-timeline.htm>

Appendix C: THE Research Article

Academic turns to Ruskin to make virtual landscapes that feel real

Games designers should try countryside rambles, Salford scholar suggests. Matthew Reisz reports

A University of Salford academic wants to encourage digital designers to return to the great English tradition of landscape writing from Wordsworth to Ruskin.

Umran Ali, senior lecturer in creative media, worked in the games industry before joining Salford as programme leader on its BSc in computer and video games. He is still involved in freelance projects, such as one that hopes to visualise “the regeneration of Bradford city centre in a fully interactive form”.

A keen walker and climber, he has long been interested in finding ways to “link back digital landscapes to real environments” and the feelings they evoke in him.

Yet today’s games industry, Mr Ali argued, is “still in the black and white era, with companies doing

their own thing” without any underpinning philosophy for their design work.

It was while reflecting on such issues for his soon-to-be-completed PhD that Mr Ali came across the writings of the Victorian critic John Ruskin and his dictum that artists should “go to nature in all singleness of heart, and walk with her laboriously and trustingly”.

Ruskin, he said, had “a passion for geology and natural sciences” and was quite capable of “studying a rock formation for a week to do one pencil sketch. It is not good enough to draw from memory. You have to look at nature and find your creativity there.”

Such ideas once inspired landscape painters and so could inspire games designers today, he said. Yet although “augmented reality” tech-

niques now mean that “virtual spaces can have all the power of real spaces”, Mr Ali believed that too many in the gaming industry still fall back on what he calls “golf course design”.

To take the debate forward, he has produced *Virtual Landscapes*, a series of three books on video games exploring everything from “the giant mushroom forests of *Morrowind*” to “the tropical underground caves of *Phantasy Star Online*”.

After a trip to Snowdonia, “reflecting and trying to relive what Ruskin recommended”, Mr Ali drew on his experiences to create an experimental game and a design methodology that he hopes could be useful for both indie designers

and the mainstream games industry. He has organised field trips as part of his teaching and aims to embed them more formally into his courses.

If virtual landscapes are to make the kind of emotional impact that landscapes in film often do, he said, their creators should listen to Ruskin’s edicts and “get out into the real landscape. You won’t be able to take full advantage of the technology we now have by just sitting in your bedroom.”

Games designers would also be well advised to look again at the rich treasury of English nature writing that emerged from the late 18th century, which Mr Ali calls “a great heritage which should be referenced by games designers”.

matthew.reisz@tesglobal.com



Appendix D: Virtual Landscapes

Permission has been granted to use the following names and comments in this report
Review from Mark Jackson, Landscape Architect (2012, via email)

“Hi Umran,

My name is Mark Jackson and I am a Landscape Architect practicing in Adelaide, South Australia. I am currently writing an article on the crossover between digital and physical play, and your Virtual Landscapes series of books have been an invaluable read. What a colossal piece of work it must have been. I will no doubt make reference to it as a gauge of how much the games industry has progressed in its portrayal of the landscape.

Landscapes within games has been a relatively unheralded medium of interpretation that I feel has lacked wider recognition within the field of Landscape Architecture. I’m especially interested in the digital landscapes role as a key source of exposure to landscapes amongst younger generations of gamers. This is a particularly interesting interpretation for those individuals who lack access to or experience of real landscapes, but whom have been exposed to a diet of realistically rendered landscapes within games.

I feel the accessibility of games in exploring virtual environments and the ability for gamers to shape elements of those environment as an empowering tool that hasn’t really been utilized to its full extent. It’s no surprise that higher budget and civil projects are now affording the use of game engines to create their designs. The potential for interaction and the ability to record how people respond to certain landscapes and configurations would be an ultimate consultation tool.

Whilst the savviest of landscape architects have mastered 3D rendering software, the technical constraints of portraying the landscape in comparison to architectural elements for example, has hampered the adoption of such software. Interactive 3D software seems like miles away but the foresight of its benefits are clear to me. What has your experience of this kind of software/hardware been so far in academia or otherwise?

Elsewhere in the peripherals of the landscape industry I have come to notice basic elements of digital gaming starting to enter the suite of conventional playground equipment. I see the future of digital gaming playing a much greater role in outdoor play, even though at the moment games are largely domesticated. The advent mobile gaming devices is still running its course but I’m yet to be convinced on its effective use. I wonder how long it will be until we see the mainstream return of headsets in gaming, which might then harbor the ability to augment reality and capitalise on the outdoor environment with greater effect?

It would be great to build up some dialogue relating to the possible future development and crossover of digital play into the outdoor environment. I am not sure what the current focus of your work is at the University of Salford, but it is your reflection on landscape architecture and environmental psychology in your previous work that has my attention.

I am back over in Manchester in mid-December for a month so it would be interesting to catch up and discuss further.”

Review from J. Femia (2015, Via Virtual Landscape Website)

“Very interesting work with a lot of detail in all three of the documented eras. They illustrate a very important journey of evolution in computer graphics. It highlights to me the large amount of thought and work that is put into virtual landscapes within video games, perhaps more so in the earlier eras when the level of technology was such a limiting factor. It is especially relevant now that technology is advancing to such a level that virtual environments will soon be able to be presented almost photo-realistically and immersively.”

Review from Shaheena (2015, Via Virtual Landscape Website)

“The virtual landscapes are wonderfully vivid, I can almost picture myself there. You have a true talent for photography.”

Review from Lightning (2015, Via Virtual Landscape Website)

“I’ve just finished reading through the 3 books and they’re extremely detailed exploring the history of landscapes in videogames with visuals to reflect on the evolution of the virtual environments through time and how something as little as block colours could still translate on screen to viewers as an environment with basic features such as trees, whereas currently, technology has allowed the representation of virtual landscapes to be much more powerful and realistic. Great work and inspirational story of the great wall.”

Review from Toby Rushton (2015, Via Virtual Landscape Website)

“Content itself though is great, I think the panoramas in general hold a great deal of analytical potential for someone such as I who find that, while basic screenshots can give a decent overview of an artists vision, they are very limited to the dimensions of the screen. In fact I had a conversation with a friend recently on the arguments of wide vs narrow FOV in games, where one might argue that a narrow FOV improves focus on target and makes you play better, but a wide FOV trades that off with an ability to appreciate the surroundings a bit more and gives more immersion. The panoramas are almost like a support to those arguments because it’s like viewing a different world to ones we normally see when we play. This is especially apparent with more whimsical NVEs like in Windwaker, since we see a lot more of the fantasy elements on screen than we normally would and we get to see how well they gel together.

I do also like the photographic research elements. The Blue Lagoon was an interesting read and a great insight to the human psyche. I think it’s very good to look outside the box and really dig in deep why people are drawn to these environments. Anybody reading might then take a further look into what makes each element of a landscape tick and by extension, have them have a look at their own work, particularly if they are an environment artist themselves. It would be great to see even more of that!

May I suggest though, if you’re continuing research, that you take a look at some recently made NVE’s created in the Unreal 4 engine now that it’s starting to churn out some already impressive looking titles. ARK: Survival Evolved would be a perfect addition to the Modern Era section because it’s a great example over how people like to play in those environments despite a significant portion having to grit their teeth through 15-30fps. Would gamers be as forgiving if the environment was urban, or futuristic? I believe some people are renewing old game environments in the engine as a comparison as well. You likely may have already seen it as an example, but there’s a video of Kakariko village from Zelda. It might just be extra avenues of research to explore, particularly how much technology influences the environment.”

Review from Lubna (2015, Via Virtual Landscape Website)

“What a great piece of work and an introduction to the virtual world. Looking at the images of Jacobs Well just gave me goose bumps. Fantastic imagery and the use of colours to bring the landscapes to life –felt like I have just been taken on a journey of some of the wonders of the world that I didn’t know existed. It is admirable how these images have been captured into virtual landscapes, thank you.”

Review from Ste Marshall (2015, via email)

“This is a wonderful array of research! As a hobbyist concept artist, I can see clearly the mission undertaken to highlight the connection between real world eco systems and those seen in game environments. It’s not just about making sure forests are lush and green and water is blue and sparkly, it’s about making something fit for purpose and believable. The natural flow of sediment, the arching of trees towards the North, weather systems that work in tandem with lighting and tones to create mood, are all influenced by what we see in our own world and beyond. I say this because I share the views made in Virtual Landscapes! I think if nothing else the body of work helps to convey the sheer depths of research and development that intrinsically informs the beautiful landscapes we see in games today. This is something that we can revere, and will continue to develop until the divide between what is real and what is virtual becomes ever less visible.”

Review/Request from Stephan Sabatier (2013, Via email)

“Hi Mister Umran,

I want to use a piece of your virtual landscape to illustrate the cover of a book in France. I ask your permission to do so. You will find enclosed the illustration in which the landscape is used. This is the story of surviving a crash that ends up having to survive in a prehistoric jungle. let me point out that it is not about selling this illustration. Thank you for your answer, forgive me my broken English !”

Review from N. Sharif (2015, Via email)

“Dear Sir, I was very impressed by the trip through memory lane and your depth of knowledge of each game. The transition is incredible and underlines the impact of technology but also the detail and effort of those coding these games. The visual effects are nothing short of stunning and breath-taking. It is hard to imagine what the next level could be and whether virtual reality will be everything we hope it to be. Your depiction and history illustrate how far we have travelled and give us hope for an even brighter future bathed in glorious colour.”

Review/Request from Nikolaos-Modestos Kougioulis (2015, Via email)

“Mr Umran Ali,

First of all, let me express my enjoyment for discovering your e-mail address and getting the ability to send you this message. I'm an undergraduate student of Mathematics at Aristotle University of Thessaloniki, with a keen interest to Artificial Intelligence and Virtual Worlds. At my spare time, apart from my studies, I do some research on the above fields.

I managed to make a panoramic image viewer in OpenGL, which uses as input a panorama image, then creates a hypothetical sphere and treats the image as a texture on the sphere, thus creating a 360 degree image and the illusion of a virtual world. This method, equirectangular projection, has been used in early games of the century, like Myst, to serve as a transaction from 2D environments to 3D worlds.

To make things short, after using various high quality panoramic photographs, I decided to try using panoramas from virtual landscapes and environments, to recreate the atmosphere Myst and similar games created. I stumbled upon your virtual landscapes, with panoramas from the Elder Scrolls series etc. I tested your images on my humble program with great results!

To my excitement, I may write a paper on panoramic virtual worlds, generating from virtual (or real) landscapes, and what the possibilities and benefits may appear, but definitely not in the time being, being an undergraduate student! As a result, I would like to ask for your permission to use your images, as published on minus.com, in case I decide to write that paper.

I would love to share the results of re-creating 3D worlds using your virtual landscapes on my little program, and who knows, maybe in the future my work path will meet your path!”

Review by Zubysan (2012, Via Apple Reviews)

Fantastic insight into landscapes ★★★★★

The thought and insight gone into these books is totally awesome. They give you a real insight into virtual landscapes and the considerations that must be adopted to create your own. Superb!

Review by Violet (2012, Via Apple Reviews)

Fantastic read ★★★★★

The three book series is truly exceptional. There is nothing like it out there. A non gamer myself, I still found the three parts kept my interest and my imagination challenged. These virtual landscapes are stunning: creating a gaming environment which is so real that you can escape without even knowing. It shows the gaming world from the start to the present and there is so much potential for it grow: engaging with every age group and interest. Well done

Review by Warren Mascot (2015, Via Virtual Landscape Website)

“A great way to investigate the environments of video games!”

Review by Shazia Ahmed (2015, Via Virtual Landscape Website)

“An amazing piece of work that brings the landscapes to life. The detail is mind-blowing. You can actually imagine being in it”

Review by Asim C (2015, Via Virtual Landscape Website)

“A great piece of work that brings this area to life in a very accessible format. Look forward to subsequent works from this author. “

Review by Yasmeen (2015, Via Virtual Landscape Website)

“It is amazing to see how much technology has improved from the pixilated images to the digitally enhanced high definition panoramic landscapes!!”

Review by Lewis Markey (2015, Via Virtual Landscape Website)

“A great series. There's a lot of depth and knowledge here, it's a breath of fresh air to see how we've progressed within this 3 part series. A great read with potential for more when we go up another stage. “

Review by Jack Healey (2015, Via Virtual Landscape Website)

"This 3 part series gives fantastic insight into the evolution of video game landscapes, clearly a lot of research and development has gone into this, with brilliant panorama images reinforcing every point made. The choice to demonstrate the evolution of different series was particularly fascinating, seeing the landscapes of King's Quest & The Elder Scrolls change over time as technology evolved was great, especially with the fantastic panoramas of each game excellently displayed. It's very clear a lot of thought has gone into the design here. Overall a great variety of virtual landscapes researched with solid breakdowns & imagery displayed excellently to help the reader to take it all in. An insightful read to anyone interested in virtual landscapes or video games in general.

The only thing I would love to see added is a breakdown of Rockstar's Red Dead Redemption (2010) as it is one of the highest rated games ever made & one that has won numerous awards for its western environment & world design. Also in some cases going with a very dark grey background over a solid black can help your darker images & shadows pop off the page more, but this is purely personal preference & may not necessarily be true in this case."

Review by Zubay Ahmed (2015, Via Virtual Landscape Website)

"A superbly tackled piece of work, from both an industry and academic perspective. The work here provides excellent research-based insight, demonstrating real in-depth critical analysis on the development of virtual environments. With the advent of upcoming VR tech (Oculus, Morpheus, Rift), this is a must read for anyone delving into the realms of virtual landscaping!"

Review by HalaSadik (2015, Via Virtual Landscape Website)

"Very interesting and fascinating tour of gaming background"

Review by Warren B. (2015, Via Virtual Landscape Website)

"The three part series is brilliant! It gives an insight into how environments felt in the history of video games. You can really feel how players navigated and to see the evolution of how players are able to move in video worlds. This collection would be so useful to anyone completing academic research or dissertations on virtual environments of any kind!"

Review by (Exhibition) @ MediaCity UK 2012

Review by John Joseph Benjamin (Creative Content Administrator, 02/02/16, Via Email)

Some time ago Umran provided me with a rare chance to view his wonderful 360° landscape renders captured in game engine. I feel the images he produced really captured and brought to the foreground the aesthetics and realism these games worlds have, more so than during the campaign which is somewhat hindered by the usual distractions of the game the H.U.D and gameplay.

Capturing the bare-bones quality and well-conceived landscapes contained in these games, Umran was able to focus the viewer's attention on the wonderful geology of these rolling landscapes aiding the ambiance and perpetuating the desire for exploration. The intricacies and lustre of the Skyrim landscape, for example, were put under the microscope and bombarded my senses with greater effect than under the gameplay paradigm itself, enabling me to re-live the sense of wonder conveyed by these beautiful game worlds all over again but in a new, more contextual light.

Warren Mascot (13 October 2015 , via Google Play reviews)

***** (5 Star) A great way to investigate the environments of video games!

Karen Watts (22 December 2013 , via Google Play reviews)

***** (5 Star) Pictures are Amazing Always Remember "No Worries"

Nathan Thomas (21 October 2013, via Google Play reviews)

*** (3 Star)

An improvement over the last two. Definitely a lot more text in this last book. Whether that's because the author prefers these games, or was really trying harder is not for me to say, but could still have done with going into more depth.

Warren Mascot (13 October 2015, via Google Play reviews)

***** (5 Star)

Loved researching into the evolution of environments! You can really feel how players navigated in recent years and where we are now!

Karen Watts (22 December 2013, via Google Play reviews))

***** (5 Star) Amazing Wonderful

Nathan Thomas (21 October 2013, via Google Play reviews))

*** (3 Star) Too many pictures, too little text The book starts well, but quickly devolves into the author placing images and making the odd comment on games i can only view as being his favourites. Could do with more text It was a good, albeit short, read. Definitely something that interests me, and whilst the text that was present was well written, there were a few missing words which detracts from the professionalism the book is trying to present, and many of the pages were simply images themselves, with no text to accompany them. The book could use a lot more text and study, but all-in-all an enjoyable read, and I'll read the other books in the series too

Joel Lawton (24 October 2015, via Google Play reviews))

**** (4 Star) I good visual good into the history of video games. Nothing too academical so its an easy causal read, filled with pictures with keeps true to the name of the book.

Anonymous comments collected through various testing events

Virtual Landscape Pivot Tool Feedback

Positive comments	Negative comments
Much better than a book, I would use it for my modules, I want to use this for my projects, it's fun the instant zoom feature is really nice, the games are ranging across lots of years,	Loads bing, a bit slow. Needs updating, lots of games missing?

ShadowMoss Island Feedback

Positive comments	Negative comments
Jumping off the waterfall was amazing, Looks great, really feels serene and peaceful, beautiful scenery, I want to play this as it is, looks amazing, loads of areas to explore, the caves are cool, the hole in the forest links to the caves is a really nice design, it feels familiar and looks great, lovely tree's and light they look beautiful, I like the cliffs they look real, the water is really cool. The waterfalls sounds real, caves are really nice	No gameplay, needs a mission, needs story, lacking a normal game, needs a different player, glitches in some places, feel hard to walk up the mountain side, textures are blurry or messed up, caves need work.

MindFlow Tool Feedback

Positive comments	Negative comments
Really nice amount of references in one view, very easy to use, it's only in a browser that's awesome, no extra software needed, it works on my mobile and pc that is really cool,	Can't add to the view with my own images, I want to move things around, no sound or video, that would be really useful, I want to add my social media stuff and link to facebook.

Appendix E: VNED Framework V3 - Design Guidelines

	Artefact References	Design Guidelines/Recommendations
A) Psychographic		
Keyword/Environment Character Component	1. Geology	1a) Golvellius 1a) Hidden underground entrances to other parts of the map, shouldn't be given but earned through exploration
		1b) King's Quest 3 1b) Unexpected Geological rock formations can break up the visual monotony of a landscape and can draw the player towards them.
		1c) CaveLord 1c) Dynamic geological phenomena (i.e. rockfalls) can add sense of believability and immersion to a natural environment.
		1d) Zelda: Wind Waker 1d) Large land masses aren't as interesting to explore as many smaller archipelago type islands. The smaller landmasses are easier to mentally digest (location, features etc.) than a large solid landmass.
		1e) Phantasy Star Online, Cavelord 1e) Caves, especially underground caverns and canyons can form intriguing secondary areas hidden below the terrain.
		1f) Oblivion 1f) Rock types should vary (i.e. limestone) across environments and should reflect natural phenomena such as erosion, reflecting the natural passage of time
	2. Landform	2a) King's Quest 5 2a) Cliffs
		2b) 2b) Rock formations can form powerful natural signposts in a virtual environments
		2c) Kyrandia 2, Daggerfall, Oblivion, Skyrim 2c) Hypsometry (the measurement of land elevation relative to sea level) can be extremely useful in creating more immersive environment i.e. allowing players vertical as well as horizontal movement.
		2d) King's Quest 5 2d) Rock arches can be inviting thresholds for a player to cross and as such form useful 'gateways' to guide the player.
		2e) Half Life 2 2e) Natural paths evoke far more interest and more engaging if they restrict movement types i.e. narrow paths on cliffs forcing players to walk are very useful in playing on instinctual fears of falling.
		2f) Skyrim 2f) Paths do not always have to lead somewhere and in fact dead-ends are far more engaging and if used correctly can help players 'earn' the correct route through trial and error
	3. Soils	3a) Kyrandia 2 3a) Variation on 'soil' type can add create an interesting natural obstacle to overcome to i.e. virtual quicksand.
		3b) 3b) Soil type could be used to alter player movement speed depending on the 'soil type' as opposed to the standard movement speed applied to most games
		3c) The Witcher 2 3c) Soil types can also influence accessibility of environment and by dynamic (i.e. flooded marsh plains)
		3d) 3d)

	Artefact References	Design Guidelines/Recommendations	
B) Cultural			
Keyword/Environment Character Component	4. Land Use	4a)	4a)
		4b)	4b)
		4c)	4c)
		4d)	4d)
	5. Settlement	5a) Morrowind/ LoK2	5a) Tree Cover/Flora can function as architecture i.e. mushrooms as tree cover or trees as bridges, this can be used to support narrative or design (i.e. reinforcement of the player being on an alien world)
		5b) Morrowind, Oblivion	5b) Evidence of ancient settlements can add a layer of authenticity to a natural landscape.
		5c)	5c)
		5d)	5d)
	6. Enclosure	6a)	6a)
		6b)	6b)
		6c)	6c)
		6d)	6d)
7. Time Depth	7a)	7a) Natural landscapes should evidence the passage of time, whether that be through processes that are either natural (such as erosion/weathering) or through man made (such as prehistoric ritual and settlement sites - flint mines, burial mounds)	
	7b)		
	7c)		

NOTE:

TIME-DEPTH: A strongly historic landscape with visible links to the past and sense of time-depth including prehistoric ritual and settlement sites - flint mines, burial mounds and visually dominant hillforts; abandoned field systems surviving as earthworks on the high downland, but extensive below ground elsewhere testify to centuries of cultivation and use by farming communities from the Neolithic to the present day.

<http://www.southdowns.gov.uk/wp-content/uploads/2015/03/ILCA-2005-Introduction.pdf>

	Artefact References	Design Guidelines/Recommendations	
C) Surface Cover			
Keyword/Environment Character Component	8. Tree Cover	8a) PSO: AOTI	8a) Types of Tree cover are geo-dependant, and cultural preferences may exist relating to the type of tree cover present.
		8b) Morrowind, Oblivion	8b) Tree cover does not always have to be present; terrain and appropriate flora can make for interesting and aesthetically pleasing landscapes
		8c) Maupiti Island	8c) Tree cover if used in a very sparse manner acts as a natural waypoint and players will often be drawn to such 'lone' instance and can draw in player attention and act as a distinct environmental landmark
		8d) Skyrim	8d) Tree Cover can be used to differentiate landscapes within an environment, this can be done by grouping trees/flora aesthetically (similar colours) or by type
		8e) Skyrim	8e) Tree Cover condition can be used to indicate other environmental dangers i.e. warn of environment hazards
	9. Flora & Fauna	9a) CaveLord	9a) Flora should be dynamic (rustling leaves, swinging vines) and not require the player to interact with it for movement to start
		9b) Phantasy Star Online, PSO:AOTI, Morrowind	9b) Flora found in unexpected environment (i.e. subterranean flora found on the surface, or vice versa) can create an interesting and unusual environment, by combining the familiar but in an unexpected context (i.e. palm trees growing underground, or giant fungi growing on surface soil)
		9c)	9c) Flora does not have to be aesthetically pleasing to be engaging; contrasting regions can help break the visual monotony of an environment
		9d)	9d) Flora does not have to be at foot level, variation can be used to overwhelm/confuse a player if needed (dense thicket protecting route/entrance)

	Artefact References	Design Guidelines/Recommendations	
D) Environmental Conditions			
Keyword/Environment Character Component	10. Weather	10a) Robin of the Wood	10a) Using a black sky can bring a natural environment to life through a colour balance
		10b) Morrowind, Crisis Mickey Mouse	10b) Weather patterns can add a real depth to the natural environment, however this need to go beyond standard weather patterns (grey cloudy skies with rain, summer clear blue skies) to include unusual subtle occurrences (i.e. bright summer thundery shower)
		10c) Daggerfall, The Witcher 2	10c) Weather patterns can range from obvious to subtle and do not have to follow physical world patterns or conventions unless desired.
	11. Climate	11a) Oblivion	11a) Climate can be used to either enforce expectations or break them dependant on narrative/design choices (i.e. snowy mountains)
		11b)	11b)
		11c)	11c)
		11d)	11d)

12. Season	12a) Soul Reaver2	12a) Seasonal changes can alter the physical characteristics of the environment, allowing for the same fixed environment space to be used in a variety of different ways dependant on the season (i.e. an underwater lake area becomes frozen, the lake's surface now becomes an alternate gameplay area)
	12b) Oblivion	12b) Changes in seasons will affect all aspects of the environment, notably the changes in flora & fauna consistency (all aspects reflect one season) can be used to add to the immersion & believability or inconsistency (i.e. summer & winter combined) can be used to create an experience that is unsettling or unusual.
	12c)	12c)
	12d)	12d)


		Artefact References	Design Guidelines/Recommendations
Keyword/Environment Character Component	E) Hydrology and Water Bodies		
	13. Water Bodies	13a) Zelda Wind Waker	13a) Large bodies of water can be used to add a sense of isolation and unease, and heighten the appreciation of land, if used properly.
		13b) Morrowind	13b) Waterfalls can be intriguing natural phenomena to simulate in a virtual environment and can pull a player towards a specific location
		13c) Zelda OOT	13c) Rivers and streams can be useful natural 'paths' leading player to designated areas
		13d)	13d) The sound of running water should be amplified, waterfalls and fast flowing rivers should be heard from a relatively large distance away.


		Artefact References	Design Guidelines/Recommendations
Keyword/Environment Character Component	F) Distinctive Features		
	14. Geomorphosites	14a)	14a) Geological landmarks can be used as natural waypoints
		14b)	14b) Geomorphosites can vary and can take the form of natural entities such as tree cover, landform, water sources or objects that have a cultural/historical significance.
		14c)	14c) Geomorphosites can either be single instances of an object i.e. tree, rock) or a small group of objects that are somehow unique.
		14d)	14d) Geomorphosites can be differentiated to by aesthetic i.e. colour size or other attributes
		14e)	14e) Geomorphosites can be either natural occurrence man-made and may have been modified, damaged, and even destroyed by the impacts of human activities.

	Artefact References	Design Guidelines/Recommendations
Keyword/Environment Character Component	F) Psychological	
	15. Memories Associations, Preferences	
	15a) PSO:AOTI	<p>15a) Cultural associations can impact strongly on how environments are perceived.</p> <ol style="list-style-type: none"> 1) Landscape Preferences can range from geological/landform to tree cover. 2) Affordance in the environment: Habitat preferences, shelter, water and defence can impact preferences for particular landscapes and areas. <p>Paths should forms loops and interconnecting allowing players to travel between landscapes in an environment</p>
	15b)	
	15c)	
15d)		


Appendix F: Virtual Landscape Reflective Analysis

The complete Reflective analysis can be found in DVD2, a sample is provided below.

Game: Populous		
Reflection	Keywords	Sensory: Agency Cultural Character: Settlement
	Comments	<p>Bullfrog's seminal 1989 classic <i>Populous</i> will forever be marked as a milestone in natural environment design and interactivity. The natural environment wasn't a backdrop to the game's other mechanics, it <i>was</i> the main mechanic.</p> <p>The concept behind populous one of the first 'god sims' (players would take on the role of a deity, influencing the lives of smaller AI driven entities through manipulation of external factors such as terrain in the case of Populous) was to use an array of powers to either build or destroy land, thereby either aiding or obstructing human followers inhabiting the land, the more you obstruct the 'enemy' followers and aid your own the more mana (power) can be gained to access more destructive natural phenomena such as earthquakes, floods and volcanoes. The game was a revolution, it played in real-time, levelling the land altered the level of sophistication of the settlements built by the human followers, it was dynamic and instantly observed.</p> <p>Many gamers experienced megalomaniacal moments of raising a volcano on an occupied land, destroying the settlements and witnessing the enemy deity's followers scatter and attempt to start building again. The game's isometric, tile based graphics were crude and huge advancements have been made since, but the level of agency (meaningful interaction) in shaping the land in any number of unique ways(you could stack effects so an earthquake followed by a flood would prove much more devastating than the singular non-combined events) is still remarkably high. One of the biggest criticisms</p>
Process	Difficulties	Game was not available on PC format, emulation was used to run game
	Breakthroughs	Very difficult to extract the game landscape without additional overlay, the game did not display additional overlay in part of screen space (could be stitched digitally)
	Process Adapted	Used Dgen121/genecysst/Fusion3.63 emulators to run game, screenshot captured, screenshots stitched together manually in Photoshop
Image		

Game: The Legend of Kyrandia 1		
Reflection	Keywords	Physiographic: Geology, Landform
	Comments	<p>Title: The Legend of Kyrandia Book One</p> <p>Platform: PC-DOS</p> <p>Developer: Westwood Studios, Publisher: Westwood Studios (1992)</p> <p>A relatively unknown game, <i>The Legend of Kyrandia</i>, a fantasy point and click adventure was known for its simple, intuitive interface, as well as introducing with world of Kyrandia. The game also presented the world as a self-contained island in which distinct landscapes (each forming a unique game-space) could be found.</p>
Process	Difficulties	<p>Old PC Game (compatibility issues running in Windows)</p> <p>Ripping images from old DOS games this weekend the legend of Kyrandia 1/2 I've tracked down the cps2bmp and pakext tools but LOK1 is being difficult arghhh! Colour palettes don't match up even with the /kyra1 switch ... I've written to terraesperz on vgmaps.com to see how he did it, hopefully he'll respond.... I've upscaled and corrected the images I have in PS cs3 and used the portraiture plugin to take the edge of the raw pixelation... Not sure if I'm happy with the end result ...</p> <p>-Stick with the 320x200 DOS look or correct with a hint of anti-aliasing since the aesthetic isn't the primary purpose..HmMMM</p>
	Breakthroughs	Found a few useful tools, GFE 1.32, cps2bmp and pakext, and the game file format page, very useful for getting at those game landscape scenes...
	Process Adapted	Realised next few games may be possible to use cps2bmp to convert the files into usable images.
I m a g e		

Game: The Elder Scrolls III: Morrowind	
Reflection	<p>Keywords Natural: Geology, Environmental Conditions, Tree Cover, Flora & Fauna</p> <p>Title: The Elder Scrolls III: Morrowind Platform: PC-Win Developer: Bethesda Game Studios, Publisher: Bethesda Softworks (2002)</p> <p>Bethesda's third instalment in the <i>Elder Scrolls</i> series, continued with the open world action role playing game genre following on from its predecessors, <i>Daggerfall</i> and <i>Arena</i>. <i>Morrowind</i> takes place on Vvardenfell, an island in the Dunmer province, located in the far northeastern part of Tamriel, the fictional continent on which all the <i>Elder Scrolls</i> games take place. Vvardenfell was an island sub-continent within Tamriel.</p> <p>The island itself was largely dominated by the 'Red Mountain'; a giant active volcano located in the centre of the island, which constantly spewed out choking red fumes and smoke. The island's landscapes were varied ranging from rocky highlands, arid wastelands, to the swampy wet coastal regions, all filled with a variety of strange and unusual flora and fauna.</p> <p><i>Morrowind</i> was one of the first free-form environments that many players felt they had a real sense of freedom: the freedom to wander off a beaten path, away from the main quest, wandering to explore and see how far one could travel in any direction, and it felt like an endless, vast never ending journey (although in reality it was quite a limited world space compared to modern equivalents, and also its predecessors). <i>Morrowind's</i> natural environment although now crude by modern standards was richly atmospheric, there was more than one occasion when I would simply stare at the beautiful transition from the nebula filled night sky to the tranquil pink dawn, there was no rush to find the next location, or to progress the main story, but just to experience the wonderfully strange yet familiar natural environment.</p> <p><i>Morrowind</i> was one of the first games that many players noted they really felt they experienced the day and night cycle within a game: this was more than a simple sudden colour change indicating nightfall for instance. Dusk would creep up slowly as you wandered the tranquil island of Vvardenfell, within a few game hours the beautiful sky would be littered with stars and picturesque nebula, only to gradually fade, with the early morning sun washing the dark night away. I, like many players, became transfixed with experiencing changes such as these in the landscapes, rather than pursuing the primary goals set in the game, and 'map filling' quickly became an obsession. Filling the in-game map with useful local and world map information, to identify landmarks and waypoints and to establish routes to and from locations became more appealing than following the narrative and engaging with the game's primary quests.</p> <p>On comparison with later 3D natural environments, the landscapes within <i>Morrowind</i> were shockingly empty and devoid of what one would expect in a natural environment. The environment consisted of nothing more than simplified terrain (which was limited to the generic soft undulating hills), with a few rounded rock formations and a basic level of tree cover, which consisted of a combination of normal tree types and strange xeno-trees (giant fungi inspired hybrids), with the odd small shrub, scattered; however there was very little beyond this.</p> <p><i>Morrowind</i> was also noted for its dull green and brown colour palettes in its landscapes; some would argue that these gave the game an original and unique feel, others that it gave the game an "oppressively drab" look. Nonetheless the game was well received and a growing army of fans started to create modifications (these were additional assets such as models, textures etc. created for the game world). A</p>
	<p>Comments</p>

		<p>large percentage of these 'mods' were aimed at improving/adding to the environment. Typical 'mods' would often focus on character, in-game object or gameplay improvements and changes, however, the large number of landscape mods for <i>Morrowind</i> indicated that players were engaged with an aspect of the game not typically recognised as a main focal point of interest, and perhaps this was something that game designers should have recognised earlier, as a key unique selling point, and further developed the design around this.</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Process</p>	<p>Difficulties</p>	<p>N/A (PC game was easy to source)</p>
	<p>Breakthroughs</p>	<p>Console commands to disable hud, change FOV(90), useAutogigapano to create panorama then Photoshop to fix colour/crop/resize.</p>
	<p>Process Adapted</p>	<p>N/A</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Image</p>		

Appendix G: LCA to VNED V1 Framework

Landscape Character Assessment Component	Natural Environment Games Design Component Equivalent
1. Aesthetics	1. Aesthetics
a. Sight:	a. Visual:
i. Colour	ii. Colour
iii. Texture	iv. Texture
v. Pattern	vi. Pattern
vii. Form	viii. Form
b. Sounds	c. Sounds
d. Smells	e. Smells
f. Touch/Feel	g. Agency (Meaningful Interaction)
2. Perceptual(Psychological)	2. (Psychological)
a. Memories	b. Memories
c. Associations	d. Associations
e. Preferences	f. Preferences
	<ul style="list-style-type: none"> 1. Personal space and territoriality 2. Habitat Selection 3. Affordance 4. Greenbie's Placenessness 5. Landscape Aesthetics
3. Cultural:	3. Cultural:
a. Land Use	b. Land Use Urban Arable Farmland Pastoral Farmland Rough Land Woodland
c. Settlement	d. Settlement Urban Clustered Dispersed Coalfields Planned Unsettled
e. Enclosure	f. Enclosure
4. Natural:	4. Natural:
a. Geology	b. Geology Fluvial Drift Tertiary & Mesozoic Upper Palaeozoic Caledonian
c. Landform	d. Landform Vales & Valley Floors Rolling Lowland Upstanding

	Sloping High Land
e. Air & Climate	f. Environment Conditions Weather Cycle Visibility(fog)
g. Soils	h. Soil (Movement Rate?) Deep Soils Shallow Soils Impoverished Soils Gleyed SoilsBog/Fen Peat
i Tree Cover	i Tree Cover Unwooded Other Trees Coverts & Tree Groups Estate Plantations Secondary Ancient Woods
h. Flora & Fauna	h. Flora & Fauna

B & D combined=Natural Patterns Forms

Appendix H: LCA to VNED Design Framework V2

Area	Perceptual Considerations <i>(missing Smell & sound as too extensive)</i>		
	Sensory: Visual	Psychological	Sensory: Agency (tacit or otherwise)
A) Physiographic Character	1. Aesthetics <ol style="list-style-type: none"> 1. Colour 2. Texture 3. Pattern 4. Form 	1. Psychological <ol style="list-style-type: none"> a) Memories b) Associations c) Preferences <ul style="list-style-type: none"> ○ Personal space and territoriality ○ Habitat Selection ○ Affordance ○ Relph’s Placenessness ○ Landscape Aesthetics 	
1. Geology			
a) Fluvial b) Drift c) Tertiary & Mesozoic d) Upper Palaeozoic e) Caledonian			
2. Landform			
a) Vales & Valley Floors b) Rolling Lowland c) Upstanding d) Sloping e) High Land			
3. Soils			

<ul style="list-style-type: none"> a) Deep Soils b) Shallow Soils c) Impoverished Soils d) Gleyed Soils e) Bog/Fen Peat 			Movement Speed/impact on health
B) Cultural Character			
4. Land Use			
<ul style="list-style-type: none"> a) Urban b) Arable Farmland c) Pastoral Farmland d) Rough Land e) Woodland 			
5. Settlement			
<ul style="list-style-type: none"> a) Urban b) Clustered c) Dispersed d) Coalfields e) Planned f) Unsettled 			
6. Enclosure			
7. Time Depth			
C) Surface Cover			
8. Tree Cover			

<ul style="list-style-type: none"> a) Unwooded b) Other Trees c) Coverts & Tree Groups d) Estate Plantations e) Secondary f) Ancient Woods 			Seasonal Change, auto Falling down (rotten roots)
9. Flora & Fauna			
<ul style="list-style-type: none"> a) Flora b) Fauna 			Movement, alpha maps,
D) Environmental Conditions			
10. Weather			
11. Climate			
12. Season			
E) Hydrology & Water Bodies			
13. Water Bodies			
F) Distinctive Features			
14. Geomorphosites			

Appendix I: List of Games Selected For Visual Analysis

Selected Games-Embryonic Era (1980-1990)

Game Title	Platform	Year of Publication
Dig Dug	PC	1982
Forbidden Forest	C64	1983
King's Quest 1	PC	1984
King's Quest 2	PC	1985
Duck Hunt/	NES	1985
Robin of the wood	PC	1985
King's Quest 3	PC	1986
Alex Kidd in Miracle World	SMS	1986
Wonderboy/Dragon Quest 1	SMS/NES	1986
Phantasie	PC	1987
The Faery Tale Adventure	PC	1987
The Legend of Zelda	NES	1987
Phantasy Star 1	SMS	1987
King's Quest 4	PC	1988
Golvellius	SMS	1988
Quest for Glory	PC	1989
Populous	MD	1989
Psycho Fox	SMS	1989
Willow	NES	1989
Ghouls & Ghosts	MD	1989

Selected Games - Transition Era: 1990-2000

Game Title	Platform	Year of Publication
King's Quest 5	PC	1990
Crystals Of Abor	PC	1990
Mickey Mouse: COI/	MD	1990
Maupiti Island	PC	1990
Kings Bounty	MD	1990
Conquests of Longbow	PC	1991
Super Ghouls & Ghosts/	SNES	1991
King's Quest 6	PC	1992
Ishar 1/QFG3	PC	1992
Kyrandia 1	PC	1992
Kyrandia 2	PC	1993
Betrayal at Krondor	PC	1993
Flinx	MD	1994
Kyrandia 3/QFG4	PC	1994

Arena	PC	1994
Donkey Kong	SNES	1994
Shannara/Albion	PC	1995
Tales of Phantasia SNES	SNES	1995
Daggerfall	PC	1996
Guardian Heroes	Saturn	1997
Goldeneye	N64	1997
Banjo Kazooie	N64	1998
Zelda Ocarina/	N64	1998
Tales of Phantasia	PS1	1998
Donkey Kong 64	N64	1999

Selected Games - Modern Day Era: 2000-2010

Game Title	Platform	Year of Publication
Phantasy Star Online	PC/Xbox/PS2	2000
Wizardry 8	PC	2001
PSO v2	PC	2001
Morrowind	PC	2002
Zelda Wind Waker/	Gamecube	2003
Half Life 2	PC	2004
Fable 1: TLC	XBOX	2005
Oblivion	PC	2006
Call of Juarez 2	PC	2006
Half Life 2 ep2	PC	2007
Unreal Tournament 3	PC	2007
Crysis	PC	2007
Crysis Warhead	PC	2008
Fallout 3	PC	2008
Fable 3	PC	2010
Skyrim	PC	2011
Dear Esther	PC	2012

Appendix J: Biophilic to VNE Design Grid

Biophilic Design Category	Sub Category	Virtual Environment Design Considerations/Notes
<p>Nature in the space</p>	<p>1. Visual Connection with Nature. A view to elements of nature, living systems and natural processes.</p>	<p><i>Applicable</i> Natural flow of a body of water • Vegetation, including food bearing plants • Animals, insects • Fossils • Terrain, soil, earth</p>
	<p>2. Non-Visual Connection with Nature. Auditory, haptic, olfactory, or gustatory stimuli that engender a deliberate and positive reference to nature, living systems or natural processes.</p>	<p><i>Partially applicable (auditory)</i> Fragrant herbs and flowers • Songbirds • Sound of Flowing water • Weather (rain, wind, hail) • Sun patches</p>
	<p>3. Non-Rhythmic Sensory Stimuli. Stochastic and ephemeral connections with nature that may be analyzed statistically but may not be predicted precisely.</p>	<p><i>Applicable and relevant</i> Cloud movement Breezes Plant life rustling Water babbling Insect and animal movement Birds chirping</p>
	<p>4. Thermal & Airflow Variability. Subtle changes in air temperature, relative humidity, airflow across the skin, and surface temperatures that mimic natural environments.</p>	<p><i>N/A to Virtual Domain</i></p>
	<p>5. Presence of Water. A condition that enhances the experience of a place through seeing, hearing or touching water.</p>	<p><i>Applicable and relevant</i> Naturally Occurring River, stream, ocean, pond, wetland Visual access to rainfall and flows</p>
	<p>6. Dynamic & Diffuse Light. Leverages varying intensities of light and shadow that change over time to create conditions that occur in nature.</p>	<p><i>Applicable and relevant</i> Daylight from multiple angles Direct sunlight Diurnal and seasonal light Firelight Moonlight and star light Bioluminescence</p>
	<p>7. Connection with Natural Systems. Awareness of natural processes, especially seasonal and temporal changes characteristic of a healthy ecosystem</p>	<p><i>N/A to Virtual Domain</i> Climate and weather patterns (rain, hail, snow; wind, clouds, fog; thunder, lightning) Hydrology (precipitation, surface water flows and resources; flooding, drought; seasonal arroyos) Geology (visible fault lines and fossils; erosion, shifting dunes) Pollination, growth, aging and decomposition (insects, flowering,</p>

		<p>plants) Diurnal patterns (light color and intensity; shadow casting; plant receptivity; animal behavior; tidal changes) Night sky (stars, constellations, the Milky Way) and cycles (moon stages, eclipses, planetary alignments, astronomical events)</p>
Natural Analogues	Biomorphic Forms & Patterns. Symbolic references to contoured, patterned, textured or numerical arrangements that persist in nature.	<i>Applicable and relevant however difficult to apply to natural landscape(out of scope)</i>
	Material Connection with Nature. Materials and elements from nature that, through minimal processing, reflect the local ecology or geology and create a distinct sense of place.	<i>N/A to Virtual Domain</i>
	Complexity & Order. Rich sensory information that	<i>Applicable and relevant</i>
Nature of the space	Prospect. An unimpeded view over a distance, for surveillance and planning.	<i>Applicable and relevant</i>
	Refuge. A place for withdrawal from environmental conditions or the main flow of activity, in which the individual is protected from behind and overhead.	<p><i>Applicable and relevant</i></p> <p>Modular refuge: Small protection (high-back chair, overhead trellis) Partial refuge: Several sides covered (reading nooks, booth seating, bay window seats, canopy beds, gazebos, canopy trees, arcades, covered walkways or porches) Extensive refuge: near or complete concealment (reading/telephone/sleeping pods, meeting rooms with 3+ walls, private offices, tree houses)</p>
	Mystery. The promise of more information, achieved through partially obscured views or other sensory devices that entice the individual to travel deeper into the environment.	<p><i>Applicable and relevant</i></p> <p>Curving edges Winding paths</p>
	Risk/Peril. An identifiable threat coupled with a reliable safeguard.	<p><i>Applicable and relevant</i></p> <p>Spatial Attributes Heights Gravity Water</p> <p>Perceived Risks Falling Getting wet Getting hurt Loss of control</p>

Appendix K: Preliminary Textual Analysis

1.0 Introduction

The selection of games for preliminary analysis is not indicative of 'greatest' game virtual landscapes, but a combination of both iconic game landscapes that the gaming communities generally hold in high regard and a personal selection based on landscapes I have encountered over the last three decades.

These case studies were based around a selection of seminal games which illustrated unique aspects of virtual natural environment design; for the purpose of this study one three elements were chosen:

- 1) Environment Interaction
- 2) Environmental Archetypes
- 3) Environmental Construction

The games chosen to form the basis of the artefact review are made up from:

- Seminal games in terms of virtual natural environment interaction and design. These games were selected after an extensive exploratory review of forums, articles, polls and general discussion and debate within the games industry.
- Personal experience of interacting with specific games. My reflections as a practitioner, as well as the specific aims of the research have led me to certain games that help form a complimentary addition to the list within the artefact review.
- The following list is not meant to indicate a definitive list of seminal natural environment games, but a mix of both identified seminal games (Populous, Oblivion, Crysis) and personal selection (Kings Quest, Worms, Kings Bounty)

Environmental Interaction (terrain)	Environmental Aesthetics (archetypes)	Environmental Construction(design planning & implementation)
Populous Worms	King's Quest 5 King's Bounty	Oblivion Crysis

Table 1: List of VNE Games selected for textual analysis.

The structure for the artefacts review is based around two areas 1) Introduction & Background and 2) Reflective Analysis & Observation

2.0 Review 1: Populous

2.1 Introduction & Background

Bullfrog's seminal 1989 classic *Populous* will forever be marked as a milestone in natural environment design and interactivity. The natural environment wasn't a backdrop to the game's other mechanics, it *was* the main mechanic.

The concept behind populous one of the first 'god sims' (players would take on the role of a deity, influencing the lives of smaller AI driven entities through manipulation of external factors such as terrain in the case of Populous) was to use an array of powers to either build or destroy land, thereby either aiding or obstructing human followers inhabiting the land, the more you obstruct the 'enemy' followers and aid your own the more mana (power) can be gained to access more destructive natural phenomena such as earthquakes, floods and volcanoes. The game was a revolution, it played in real-time, levelling the land altered the level of sophistication of the settlements built by the human followers, it was dynamic and instantly observed.

Many gamers experienced megalomaniacal moments of raising a volcano on an occupied land, destroying the settlements and witnessing the enemy deity's followers scatter and attempt to start building again. The game's isometric, tile based graphics were crude and huge advancements have been made since, but the level of agency (meaningful interaction) in shaping the land in any number of unique ways(you could stack effects so an earthquake followed by a flood would prove much more devastating than the singular non-combined events) is still remarkably high.

2.2 Reflective Analysis & Observation

1. The game is highly innovative at the time nothing like, and is one of the first games where players are able to experience cause and effect in regards to environmental interaction in real-time i.e. changing the terrain the resulting effect on the farms/food supply and then the people living on the land
2. The game was not just about destruction! Although there is a fascination in modern games in destroying the terrain/environment, Populous gave the player abilities in both creating and destroying the world (although some of the in-game powers such as volcano/swamp lean the design over to favouring destruction)
3. The game is essentially an abstract toolset linking manipulation to the real-time /terrain changes
4. The game is arguably the first terrain deformation game, and sadly a modern day equivalent doesn't exist (although tech is Fracture gameplay selling point)
5. Populous was the first game to 'weaponize' the environment i.e. use of natural environment phenomena such as earthquakes and floods as weapons
6. Populous was also the first games to almost be an editor that was converted to a game Open up the idea of gameplay, sandbox tools, maybe take a terrain editor to be a part of a game?
7. Terrain deformation isn't enough, must have resulting impact (i.e. settlement changes)
8. The game design behind Populous, features layers reflected in landscape character assessment (geology->settlement type)
9. The aesthetics are surprisingly strong for the time; real-time terrain deformation works in the isometric view, and creates a sense of immersion.
10. The terrain deformation is limited to the Z axis manipulation and only up to a maximum of six levels
11. The cover art image is a little too removed from actual gameplay, one is unable to separate the ground from the terrain i.e. can't extract the ground to create floating 'chunks' of terrain
12. The game focuses on meaningful interaction as opposed to free interaction, i.e. Agency in allowing only manipulation of the terrain, and not water/sky/weather effects etc....
13. The minimap gave a real organic sense to development of the landscape (terrain+settlement+people), no two maps every the same, the organic flow of terrain development was unique, could be used to create emergent gameplay even in such a limited tech, i.e. building land bridges little by little by destructive terrain manipulation allowing a path to be created against the gamerules (only allows manipulation next to settlement)
14. The terrain varies from world to world. Games take place on worlds that range from hot deserts to ice masses, with each terrain type affecting the game in different ways. i.e Walkers die faster in the desert, on Ice Worlds population increases more slowly

3.0 Review 2: Worms

3.1 Introduction & Background

Worms is a 2D strategy game created in 1995, by Team17. The game featured both single and multiplayer modes, allowing up to teams of four people to play across a 2D terrain. Gameplay involved killing opposing 'worms' by traversing along the 2D terrain using a variety of weapons. The game was unique since the environments, which ranged from forests to deserts to a moon environment, allowed players to destroy any part of the terrain, allowing for complex gameplay to develop as players often used this in a variety of ways to kill opposing players, including shaping complex tunnels to both hide and kill players from underneath, or simply removing the terrain to such a point that an opposing player's worm would simply fall 'through' the empty space to their death.

The game also featured two win and gravity, both of which affected the trajectory of certain weapons, adding other elements to the simple yet complex gameplay.

3.2 Reflective Analysis & Observation

- The "Worms" series features terrain which can be completely obliterated.
- The use of gravity and wind were simple yet powerful additions that completely changed the nature of the gameplay, allowing for complex defensive and offensive strategies to emerge.
- The game features the 'ant farm' 2D view of the terrain. This works well in 2D obviously causes issues in 3D (later game demonstrate this)

- The pixel perfect terrain destruction where any part of the terrain can be destroyed, is not limited to just vertex/predefined sections of terrain destruction-> leads to emergent gameplay and thinking (safety bunkers etc..., digging down etc...) experience
- The game provided a random Map generator (following on from a feature in populous) as well as predefined terrain maps with interesting twists adding for a huge amount of replay value to the game.
- There is limited interaction in environment, boulders, tree's, ground, soil all had same resistance to explosions and acted in the same manner, possibly a design choice since introducing material types and resulting hardness would have introduced too many variables to test and hence led to possible buggy gameplay, However one can imagine that maybe room exists for this to be very effective gameplay addition. Imagine blasting the ground beneath a fir tree so the tree would fall over pushing a rock over the edge and killing a worm below.(figure 1)

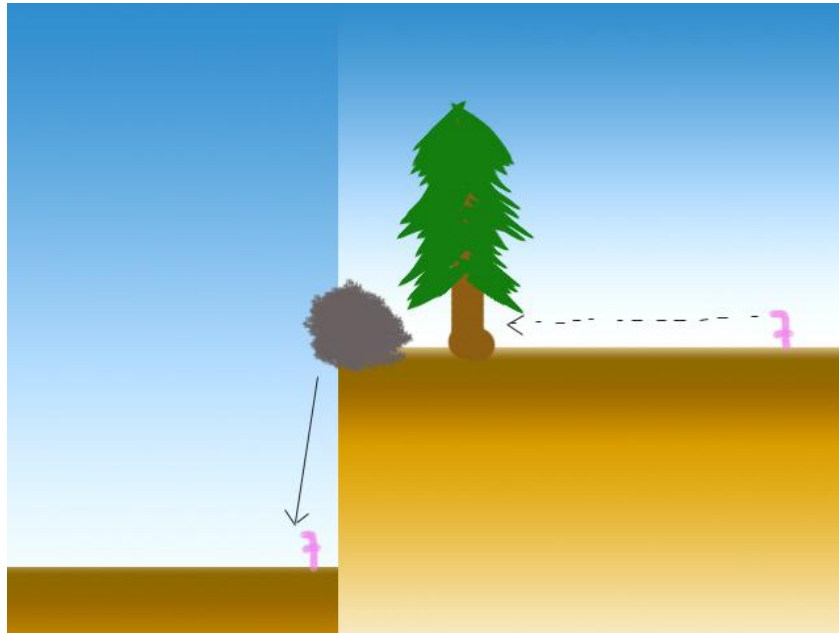


Figure 1: Diagram of Worms game with physics based gameplay

4.0 Review 3: Kings Quest 5

4.1 Introduction & Background

King's Quest 5 illustrated the emergence and shift in game environments to intricate natural landscape matte painting rather than the pure digital pixel environments of the embryonic era. From the precarious grassy cliff verge, to the musty entangled forests, the landscapes in King's Quest 5 illustrated both a leap in the graphics technologies used in creating these virtual spaces and in the design and composition of these spaces in order to serve the gameplay and narrative structures. The unusual rock formations were wonderfully archetypal; fragile yet dangerous and inviting, the precarious grassy cliff verge, with the natural archway prompted the player to explore further and highlighted the attention to detail that was placed in each and every environment scene in the game.

Navigating the pseudo 3D space was carried out within the confines of a 2D grid (the background was played as 3D space, but the player could only move on a 2D 'X/Y' plane in reality) and was a potential design issue. However in this instance one can see guiding the player's progression through specific gateways is much easier by utilizing the physical environment, i.e. Stone Archways, as natural waypoints.

The wonderfully tangled and twisted roots structure in the forest landscapes highlight a believable organic flow in the landscape, where nature isn't constrained, the roots of a small tree appear to penetrate and split the boulders scattered around the landscape. Moss, lichen, weeds intermingle with the decaying stumps of dead trees; the different components of the landscape are still discernible. Later the move into early 3D environments, would illustrate this to be an inherent weakness of 3D environments i.e. blending different landscape elements into a coherent, believable space.

Modern 3D games environments are afforded the luxury of essentially limitless virtual space in comparison to the early games such as King's Quest which utilized each screen as a carefully designed natural environment

space (i.e. as a series of distinct landscapes). Each view was both an aesthetically rich (picturesque) and designed (player navigation) space.

Each landscape scene had a definite path one could imagine following, whether it was the geology, or flora, created through a close alignment between the environment design and gameplay, the environment steered the player through. Translating this effectively to a full 3D environment isn't without significant challenges, as the design considerations increase exponentially with modern 3D environments. A case could be made however that perhaps some of those archetypal reductionisms could be used by a designer to steer the player towards intended key points in the environment, linked to gameplay or narrative.

4.2 Reflective Analysis & Observation

- Each scene in the game is carefully composed, and reinforces the narrative, it is a controlled designed space.
 - Certain landscape/terrain features (archetypes?) are present that don't appear in modern day equivalent game (result of weak tech informing design then becoming base game design and built upon?)
 - Vertex height map terrain, could only go up and down, most Terrain design followed this path, expensive and time consuming to build custom meshes?
1. Crysis used voxel brushed for custom terrain objects, perhaps a better approach, maybe what's needed is custom library of terrain brushes?(i.e. rock formation brushes)
 2. The game featured carefully arranged elements of 3 landscape character assessments types: geology(terrain) are demonstrated
 - a. Physiographic (Geology, Landform, Soils,)
 3. Cultural (Settlement, Tree Cover ,Land Use)
 4. Perhaps the limited screen space or game areas/regions forces a realisation that environment is key in reinforcing the narrative, 3D games environments can afford to have empty space KQ games used each screen as a vantage point to view the natural landscape(very reminiscent of landscape photography rules such as framing/rule of two thirds etc

5.0 Review 4: Kings Bounty

5.1 Introduction & Background

The Megadrive game arrived as a gift from the USA, in the trademarked oddly shaped, EA cartridge. Ten minutes before I was due to leave for school, curiosity took hold (...yeah I'll try it for 5 minutes) resulting in a feigned illness in order to stay home and play the game that would spark my journey into the world of virtual landscapes, since my earliest attempts at modding/hacking and games development started with this very title.

From the very moment I picked up the manual which I continued to read from cover to cover over the years, this wondrous new world was a free roaming environment in a similar vein to Golvellius, a turn-based strategy game in which a wandering hero who was free to roam a vast uncharted world(in this case several continents). The key to moving to a new continent lay in finding new maps to allow distant travel, desperately searching treasure chests hoping one would reveal a map to the next continent; this was a greatly anticipated moment of joy, as a new map would allow further exploration of new hostile lands, to the wonderfully apt named places such as *Forestria*, *Archipelagia* or *Saharia* accessing different continents not allowed for progression but in turn access to better troops and equipment.

King's Bounty served as a beacon in my passion for gaming, in particular free roaming natural environment simulation, shortly after experiencing what the game had to offer an insatiable quest to replicate the experience of free-roaming discovery started, the game triggered a response, not one of addition to the console or the game, but one of actual discovery, progression and the unique richness of a free interactive form supported by underlying narrative.

The narrative in the manual detailed villains, places, plot and constantly making reference to the clichéd legends speaking of '*distant lands*'. The difference between *The Forest of Doom* (an old fashioned gamebooks in which the reader would create an individual experience through a fantasy world based on a branching path format navigating the numbered sections of text based on a set of game rules) and this, was that the individual experience constructed through a combination of these two elements; the underlying game plot found in the manual & the in-game experience was a potent one.

5.2 Reflective Analysis & Observation

1. Kings Bounty was one of the first games from a personal perspective that engaged me on so many levels
2. KingsBounty featured a manual in which a strong link from the games narrative to physical landscapes was made (inferred stories)
3. The game allowed players the ability to explore openly and freely , and was only dependant on finding 'maps' to additional lost continents
4. The game contained wonderfully rich and themed environments each name after a fictional content i.e forestria to saharia
5. There was no automatic manner to access full maps or access to the different landscapes in the game, and was almost reminiscent of hiking, or olden days cartography, the intrigue of finding waypoints/locations and creating personal maps of the virtual space was exhilarating and an immersive feature
6. The game used different natural environments , and each supported different creatures, knowledge of the environment helped in picking appropriate army that could be replenished and as such enable the player to beat the villians on that particular continent.
7. The game featured a strange isometric view.
8. Kings Bounty used an interesting range of archetypal environments for creature habitats (i.e. underground caves for dwarves, tree house for sprites)

6.0 Review 5: Oblivion

6.1 Introduction & Background

Bethesda's fourth game in the *Elder Scrolls* series was a pivotal turning point in natural environment design. The developers as part of the design process went beyond the internal development research by visiting University of Maryland to study geological processes such as erosion, growth of plants and meteorology. Todd Howard executive producer for *Oblivion* in an interview summed this up: *"The team at Bethesda actually consulted the University of Maryland geological lab in order to generate accurate algorithms for producing realistic environments. This also means that the forests in Oblivion are randomly generated meaning no two areas will be alike"*.

Lessons from Bethesda's earlier *Elder Scrolls* game *Morrowind* were also learned, from the feedback on the unrealistic smoothed over hand-crafted hills of *Morrowind*. The driver in *Oblivion's* landscape design was efficiency, the vast landscape of *Oblivion* could not be crafted by hand as this was far too time consuming (and therefore expensive). *Oblivion's* programmers therefore developed custom erosion algorithms into terrain generation, allowing a range of natural terrain from sharp craggy mountain vistas to softer undulating hills.

Oblivion demonstrates two important aspects of natural environment design. The first is going beyond visual reference and exploring disciplines around aspects of the environment (in this case exploring geology to inform terrain construction can lead to a more believable, immersive environment). One wonders if this process were to be further explored, what other disciplines could be used to enrich the design process in creating the environment

Secondly that the exponential growth of these environments are out pacing the corresponding size of the development teams, forcing the use of more and more procedural tools to be developed to automate processes once carried out by hand. Procedural tools development require a design process in themselves, and again extrapolating into the future, one can imagine natural environment production being shared more across the several disciplines .

Bethesda's fourth game in the *Elder Scrolls* series was a pivotal turning point in natural environment design.

6.2 Reflective Analysis & Observation

1. Oblivion when released was arguably the pinnacle of natural NVE design, and indicates the way the games industry is moving
2. References process: using pics/travel etc...very exhaustive, and time consuming, better to refer to a Landscape design book? And beyond the reference mage, what about reference emotional vids to capture the spirit/emotions connected with a space.....translate that from place to a 3D environments, perhaps scale and physical representation is important but non tangible qualities connected with a certain physical space are more important/pertinent to instil in a 3D VNEL? Does this show through?

3. The company used the University of Maryland geology Lab to understand rock formation/types and erosion , and used this information into the design process of the natural environment
4. Bethesda developed proprietary erosion algorithms to simulate nature's wear and tear on the environments, as well as using procedural algorithms to place forest so no two are alike (since human placement is flawed and subject to bias based on number of factors) why did they do this? How successful was it?
5. Bethesda's attempts to move beyond simple aesthetic references to using an established body of knowledge to better inform the virtual landscape design of Oblivion was a pivotal point in VNE design
6. The game made use of speedtree for procedural tree generation removing human interpretation of creating the world's flora ,. why did they do this? How successful was it?
7. An Interesting continuation from the earlier TES game, Morrowind, was that players would actively purpose choosing/find/decorate their virtual homes, this was minor part of that game expanded in the original (realisation of emergent gameplay, co-opted into formal gameplay mechanism i.e. haunted Benirus Manor
8. The Oblivion Real Estate site setup (almost travel cottage holiday site?!) is strong evidence of this behaviour , the site was used to guide players through selection of a home/location/features etc .again this had no effect on gameplay and served no purpose other than to have a customized home within the virtual landscape
 - a. <http://ljosa.proboards.com/index.cgi> ORE FORum
 - b. <http://ljosa.proboards.com/index.cgi?action=display&board=general&thread=3364>
9. Homes vary from houses, shacks, castle, tree dwellings, caves, lairs, underwater, on land, in the sky....vast array of different homes developed for different habitat needs. Why is this?

A Question was asked on Oblivion Real Estate forums in regards to why playerso focus on selecting/making and sharing their virtual homes.

Based on my own experience(s).....Homes give me a sense of place, a sense of my own space in someone else's world, yes playing RPG's often puts you in the star role, but having/creating a home gives that extra level of personalisation that makes a big difference

My own experiences probably stem from living in an inner city environment for most my life. I want that log cabin on the mountain with a distant view, with a stream running behind it, and closed off by a large dense woodland behind this.... or sometimes the cave that's deep underground almost inaccessible.... or the large royal mansion that's haunted and has several hidden chambers/catacombs etc..(probably because of a recurring dream over the last 20 years!)

.....homes IMHO do several things...

1) It's a place for storing/arranging your items/objects.....I've seen many people setup their house interiors and post screenshots, almost akin to a very primitive behaviour(here is my home and look at my stuff) I foten visit my own to dump all my new items, before I save and exit.....

2) Provides a place for relaxation, to 'get away' from the game(quests, killing etc...) How do you feel relaxed?

3) Provide a sense of persistence. When you are either away from the PC or away in game from your home, it's a place, your place to get back to and it doesn't change/disappear unless you decide....

4) Provide a personal private space that cannot be entered or touched by anyone else unless your allow it....

I'm asking what emotions/feeling you experience when you create a home, or look for a new one...have you ever thought about why you want a particular home, do you try and recreate the experience of home building in other games? What do you look for in your new habitats/homes?.....are things like defence/nearby water/accessibility important etc...

Response 1: User Phadra's

**Safe storage - no where ingame can be considered safe, except in your home (or homes.) Being a collector of items this is especially necessary.*

**A place to sleep - having your own bed is nicer than having to rent a room in an inn.*

**A place to call your own - its my place, my stuff, my bed. I think this is instinctual, we carry it over from real life into the game.*

Nice things to have that aren't requirements:

**Ambiance - it could be your cozy little shack in the mountains, or a magical undersea home, or a dank evil den. Its that little extra something that makes the home feel special. Something to enjoy while you wander around putting all your loot away.*

**Location - a home in the city, the forest, mountains, or the middle-of-nowhere. Goes along with ambiance.*

**Functionality - anything from a mage's laboratory, to an armory, to a library, to a kitchen where you can cook things. This adds immersion and/or plays along with "realism" mods.*

**Extra beds/bedrooms - many players have companions, its nice for these companions to have somewhere to sleep. Also adds to immersion, since companions don't require sleep.*

Response 2: User X

Why homes? Why Oblivion's Real Estate?

Because so many people desire a place in game to call their own. Perhaps to feel a part of the world, perhaps to fill a need. We make homes to be creative, to give people choices, to make people happy, to make ourselves happy. It feels good to share with friends who have a common interest in such a moddable, extremely replayable game.

It also needs to be said, many of us have not one home installed, but many. I roleplay my characters, they have a varied selection of homes to choose from. They can move from one home to another or own visit many homes if it feels right

Both the responses lead to further questions on habitat selection & territoriality and who these real world behaviours function in the virtual world.

7.0 Review 5: Crysis

7.1 Introduction & Background

Crysis, a futuristic first person shooter, became quickly notable for its incredibly rich, detailed natural environments. The game took place around the 'Lingshan Islands'; a fictional set of Islands located to the south of the Philippines. What marked *Crysis* as different was the density and variety of foliage in the jungle environments and the sheer scale and size of the islands. Previous games that had attempted to emulate the thick foliage density of jungle environments had failed, primarily because of technical constraints. Rendering such a large number of plants would often cause inevitable slowdown leading to unplayable frame rates, however the technology behind *Crysis* allowed for an unprecedented level of flora, whilst still maintaining acceptable frame rates.

Crysis was remarkable as the jungle environments were almost congested with a variety of different flora, players could literally lose their bearing in the dense, thick foliage, the scale of the islands were also remarkable, these were not small stretches of limited confined space, but vast complete island spaces that could be explored in several ways. Coupled with this, was the remarkable attention to detail in the landscapes, one could hear waves of the sea lapping gently on the rocky shores, birds chirping in the dense undergrowth, integrated with this, was a variety of rich weather patterns which cycled with in game time(day & night). All these qualities helped to both reinforce the immersiveness of the game's natural environment and mark *Crysis* as pivotal game in virtual natural design.

Appendix L: EternalKnight Landscape Region Description

Region Name	Region Colour	Description
Vailmourne	Blue	Frozen northern wasteland, sheets of glacier ice, snow mounds, and snow buried ruins, Pines and evergreen's grow covered in snow.
Tundaric Waste's	Light Grey	Semi permafrost tundra, low sparse shrubs, hardy vegetation, little or no tree life.
Deathbrook's	Dark Brown	Scorched earth, large crevasses running through, dry cracked earth, weed infested, dark brown/black peaty soils, corrupted savanna.
Asahria Plains	Red	Hot, dry arid Mediterranean desert, sand dunes, palm tree's, barren, buried sand ruins, endless curvy sands dunes, featureless, Oases with springs and worn sandstone caverns.
Deadmoor's	Grey	Undead wasteland, dark green/grey grasses highland moors, lifeless dead trees, filled with graves/crosses, crypts and remnants of battle long ago.
Dredgemarshes	Dark Green	Swampy mangrove bog land covered with cesspools filled with rotting vegetation, lichens and moss. The ground is full of dips and boggy pits, mossy soil and leafy green/ yellow grass grows patchily with moss-covered trees.
OldPine Forest	Green	Lush green, rich evergreen forest, thick with pines and lush green trees. Ground is thick with ferns/grasses of all types, brown decaying detritus fills the forest floor
The Haven's	Dark Purple	Cultivated light brown soils, cobbled stone streets, farmed & populated agricultural rural area.
Rainbow Reefs	Light Purple	Multicoloured natural coral reefs, filled with corals/seaweed of varying colours, rich & vibrant in sea life, basking in the shallow blue temperate waters.
Pine Ridge	Light Brown	Logging area, thin grasses grow around the fallen pines, sawdust and logs of different shapes lie strewn all over, tree stumps, iron blades are left lying about.
Ghost Isles	Mid Green	Small tropical cliff isles scattered in one area, small light sandy/soil caverns, lots of low-level vegetation & fauna, a few ancient ghostly caverns.
OgreBane Isle	Orange	Rustic tropical beach, darker sands filled with clams/shells, unkempt low/high level flora & fauna. Humid temperate
Serenia Beach	Yellow	Sandy beach, tropical climate, clean white/golden sands, lots of variation in palm/coconut tree's, tall lush cultivated reeds/grasses growing out of the white chalky cliffs.

Appendix M: ShadowMoss Island Production Report 2

Moel Siabod Field Trip Report 12/04/2011

Description/ Pre-Project Reflection (<i>Reflection For Action</i>)	
1. Identification of event/incident.	Moel Siabod Field Trip, the ascent took place from 8am to 12pm the decent from 1pm to 5pm
2. Factual description/account of what you did/what happened (what, who, why, when,	The field trip took place on 12th May 2001, this was with the British Mountaineering Council, and involved a trek up Moel Siabod, a short break and descent down back to camp.
3. where, how – methodology/methods, context).	Moel Siabod (translated from Welsh it mean 'Shapely Hill') is a mountain in Snowdonia , which lies near the villages of Capel Curig & Betws Y Coed, Notes and images were takendigitally via n iphone(to be transcribed later) and images via DSLR.
3. the declaration of intentions and expectations /Assumptions	<p>The overall aim was to explore Ruskin's manifesto '<i>Go to Nature</i>' and to collect/collate knowledge, feelings and thoughts to be used to create a more authentic virtual environment.</p> <p><i>....should go to Nature in all singleness of heart, and walk with her laboriously and trustingly, having no other thoughts but how best to penetrate her meaning, and remembering her instruction; rejecting nothing, selecting nothing, and scorning nothing . . . and rejoicing always in the truth" (3.624).</i></p> <p>The intention was see if this more 'authentic' approach could shed new light on virtual natural environment design, if I was to truly accept this I would have to accept nature in full; and as such I could not 'observe from the outside' attempting to discern how the landscape was constructed and its physical/emotional impact on me, I would literally have to 'walk with her' and experience this first hand.</p> <p>Coupled with this was the intention to explore Greenbie's notion of placenessness</p> <p><i>'Placelessness' equals an inability of a setting to encourage the formation of vivid images. - Greenbie, 1981</i></p> <p>Given the finding of my past personal & professional practice(via reflection on foundation practice) that revealed a mix of virtual spaces that were both memorable and easily forgotten, I wanted to explore what this would feel like to experience Placenessness and placeness, and what particular aspects in each could be transferred to emulated to the virtual domain</p> <p>1. To observe natural geological forms in situ (aesthetic geometry etc.,,.)</p>

	<p>2. To experience nature and the landscape in a non-mediated manner (i.e direct contact)</p> <p>3. To gather primary design focused data that would enable the creation of a much richer more authentic virtual space.</p> <p><u>Expectations & assumptions:</u></p> <ul style="list-style-type: none"> • I will be able to gather meaningful insight into VNE design, the field trip will provide data that cannot be gained through other research methods, and will provide an unique insight into different aspects of the environment • Ascent should be more difficult than the decent. • Should be relatively easy, not expecting it to be too physically taxing.
<p>1. What if . . . ? (projection, speculation);</p>	<p>What is I am unable to draw out any useful observations, how will this impact the second stage of creating a more authentic virtual environment.</p>
<p>2. The pros and cons of projections;</p>	

In-Action reflection	
<p>1. What I felt during:</p>	<p>Exhaustion, disjointed expectation, so accustomed to exploring large areas of virtual landscape it's easy to forget how even a slight incline o a real landscape is physically taxing, this was instantly obvious, we can become so accustomed to exploring vast swathes of land in the virtual word</p>
<p>2.</p>	<p>There is a huge separation between being an observer (virtual domain) vs being a participator or being 'on the ground' in terms of focus: in the virtual domain the focus can be on several things but on the real landscape it's most certainly on your landscape steps, the journey your next millstone. there is very little else apart from the sound of your own heartbeat, breathing and the next few steps.</p>
<p>3.</p>	<p>Learning to plan multiple routes on climbing a summit and careful route selection, this is complex considering a range of factors had to be taken into account:</p> <ul style="list-style-type: none"> • my level of fatigue/energy, • weather conditions, • risk/danger level • time of day/remaining
	<p>There is great deal of physical testing(literally testing ground) for different soil types since this could mean misplacing a foot in 2ft deep marshy soil and lots of backtracking due to dead ends or obstacles that open prior assessment seemed passable, which would then have to be bypassed.</p>
<p>4.</p>	<p>Self accomplishment and achievement, there was a huge sense of achievement on passing particular impasse (cliff, ledge), especially on viewing a particular milestone(partial summit) and the level of achievement felt once this had been reached.</p>
<p>5.</p>	<p>There is a definite sense of fear on viewing milestones and summits, they seem so far away and progress is so slow especially when you're tired, it's shocking to realise that how unrealistic games are, exploring natural spaces is so effortless, one simply moves the controller/keyboard to move there is no 'resistance' to movement which in the physical world there is nothing but resistance to your movement (wind, rain, terrain, water etc....) very rarely do you feel the 'wind on your back'</p>
<p>6.</p>	<p>The landscape is all interconnected, there are no discrete 'sections', I'm so used to moving from distinct area to area in virtual spaces that it's hard to remember that nature is not confined by anything, it's amazing to see how a rumbling of water underground suddenly opens up into a stream further along the path, it feels like a living entity, one large interconnected organism.</p>
<p>7.</p>	<p>Walking techniques and unexpected danger: An ascent is very different in comparison to a decent, I expected the reverse, but one forgets that adrenaline is pumping on the ascent and your movement restricted by the landscape, whereas during an ascent you are often exhausted and it's very easy to build pace on a rapid decent and injure yourself.</p>

<p>Another observation is our feet operate almost as as hands whilst walking over natural terrain, each individual foot is carefully placed for maximum grip or to aid in conquering obstacles, the different parts of the foot, angle, pressure, placement, duration etc...in the virtual world this is all fixed and there is no control or input over the intricate calculation of all these variables that in a split second is calculated and executed.</p>
<p>8. Ruskin was right, there is something unique, magical about nature, this is a personal relationship, not one that can ever be mediated, the smell of the air is surprisingly as it's tinged with so many different elements(wet moss, flowers/pollen), other walkers scent, the temperature varies depending on terrain features, flowing water can rapidly cool the local environment, the spray from a flowing river can be both refreshing and unwelcome depending on your physical condition.</p> <p>The natural environment is invigorating, one can feel the energy and power of nature flowing through you at times and you feel connected to the land, almost as if you were a tree drawing nutrients from the ground, at times it reverses and you feel that the land is drawing your life into it.</p>
<p>9. Greenbie described placeness well; there are moments, parts of the landscape so nondescript that I do struggle when observing to feel moved or evoked they are barren, empty and difficult to engage with, it is easy to lose your bearing and be convinced you are walking in circles, we rely so much on waypoints or 'geomorphsites' to constantly reposition our mental landscape map in relation to the physical landscape around us.</p> <p>There are also places of meaning, whether it be an old stump or a cliff face with an unusual cave entrance or a strange rocky path, these waypoints serve as mental markers.</p>

Evaluation/Post Project Reflection	Notes
1. How well did you do it?	The field trip was partly successful, in that it provided insight into greenbie's placeness and Ruskin's 'Go to Nature' manifesto
2. How valuable was it?	The experience was very valuable as it provides an insight into areas such as self accomplishment , and
3. What did you learn? What didn't you learn?	<ul style="list-style-type: none"> • Idea that vista's or progression had to be 'earned' to be fully appreciated, finding a place to rest after an arduous walk felt like a reward. • The Idea of paths; multiple routes to one location, some with dead ends, forcing you to try walk up, backtrack, conscious route selection become a focus especially at dangerous points • Dead-ends can function as a useful refuge, or place to sit, idea of shelter, (Lone tree example) • Idea what terrain cover...i.e fauna is subtle, sometimes no more than rock and 'weeds' type hardy low lying shrubs • The Inter-connected nature of the natural environment, holes with flowing water, disappear and reappear, you can hear gurgling of water running underneath, feeling of adventure of wonder, fear and intrigue when seeing a cave, where does it lead to ? • I had earned these vista's through sweat and tears, these were my places a constructed meaning?
4. How did you feel about it?	The project was an extremely useful idea and one that has provided exactly the kind of reflection I required in order to analyse and draw out data required to build a more authentic environment. It was physically taxing however and on reflection shorter trips would have been more useful.
5. What sources of information did you find? How valuable were they?	<u>Data on geology, flora density as well as</u>
6. Why did you make a certain decision?	

<p>7. What was the most difficult thing</p>	<p>The energy and time required to simply explore the space even on a superficial level, it was exhausting. Having explored natural landscapes in the virtual domain, one is able to explore hundreds of square kilometers in hours and days, this is impossible in the physical realm, and it felt at times my body was not able to catch up with my mind desire to traverse more rapidly, was my mind accustomed to exploring these vast spaces so much so that it had out grown my physical body’s ability to keep pace with my mind desire to experience the landscape?</p>
<p>8. What was the most satisfying thing?</p>	<p>Earning a vista: a small ledge had opened up after heavy rainfall , I sat on a ledge that had perhaps not been visited for a long period of time , this was something I had earnt, almost like the landscape ad welcomed me and provided a stone ‘throne’ for me to enjoy the landscapes below Moel Siobod.</p>
<p>9. What would you have done differently?</p>	<ul style="list-style-type: none"> • Shorter trips the full day hike was far too exhausting more smaller trips aided by period of reflection/analysis over a longer period would have been more useful and gathered more data. • Individual areas (geology, flora, fauna) etc... should have been the focus of smaller trips, perhaps modelled on the Landscape character assessment qualities. • Greater selection of natural landscapes (across different environment types) • Collection reflection? Perhaps sharing the thoughts and reflections with other individuals to see if collective experience could provide richer and deeper insight into the areas.

<p>Summary/ Outcomes</p>	
<p>What advice would you give someone?</p>	<ol style="list-style-type: none"> 1) be prepared, it can be physically taxing and this sometimes hampers useful reflection, bring audio equipment as capturing ‘in action’ thoughts is much easier and very difficult using other means(pen/paper) 2) Take shorter tips focusing on different elements that you would like to consider

Appendix N: ShadowMoss Island Production 1 Report

So finally started building my first level based from the distilled design methodology derived from the work on 'Virtual Landscapes' (my 3 volume book on natural environments in games over the last 30 years)

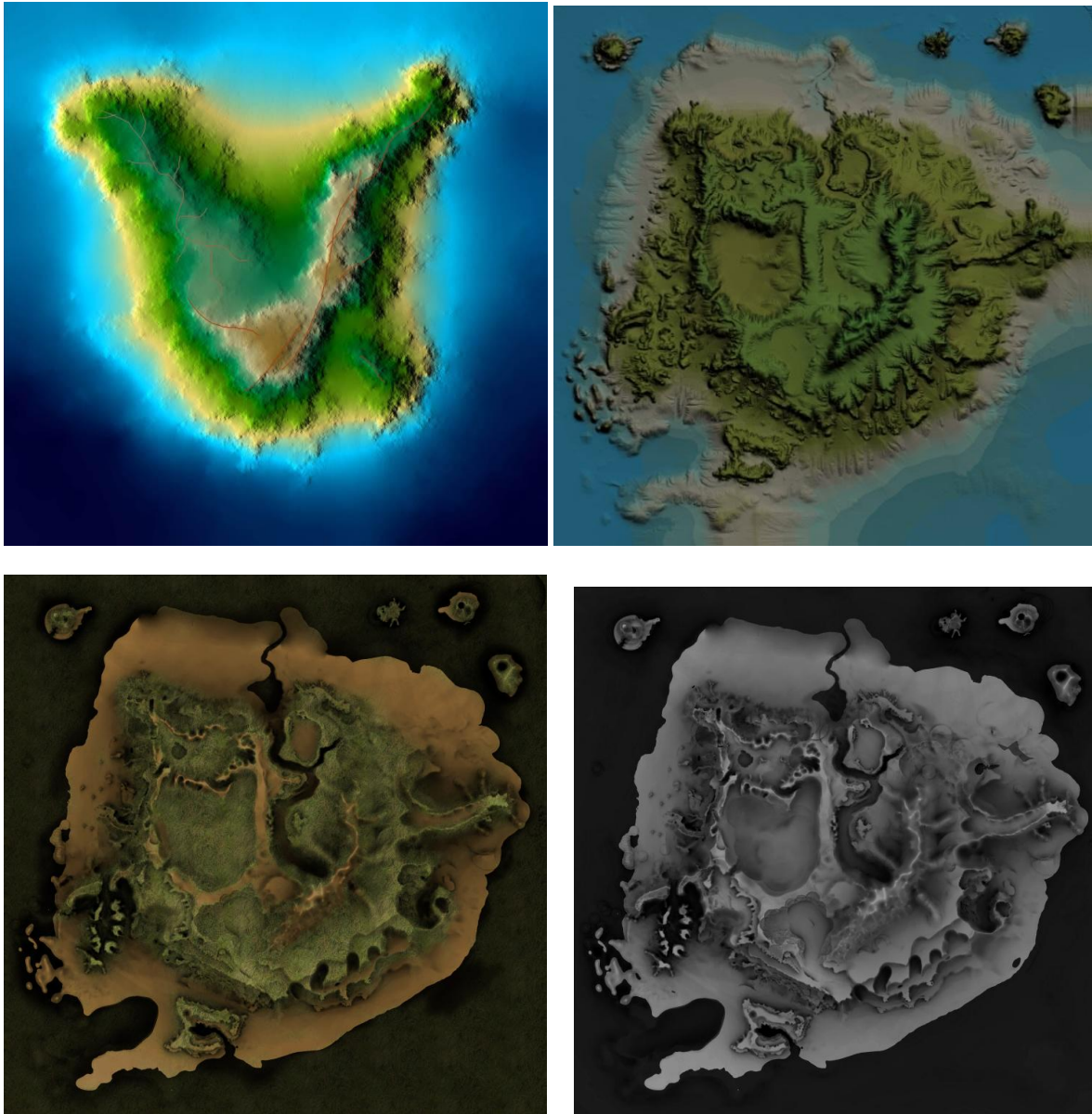
- 1) Key images from V.L research
- 2) Research & Reference phase, using Deepzoom as a tool to collate all the research & reference into one visual space: this has proven to be a very very important and pivotal step in linking R&R to the actual level when contracting it.

First steps:

- a) Using geocontrol2, generated an island terrain, imported into sandbox, not really happy, yes it' looks good (natural eroded cliffs etc..) but there is very little in the way of interesting geology to look and explore....
- b) I scrapped the use of procedural tools to build it by hand, sculpting the terrain with forms based on reference and artistic license!

Process

- 1) Block out on paper(topdown map, based from painting of the island map)
- 2) Build basic form using large brush tools in CE3 SDK, size is EVRYTHING, too many NE environments are nothing more huge boring plateau's , this is ONE ENVIRONMENT WITH many LANDSCAPES! it's boring and very very limited in terms of what actually exists out there, I resorted to a 1024x1024 pixel map with a 1m/unit setting=1 sq km, which is more than enough for a environment that can be made to be fun, interesting, mythical and incite a player to explore.
- 3) Block out key features, i.e starting from a macro level, block out the 3 or 4 major features, breaking the island into 8 zones (essentially a circle divided into 4, then subdivided into two parts each(inner circle and the out edge) gives you 8 zones to work on, which when broken down is much more feasible to imagine, reference and construct.
- 4) Refine each area with your references, for geometry this involves both creating the form (i.e sloping mountain pathway) and actual testing (can you walk up and down the path, is it easy or hard?, can you make multiple sub-routes?)
- 5) Finish geometry stage
- 6) Create the terrain texture(export large 4096x4096 or bigger preview) save this as the base template.
- 7) This is then used as a template (heightmap) for WorldMachine/Geocontrol2, the trick is not tot generate the terrain by these two tools, but to import them and use the toolset to help generate a far-LOD colour map, giving your terrain a realistic eroded terrain from a distance.
- 8) Now in Photoshop add the LOD map(ir normal map) onto your greyscale terrain texture, and start to paint in your colour layers(grass, sand, rock etc..), I tried grass, but this does not work with a grass type texture it's way to detailed to form an aerial shot(my next task was to source an aerial shot of a grassy island that I could use as the grass layer...)



So far pretty happy with the result, bit more work and this part should be done soon! A few issues with Sandbox 2:

- a) terrain tools are good, but need improving, i.e brush that can follow a shape(block or a spline) useful for carving cliffs at an angle
- b) Strange corruption of the terrain(single pixel) which destroys very finely made paths, took me around 5 hours to fix all the path I had initially created and tested meter by meter!
- c) Voxel tools, slow and fiddly, needs improvement, fantastic tool though

todo:

- 1) Voxel Caves/Tunnels, overhangs etc..
- 2) Terrain close detail textures/normal maps(i.e tafoni!)
- 3) Rock formations, generic & unique
- 4) Surface Vegetation, generic(grass, shrub, tree's)
- 5) Water(rivers, lakes etc...)
- 6) Weather and Atmospheric effects
- 7) Tweaking and playtesting....



Phase 2

Introducing my new map, 'ShadowMoss Island' in part of my PhD research on Natural Environment Design in Games..... Emphasis is on the design of the natural environment using geology, environmental psychology, landscape aesthetics, character assessments etc.. to inform a new framework....

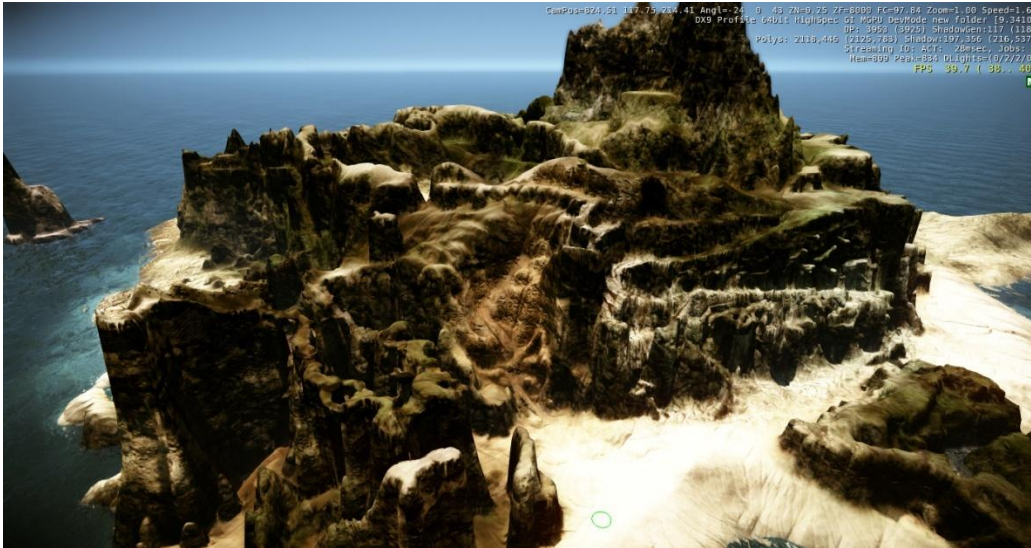
Built using a combination of hand modelling(rather than using worldmachine/geocontrol a sa start) then importing back into geocontrol/worldmachine to create the surface colour texture.....then adding aerial photo data to the hi-res terrain texture..... I really wanted an environment that reflected the complexity of a real landscape, steep narrow mountain paths, collapsed limestone caverns(caldera) that all interconnect from a forest the beach via a sea cave (the voxel tool is amazing, although does need refinement), there are multiple paths around that connect , which hopefully will entice you to explore the environment for alternative/interesting routes....

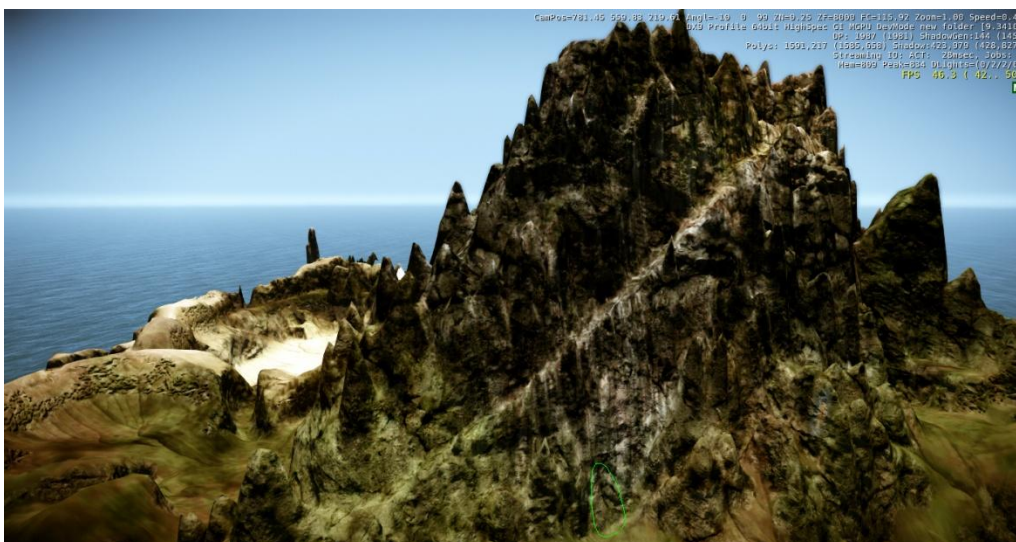
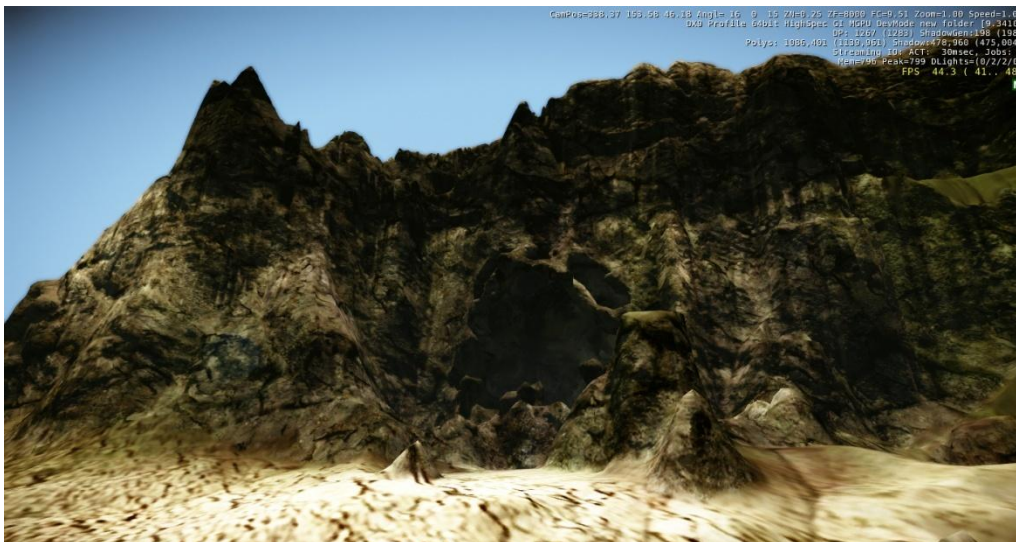
The whole island was kept small for a reason, as I know the biggest issue with natural environment design is the issue of creating huge environments that are next to impossible to finish to a good quality, the initial core are is normally great but the rest gets ignored....

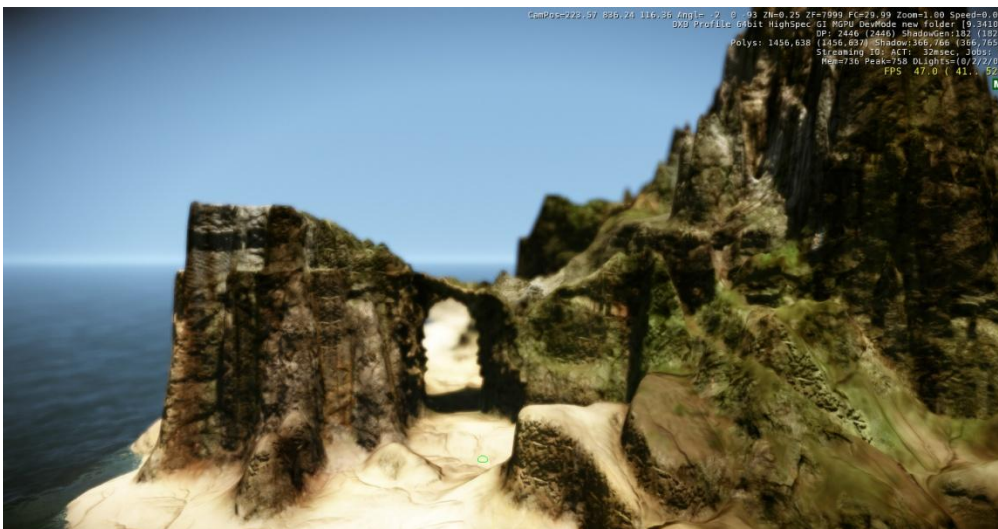
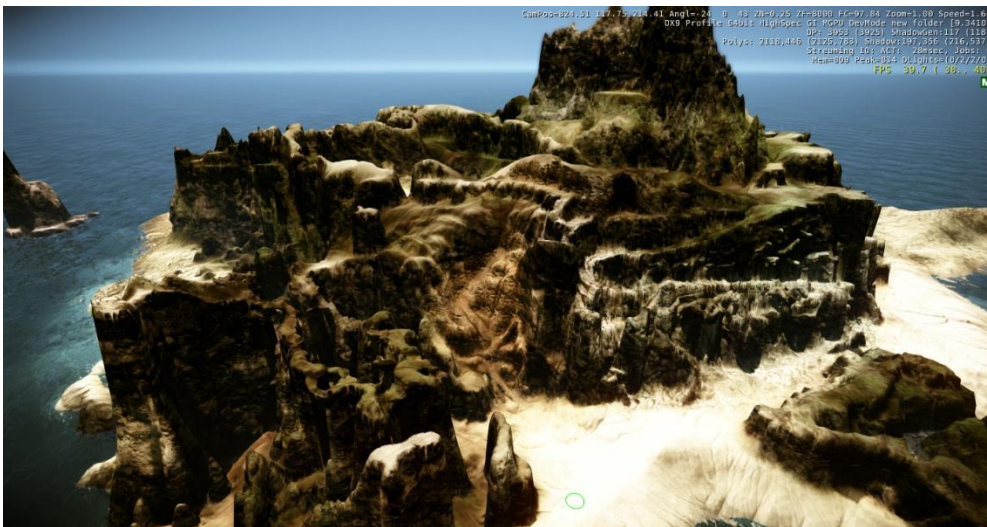
Really happy with how my vision is matching up to the actual build, big thanks to the Crydev team for making such a powerful environment toolset, and allowing free open use....

todo:, finish off terrain, add rocks/veg layer, waterfalls/rivers, atmospherics(fog, wind etc...)

todo:, finish off terrain, add rocks/veg layer, waterfalls/rivers, atmospherics(fog, wind etc...)





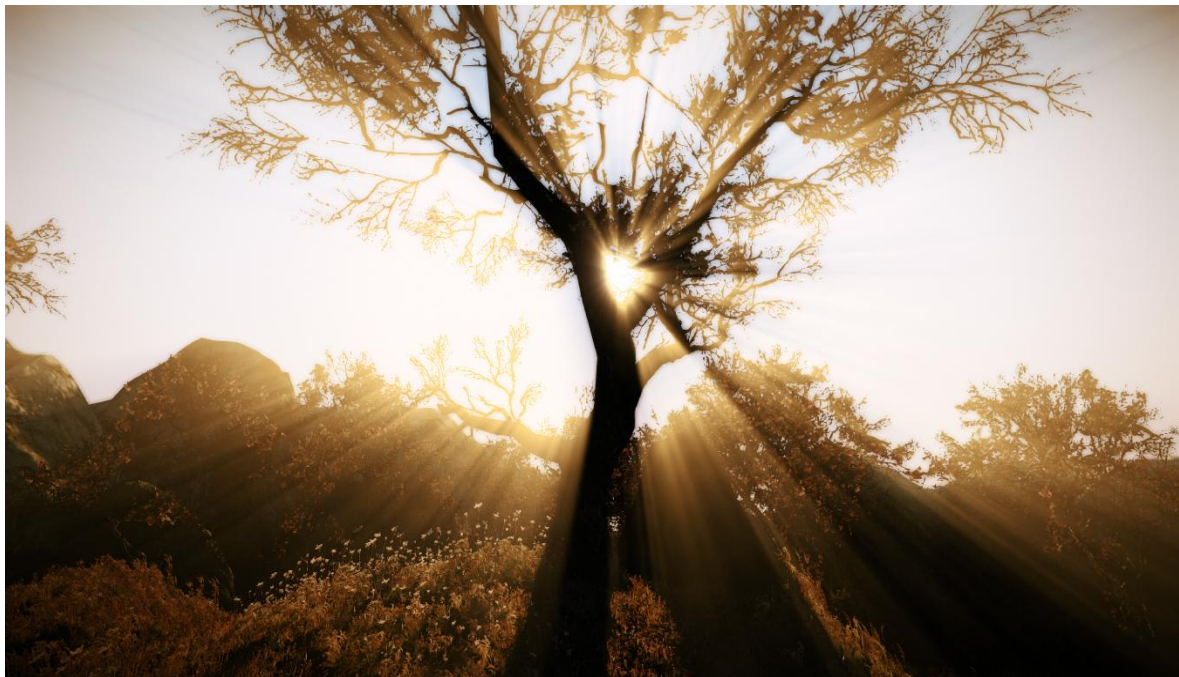




More updates to my map. During the design & production a process has emerged, this appears to be marry quite nicely with the key elements of Landscape Character Assessment, now it's a case of refining my process based on practice.

Phase 3

My project page for [ShadowMoss Island](#) is up on CryDev



Terrain & Geology

1) **Macro geology:** Archetypal landforms (i.e topical island): *this is the overall setting of the land, the high concept of your environment in which your different landscape will sit.*

2) **Sub-macro landforms:** *Broken down into 4-8 distinct landscapes, each with a defining feature (i.e salts flats, the limestone forest) these are the different sub areas that make up the landscape, if in doubt leave one or two empty or undefined, as this can allow room for design creep(feature creep:*

adding new features (landscapes) during the process of developing the other features). These sub areas should be named helping define each landscape with a sense of character and placeness

3) Large rock/geological considerations: *This involved looking at the sub areas, and questioning whether or not large hard rock features (such as a stone cliff overhang, and a huge rocky outcrop) should be added to help further define the particular landscape(i.e Thor’s Anvil)*

4) Medium sized boulders and rocks: *One of the interesting developments in this process was the realisation that the macro to micro essence of the environment, i.e repetition but with variation through scale, you see the very large rock formations/boulders, the medium size, then the small/very small, this is essentially replicated with fauna(Tree’s, bushes, plants, grass), In order to bring a sense of believability, there needs to be a transition from the large to the small, hence the medium size rock/flora, which is often left out, can be critical in creating rich landscapes*

5a) Small sized ‘scree’: *Essentially almost like vegetation, this is the small, hand/foot sized rock/pebbles etc... (is often again left out in key areas where one would expect (base of cliff/crag etc..)*

5b) Unique ‘Geomorph’ Formations: *Rocks acting as a centrepiece in a sub-macro area, which can help the player by acting as a Waypoint, I have created one such piece in ShadowMoss Island, ‘Thor’s Anvil’: A Large igneous(basalt?) type rock formation that lies in between the salt flats(I’ll think of an apt name) and the weedy meadow(to be named!)*





6a) **Generic Texture** : (essentially soil type) of the different sub-macro area's (this ties into the surface texture in CryEngine 3), this has been a huge amount of work, collating references and building up a very high resolution surface texture (16x16k), there has been a huge amount of tweaking, and in matching the available rocks/plants in the CryEngine 3 SDK to the surface texture, and the landscape types, overall very happy with the grass/flora based areas, but the bare rock areas need a lot of colour tweaking since the default rocks are limited in the range of colour palettes they cover.

6b) **'Paths'**: Adding texture to the different sub-macro area's (landscapes) to define subtle/non subtle paths within a landscape, this is for guiding the player down certain routes the designer feels he wants the player to explore (i.e. path leading to a stunning vista or to a new area)

6c) **Variation texture**: Just to add very low level (i.e. 6-8ft) patches of variation within a landscape, i.e. moss patch in a grassy meadow,



Flora

7) Grass & Scrub

- a) **Fill Low-level Flora Grass:** *This is the main fill grass/scrub that fills the area(~70% fill)*
- b) **Secondary fill(i.e brown grass) :** *Adding variation and believability this is the secondary fill flora, often a contrasting colour works well(i.e brown with green)*
- c) **Unique Low level flora:** *This is to add character to a particular area or to emphasise a certain aspect of the(i.e reeds along a river bank or grass seeding patches)*
- d) **Flowers/vibrant coloured fauna:** *to really add a sense of contrast and richness to the flora, patches of grass(can be subtle i.e daises or flowering grass) or not subtle(a meadow of bluebells can be a striking feature)*





9) **'Fill' Tree's & other large flora** *This should reflect the terrain type and the sub-area theme. The nature of the terrain (rocky, dry soils versus flooded mangrove etc...) would radically affect the type of tree's that would grow not just in the species but also the physical characteristics (i.e stunted or supporting gigantism , natural environments designers tend to favour Islands, which tend to be tropical and as a result tend to palm heavy, which really limits the range of flora and type of landscapes that can be created. In Shadowmoss Island, there is a mix of Oak(Cotton-Oak Forest) and Beech (WhiteBeech Woods) which brings a new refreshing approach to natural environments*

10) **Stumps & large decaying flora** *Where there is life once would expect the full lifecycle from birth to death, and evidence of it. In the case of woody plants(i.e tree's) one would expect to see fallen, older tree's, decaying stumps and trunks littered across the landscape.*

10) **Special 'geomorph' waypoint tree's** *Acting as a centrepiece in a sub-macro area, these coupled with geomorph geology/other flora can add a dramatic focalpoint to a sub-area helping players form mental maps of the environment with key markers(i.e Geomorph tree's in this case) acting as waypoints.*

8) **Bushes & medium sized fauna** *To provide a mid level transition flora between the low(grass) and high(tree) lines,, this should be clustered and often form around larger woody plants*



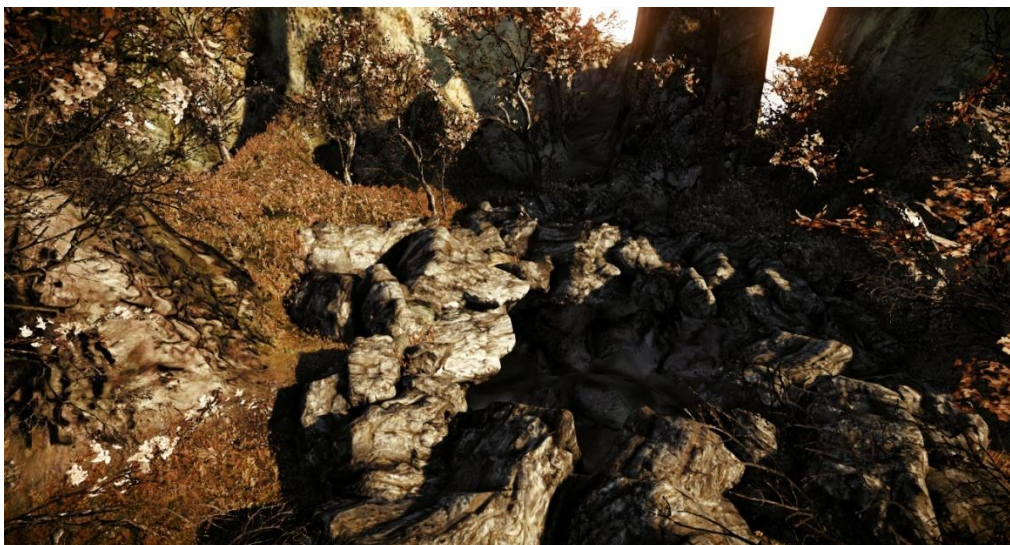


Geomorphosites

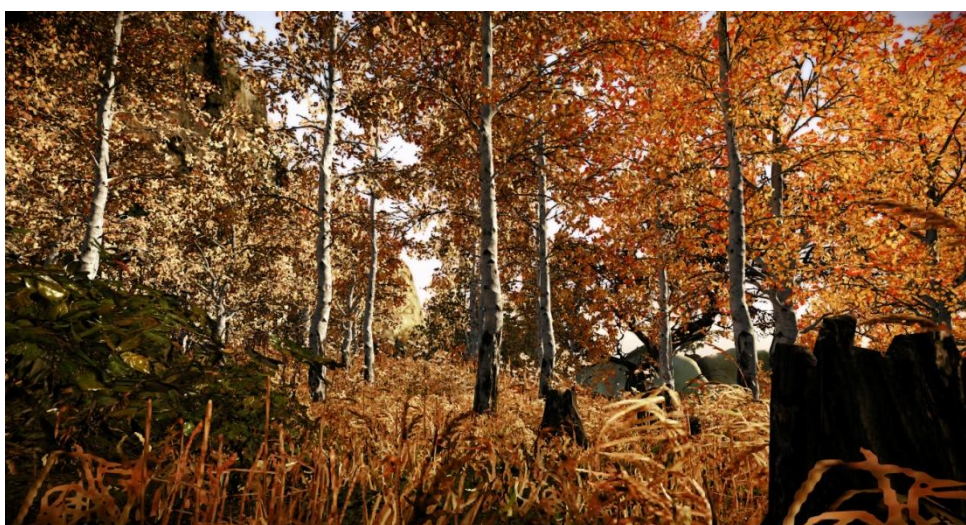
Cotton-Cavern (Limestone Cenote) Entrance

One of the features I really wanted to provide an intricate island in the sense that gullies, caves, cliffs would all interconnect, if the Island were to have Sea Caves, then it would follow these caves would interlink across the Island (depending on the underlying geology, i.e limestone) and again, believable that one of the resulting caverns would have collapsed (creating a Cenote), which would allow access to the Sea Caves from higher up in the Island.





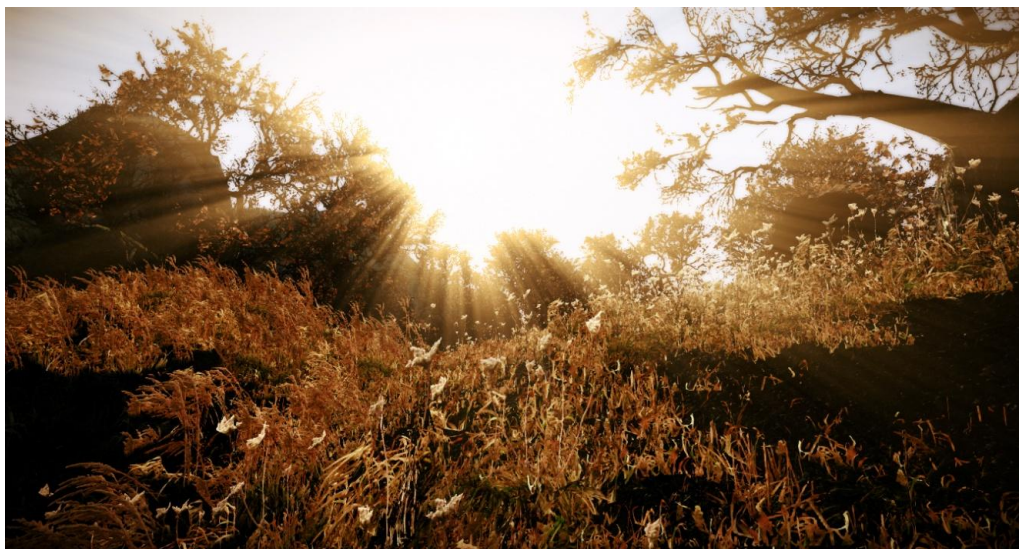
WhiteBirch Woods



Cotton-Oak Forest

Called Cotton-Oak for two reasons: a) It's full of Oak tree's(well yeah...)and secondly, the idea was to have a forest in a late autumn setting, with the differing shades of long brown grass coupled with the swirls of cottonwood fluff filling the air (inspired by driving in Manchester recently, and to work, I've become aware of the almost magical qualities of cottonwood fluff flying through the air during the early/late hours of the day, even in the middle of a very busy modern city hub environment such as MediaCity UK, it's brings a real natural quality to the landscape, and often made me smile during a long drive). During my quick research of cottonwood I came across this (<http://www.youtube.com/watch?v=YmpeUPD5FUU>) and maybe this would form an interesting natural phenomena, can cottonwood fluff patches ignite spontaneously? If so, what would this look like? (Imagine a fire sweeping through a forest and forcing a player into a Cenote to seek refuse...hmmmm)





Boulder Pass

Perched high in the Cliffs of Shadowmoss Island, a beautiful pristine lush oak forest awaits those who are able to hike up, a narrow opening between two ancient boulders heralds the way to spectacular views of the calming ocean below

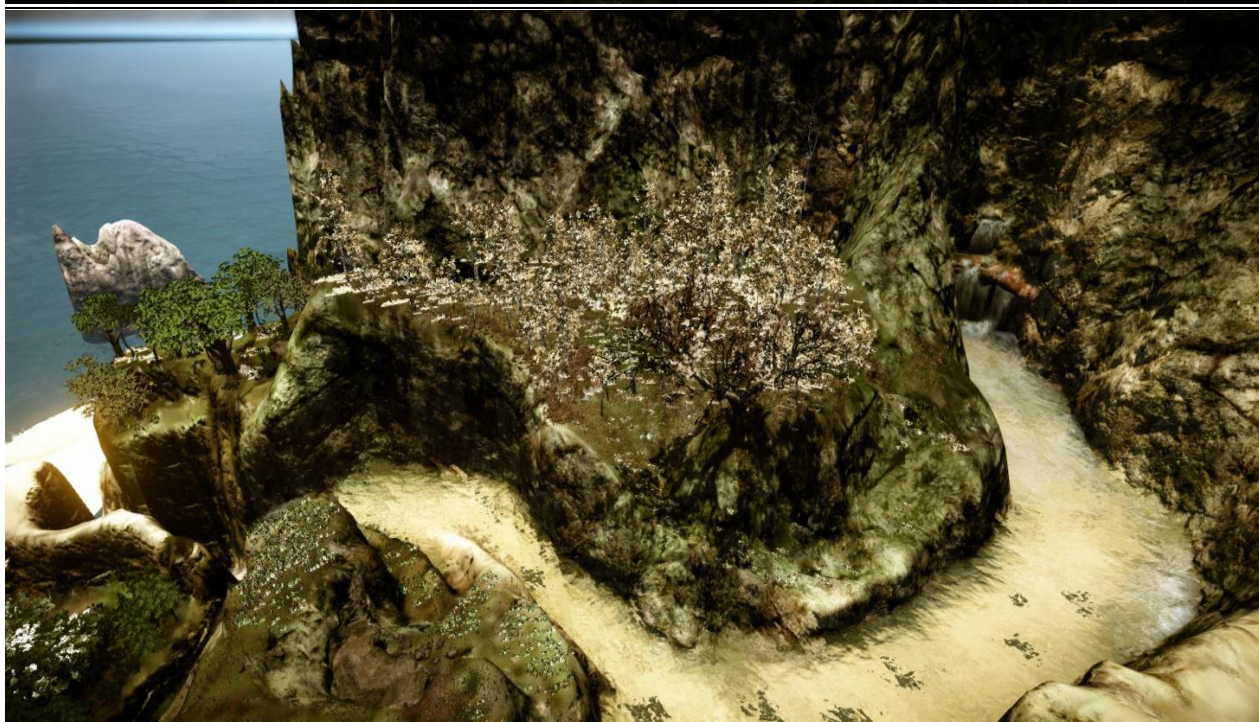




LightCave Falls/River

Lightcave Falls marks where the vast network of waterways from the LostPeaks converge and pour melted freshwater from the snowy mountain peaks. The Falls also mask the entrance the vast underground network of limestone caverns that stretch the entire length and depth of the island, legend has it that it was once home to a mysterious tribal community now long gone, but remnants of their culture and knowledge remain locked away in caverns deep below the surface.





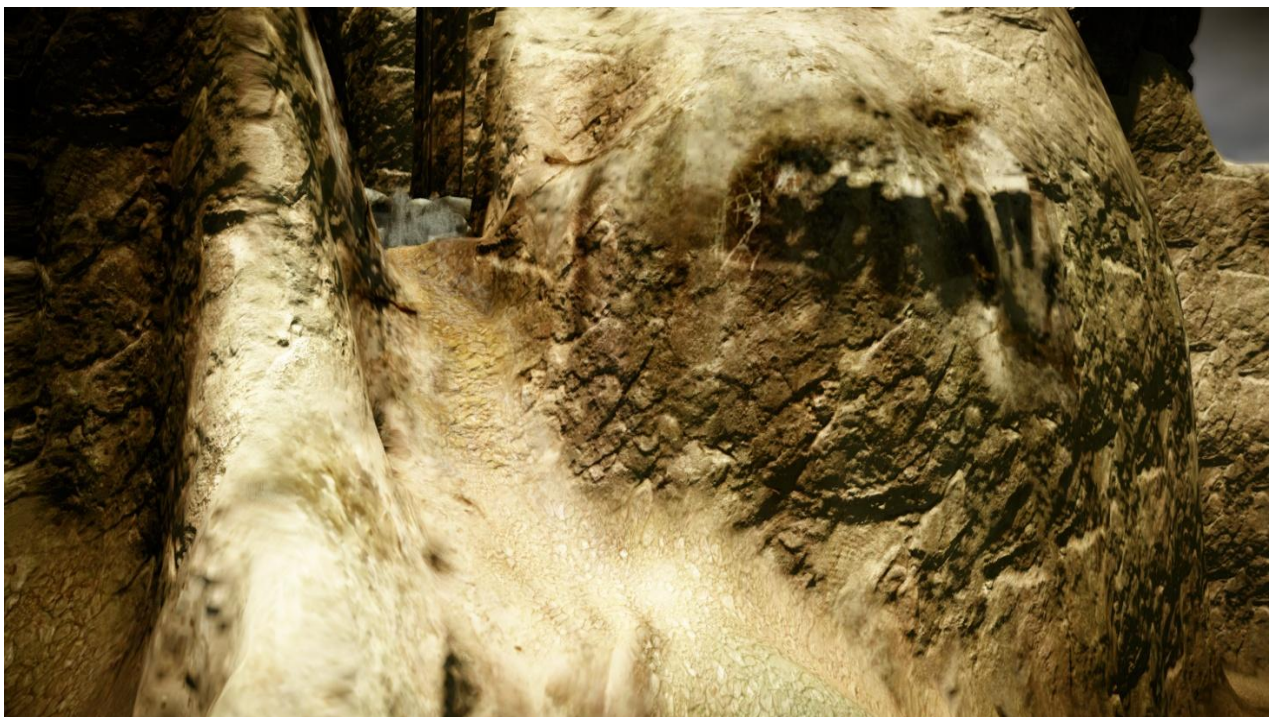
DarkCave Falls

The Dark Cave falls are a short distance downstream from the LightFall caves, named due to the rapid fall into darkness once would experience if you ever misjudge these rapids, and for the remains of countless individuals whose bones scatter the interior of the Darkcave, lost to some ancient dark ritual.



Deathslip Brook

You'll never live to talk about the Deathslip brook if you ever encounter it first hand, those who do are often a warning to others, what appears to be a shallow brook running off from the deathfalls, quickly leads to a sheer drop off a mountainside, if you slip here, death is right behind you.



Devils Staircase



Dragon Tongue Slope

An ancient landslide centuries ago is still evident, marking the terrain in a unique manner, the area is known for its deposits of rare minthrilite and ObsidianGold.





DragonBone Cliffs

The Dragonbone Cliffs are a remarkable natural phenomena, the unique limestone cliffs eroded by the elements over hundreds of years have left what appears to be the remnants of dragon bones arching over the cliffs,



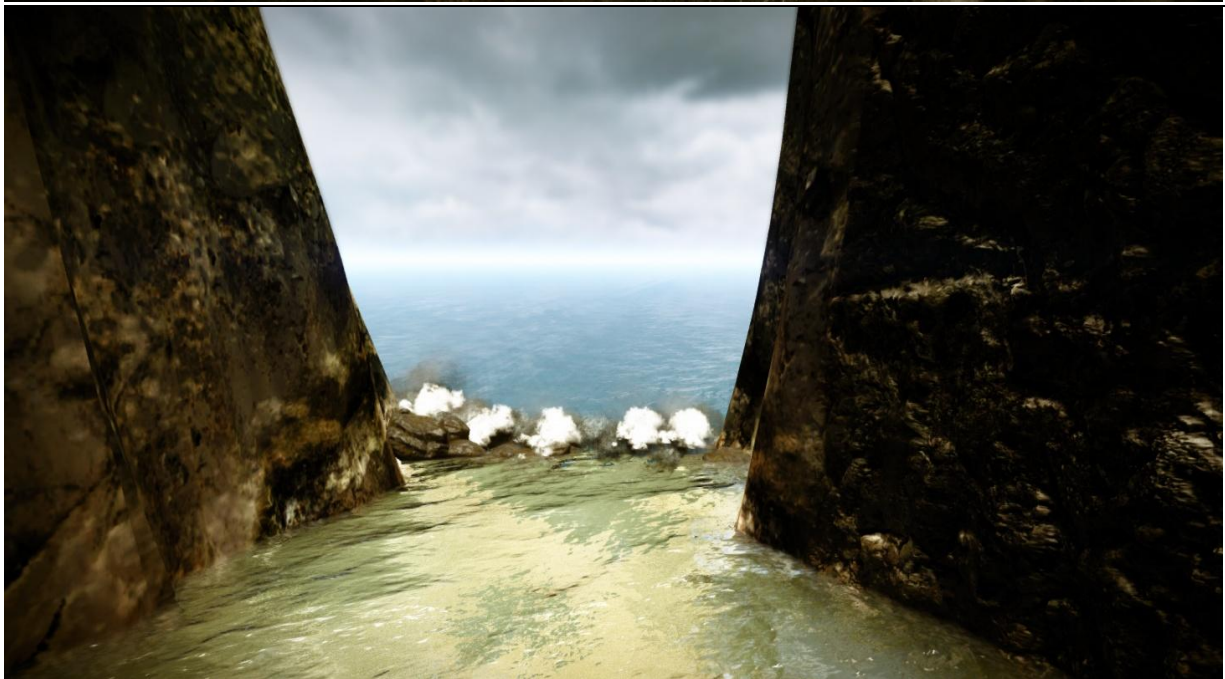
DragonMouth Overlook

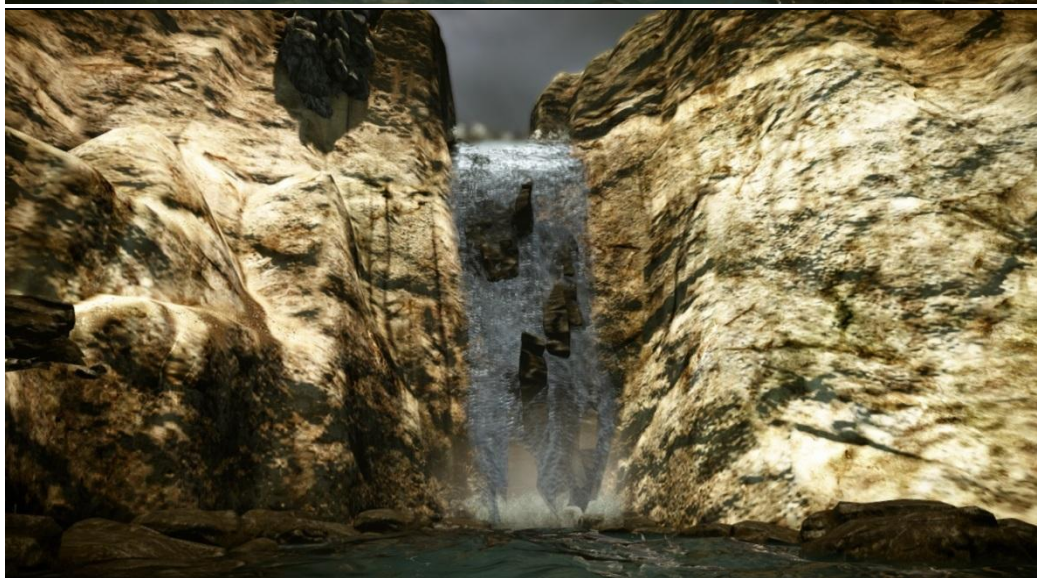
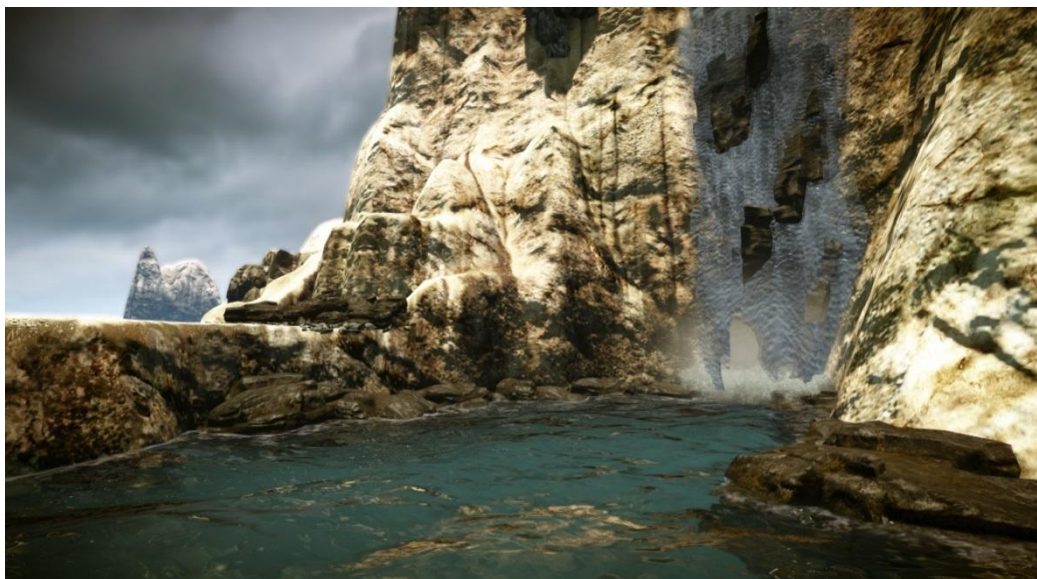
Nestled quietly above OakHill Shallow, Dragonmouth Overlook, offers a stunning vista and overview of the entire west side of Shadowmoss Island, noted for the difficulty to find it, and the protection it offers, the overlook has been used for centuries as a outpost that affords protection, shelter and defence.



Gambit Falls

The stunning gambit falls are found at the end of the main river that flows from the LostPeak mountains. A sheer precipice marks the end of the river, and a beautiful exhilarating drop awaits into Lost memory lake, the question is will you become nothing more than lost memory if you place a gambit on the falls.





Inland Isle

A strange island with and island, the Inland Isle is said to hold a lost treasure, only to be found by anyone who is able to decipher the space within a space



Lost Hope Peak/Trail

If one survives the long hike up the lost peak trail, you will eventually find the Lost Peak, here the entire island can be seen in all its glory, however a strange tragic, sombre mood often passes over those who stand at the peak, those who have stood there have warned and a strong urge to leap from the peak takes hold, the peak is eerily silent bar from whisperings that can be heard from time to time.





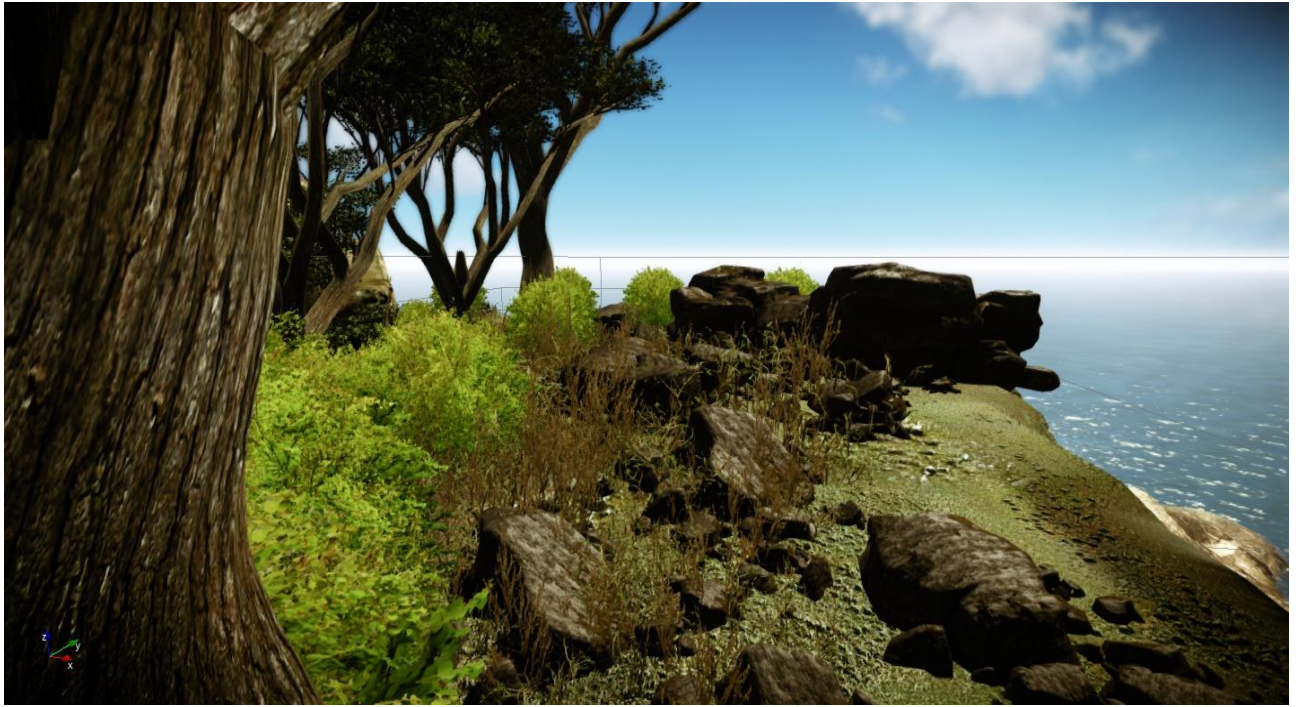
Lost Memory Lake

A treasure trove lies at the bottom of lost memory lake, a plunge pool that lies at the bottom of gambit falls however the excitement of finding treasure suddenly wains when the grim realisation sets in; these are often the belongings of those who have jumped/fallen from Gambit falls above, treasure awaits those brave enough to dive deep into the bottom of the lake, but legends have it those venture near the falls at night hear the lament of a drowned women –who was drowned by a malevolent ancient spirit that haunted the pool , whose who do get to close at dusk risk joining those who are forever tormented below the beautiful green waters of the lake.



OakHill Shallow

Quietly nestled at the north of ShadowMoss Island, the OakHill Shallow is a tranquil natural depression in the ground that has given rise to a lush habitat.





OgreShelf Cliffs

A series of partially collapsed rock faces, the OgreShelf Cliffs are a fascinating natural phenomena, where one can literally jump down the mountain side using the Ogreshelves





Skullrock Cave

The beaches of ShadowMoss Iland are scattered with the entrances to various cave systems that connect the upper areas of the island to the shores. One cave entrance in particular seldom forgotten when encountered, what appears to be a giant skull marks the entrance to a complex limestone cavern system that connects a limestone ceyote at above the island to the beach below.



Sleepy Hollow

The hollow is a strange place, the result of gasses leaking from mineral deposits coupled with a build up acidic water from the surrounding rock make the hollow an unassuming deathtrap, animals, people who enter the hollow are hit with a sudden waver of tiredness, and the temptation to rest for a few minutes is often the last mistake they will ever make, for once you sleep, you sleep for eternity. For those who manage to venture into the very heart of the hollow, death is even more rapid, marksy grasses conceal a deep pool festering with the remains of animals and those all those who eventually are pulled into the watery grave.





StoneChisel Trail

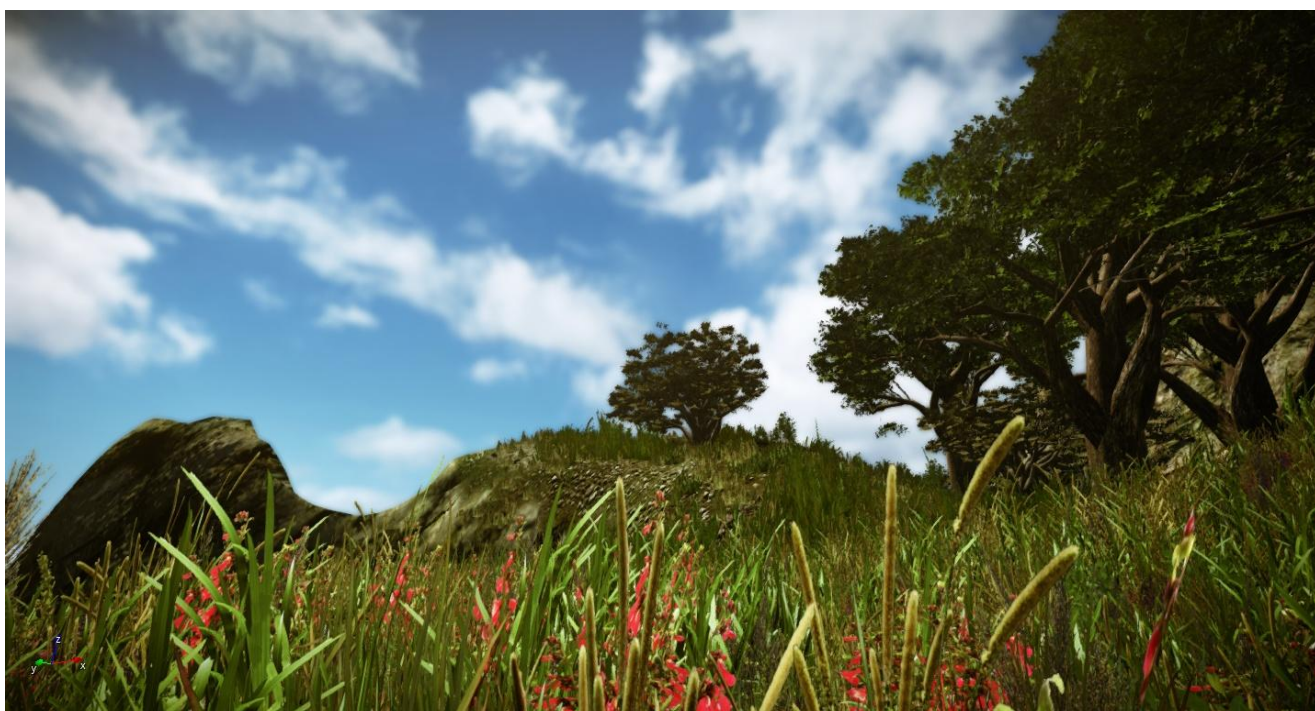
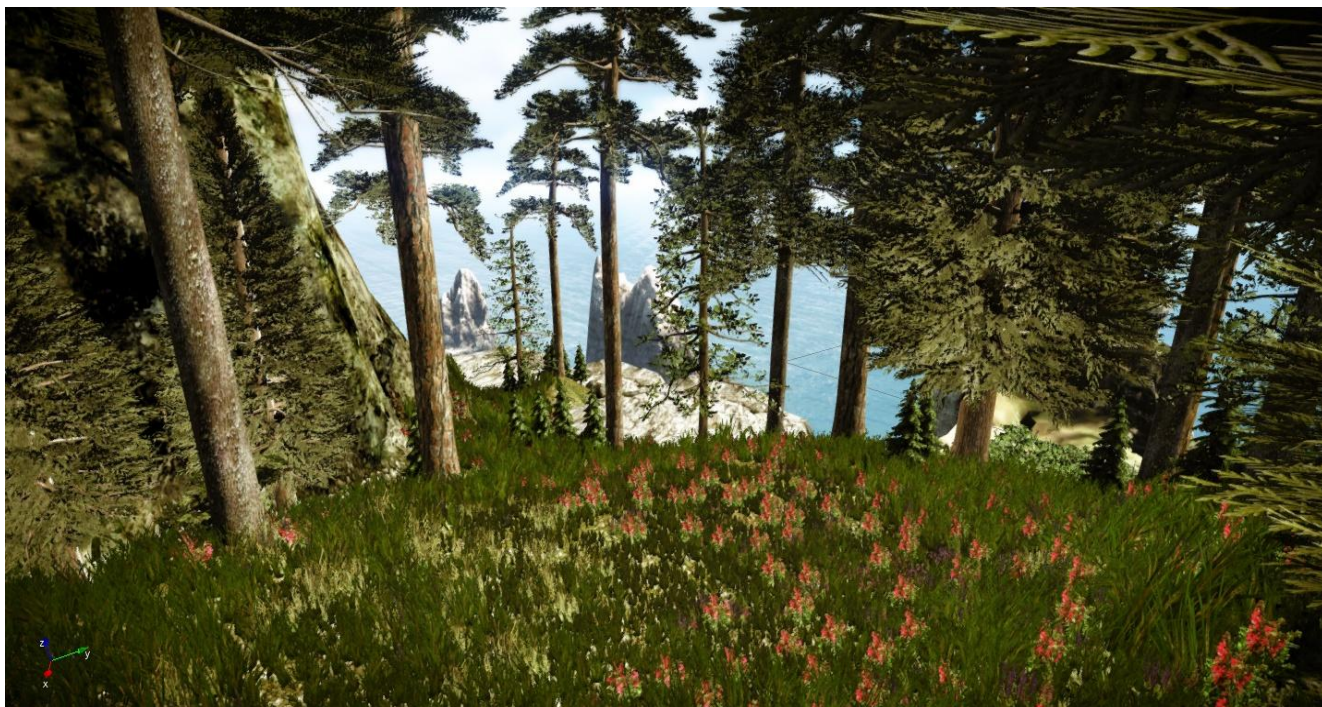
A sheer rockface comprised of a mix of chalk and slate, the trail appears to be a trail used to transport something precious from the shore to the mountain face or vice versa. The trail hugs the sheer rockface and on closer inspection, chiselling and tool marks are evident along the rockface.



TallPine Cliffs

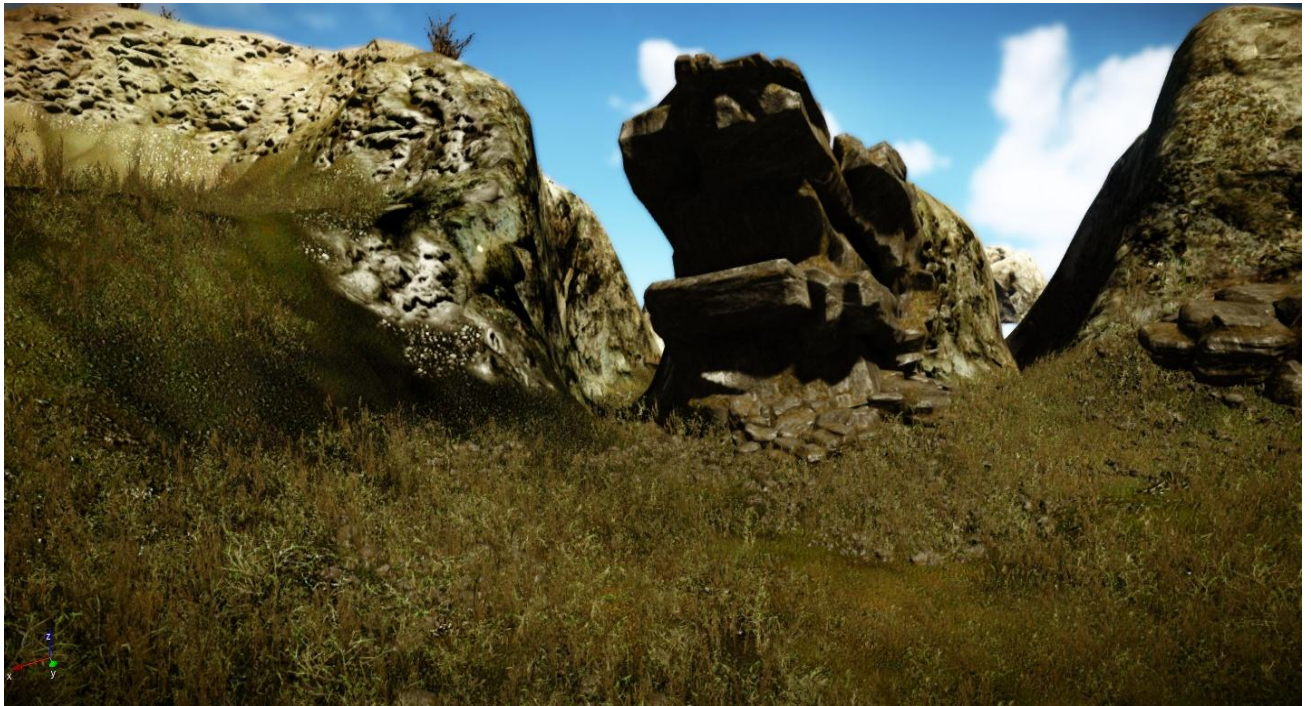
A forest of unnaturally tall pines can be found on the sheer south east side of the Island. The combination of shelter, good amount of sunlight coupled with clean freshwater has made this a lush, idyllic green forest, scattered with redbells a rare variety of bluebells, renowned for their unique medicinal properties that only grow in this area of the island.





Thors Anvil

Many know of the legend that concerned race of warriors who once existed in times long past and that a mighty weapon, a hammer was created, wielded by Thor, many do not know that a hammer is often coupled with its counterpart' the anvil, and Thor's anvil can be found on Shadow Moss Island, the anvil stands in between the east and west regions and the light during sunset sets perfectly in line with the anvil, legend has it a weapon struck at a particular moment will inherit Mjolnir power.



Titans Archway

A huge archway greets those who explore the shore of Shadowmoss island. The majority of the cliff has crumbled leaving a precarious thin sliver of rock connecting the island to a lone tree that sits atop of the archway. It has been said that the archway was not a natural occurrence since a long rock outcrop sits perfectly aligned through the archway some distance away, does this archway hold some ritualistic significance?



Appendix O: ShadowMoss Island Production Report 3: Embedded Genius Loci



Image: ShadowMoss Island Genius Loci Map

Area	Reference	Genius Loci (Spirit)	Description
1.	Cotton-Cavern (Limestone Cenote)	Peaceful, intrigue	One of the features I really wanted to provide an intricate island in the sense that gullies, caves, cliffs would all interconnect, if the Island were to have Sea Caves, then it would follow these caves would interlink across the Island (depending on the underlying geology, i.e limestone) and again, believable that one of the resulting caverns would have collapsed (creating a Cenote), which would allow access to the Sea Caves from higher up in the Island
2.	Lost Memory lake	Mysterious,	A treasure trove lies at the bottom of lost memory lake, a plunge pool that lies at the bottom of gambit falls however the excitement of finding treasure suddenly wains when the grim realisation sets in; these are often the belongings of those who have jumped/fallen from Gambit falls above, treasure awaits those brave enough to dive deep into the bottom of the lake, but legends have it those venture near the falls at night hear the lament of a drowned women –who was drowned by a malevolent ancient spirit that haunted the pool, whose who do get to close at dusk risk joining those who are forever tormented below the beautiful green waters of the lake.
3.	Gambit Falls	Peril/Danger, Excitement	The stunning gambit falls are found at the end of the main river that flows from the LostPeak mountains. A sheer precipice marks the end of the of the river, and a beautiful exhilarating drop awaits into Lost memory lake, the question is will you become nothing more than lost memory if you place a gambit on the falls.
4.	OakHill Shallow	Tranquil	Quietly nestled at the north of ShadowMoss Island, the OakHill Shallow is a tranquil natural depression in the ground that has given rise to a lush habitat.
5.	Deathslip Brook	Peril, Danger	You'll never live to talk about the Deathslip brook if you ever encounter it first hand, those who do are often a warning to others, what appears to be a shallow brook running off from the deathfalls, quickly leads to a sheer drop off a mountainside, if you slip here, death is right behind you.
6.	DarkCave Falls	Danger, Mysterious	The Dark Cave falls are a short distance downstream from the LightFall caves, named due to the rapid fall into darkness once would experience if you ever misjudge these rapids, and for the remains of countless individuals whose bones scatter the interior of the Darkcave, lost to some ancient dark ritual.
7.	WhiteBirch Woods	Serene, Eerie	A beautiful birch forest that forever sits in autumn splendour, the forest is eerily quiet at times, and faint whispers give rise to rumours of a lost artefact that once ruled a splendid lost kingdom
8.	Titans Archway	Grand, awe inspiring	A huge archway greets those who explore the shore of Shadowmoss island. The majority of the cliff has crumbled leaving a precarious thin sliver of rock connecting the island to a lone tree that sits atop of the archway. It has been said that the archway was not a natural occurrence since a long rock outcrop sits perfectly aligned through the archway some distance away, does this archway hold some ritualistic significance?
9.	LightCave Falls/River	Fun, lush	Lightcave Falls marks where the vast network of waterways from the LostPeaks converge and pour melted freshwater from the snowy mountain peaks. The Falls also mask the entrance the vast underground network of limestone caverns that stretch the entire length and depth of the island, legend has it that it was once

			home to a mysterious tribal community now long gone, but remnants of their culture and knowledge remain locked away in caverns deep below the surface.
10.	Devils Staircase		
11.	DragonMouth Overlook	Prospect/Refuge	Nestled quietly above OakHill Shallow, Dragonmouth Overlook, offers a stunning vista and overview of the entire west side of Shadowmoss Island, noted for the difficulty to find it, and the protection it offers, the overlook has been used for centuries as a outpost that affords protection, shelter and defence.
12.	Lost Hope Peak/Trail	Glorious, spectacular	If one survives the long hike up the lost peak trail, you will eventually find the Lost Peak, here the entire island can be seen in all its glory, however a strange tragic, sombre mood often passes over those who stand at the peak, those who have stood there have warned and a strong urge to leap from the peak takes hold, the peak is eerily silent bar from whisperings that can be heard from time to time
13.	DragonBone Cliffs	Mysterious,	The Dragonbone Cliffs are a remarkable natural phenomena, the unique limestone cliffs eroded by the elements over hundreds of years have left what appears to be the remnants of dragon bones arching over the cliffs.
14.	Boulder Pass	Refuge, Safety, mysterious	Perched high in the Cliffs of Shadowmoss Island, a beautiful pristine lush oak forest awaits those who are able to hike up, a narrow opening between two ancient boulders heralds the way to spectacular views of the calming ocean below
15.	Inland Isle	Mysterious	A strange island with and island, the Inland Isle is said to hold a lost treasure, only to be found by anyone who is able to decipher the space within a space
16.	StoneChisel Trail	Precarious, nerve wrecking	A sheer rockface comprised of a mix of chalk and slate, the trail appears to be a trail used to transport something precious from the shore to the mountain face or vice versa. The trail hugs the sheer rockface and on closer inspection, chiselling and tool marks are evident along the rockface.
17.	Dragon Tongue Slope	Unusual,	An ancient landslide centuries ago is still evident, marking the terrain in a unique manner, the area is known for its deposits of rare minthrilite and ObsidianGold.
18.	Sleepy Hollow	Peril, danger, haunting	The hollow is a strange place, the result of gasses leaking from mineral deposits coupled with a build up acidic water from the surrounding rock make the hollow an unassuming deathtrap, animals, people who enter the hollow are hit with a sudden waver of tiredness, and the temptation to rest for a few minutes is often the last mistake they will ever make, for once you sleep, you sleep for eternity. For those who manage to venture into the very heart of the hollow, death is even more rapid, marksy grasses conceal a deep pool festering with the remains of animals and those all those who eventually are pulled into the watery grave.
19.	Pitweed Place	Grotesque, uncomfortable	The pitweeds are an awful stench ridden place where little grows apart from the foul pitweed and bramble, and not just regular pitweed, but a variety which can grow up to 6ft in height, anyone who is unfortunate to walk through there often emerges, stinking of rotten decay and most probably is cut, scratched and pricked from head to foot.
20.	Skullrock Cave	Mystery	The beaches of ShadowMoss Island are scattered with the entrances to various cave systems that connect the upper areas of the island to the shores. One cave entrance in particular seldom forgotten when encountered, what appears to be a giant skull marks the entrance to a complex limestone cavern system that connects a limestone ceyote at above the island to the beach below.
21.	TallPine Cliffs	Calming, serene	A forest of unnaturally tall pines can be found on the sheer south east side of the Island. The combination of shelter, good amount of sunlight coupled with clean freshwater has made this a lush, idyllic green forest,

			scattered with redbells a rare variety of bluebells, renowned for their unique medicinal properties that only grow in this area of the island.
22.	Thors Anvil	Grand, intimidating	Many know of the legend that concerned race of warriors who once existed in times long past and that a mighty weapon, a hammer was created, wielded by Thor, many do not know that a hammer is often coupled with its counterpart’ the anvil, and Thor’s anvil can be found on Shadow Moss Island, the anvil stands in between the east and west regions and the light during sunset sets perfectly in line with the anvil, legend has it a weapon struck at a particular moment will inherit Mjolinir power.
23.	OgreShelf Cliffs	Unusual	A series of partially collapsed rock faces, the OgreShelf Cliffs are a fascinating natural phenomena, where one can literally jump down the mountain side using the Ogreshelves
24.	Cotton-Oak Forest		

Step/Area	Actions/Implementations
1) Selection of virtual ‘place’ to act as a foundation for the design; high aesthetic concept	
2) Landscape design element 1: Physical is driven by LCA process a. Moel Siabod experience becomes source to process by observation b. Virtual Landscape Project VNED Summary v1	VNED Grid to be filled in for Shadowmoss Island
3) Landscape design element 2: Psychological is driven by a combination of the following: a. Ruskin’s <i>Go To nature</i> dictum i. Moel Siabod experience becomes source to process based on imagination/feeling	<ul style="list-style-type: none"> • Implementation of paths(multiple paths to locations) • Implementation of interconnected nature (caves) • Implementation of natural phenomena (ceyote) • Implementation of differential movement speeds(running, walking, inching forward)
b. Cognitive spatial mapping (based my moel siabod/reflection on games)	<ul style="list-style-type: none"> • Implementation of Geomorphosites along regular cyclic paths
c. Relph’s concept of Place & Placenessness	<ul style="list-style-type: none"> • Avoidance of Golf Course Design
d. Genius Loci-Each place has a unique guiding spirit	<ul style="list-style-type: none"> • Concept map to include regions • Each region to be assigned a mood/spirit

Appendix P: Refined Virtual Landscape Design process

Pre-Production: Contextual Reference		
Area/Phase	Number	Guidance Notes
A. Inspiration/Observation	1	Research & Reference phase, using Deepzoom as a tool to collate all the research & reference into one visual space: this has proven to be a very very important and pivotal step in linking R&R to the actual level when contracting it.
B. Collation	2	
C. Synthesisation	3	
D. Categorisation	4	
E. Organisation	5	

Pre-Production: Design		
Area/Phase	Number	Guidance Notes
A)	1	
B)	2	
C)	3	
D)	4	
E)	5	

Production		
Area/Phase	Number	Guidance Notes
A. Terrain Modelling		
	1	Macro geology: Archetypal landforms (i.e topical island): <i>this is the overall setting of the land, the high concept of your environment in which your different landscape will sit.</i>
	2	Sub-macro landforms: <i>Broken down into 4-8 distinct landscapes, each with a defining feature (i.e salts flats, the limestone forest) these are the different sub areas that make up the landscape, if in doubt leave one or two empty or undefined, as this can allow room for design creep(feature creep: adding new features (landscapes) during the process of developing the other features). These sub areas should be named helping define each landscape with a sense of character and placenesss</i>
	3	Large rock/geological considerations: <i>This involved looking at the sub areas, and questioning whether or not large hard rock features (such as a stone cliff overhang, and a huge rocky outcrop) should be added to help further define the particular landscape(i.e Thor’s Anvil)</i>
	4	Medium sized boulders and rocks: <i>One of the interesting developments in this process was the realisation that the macro to micro essence of the environment, i.e repetition but with variation through scale, you see the very large rock formations/boulders, the medium size, then the small/very small, this is essentially replicated with fauna(Tree’s, bushes, plants, grass), In order to bring a sense of believability, there needs to be a transition from the large to the small, hence the medium size rock/flora, which is often left out, can be critical is creating rich landscapes</i>
	5	a) Small sized ‘scree’: <i>Essentially almost like vegetation, this is the small, hand/foot sized rock/pebbles etc... (is often again left out in key areas where one would expect (base of cliff/crag etc..)</i> b) Unique ‘Geomorph’ Formations: <i>Rocks acting as a centrepiece in a sub-macro area, which can help the player by acting as a Waypoint, I have created one such piece in ShadowMoss Island, ‘Thor’s Anvil’: A Large igneous(basalt?) type rock formation that lies in between the salt flats(I’ll think of an apt name) and the weedy meadow(to be named!)</i>
B. Surface Pattern & Texturing		
	6	a) Generic Texture : <i>(essentially soil type) of the different sub-macro area’s(this ties into the surface texture in CryEngine 3), this has been a huge amount of work, collating references and building up a very high resolution surface texture(16x16k), there has been a huge amount of tweaking, and in matching the available rocks/plants in the CryEngine 3 SDK to the surface texture , and the landscape types, overall very happy with the grass/flora based areas, but the bare rock areas need alot of colour tweaking since the default rocks are limited in the range of colour palettes they cover.</i> b) ‘Paths’: <i>Adding texture to the different sub-macro area’s(landscapes) to define subtle/non subtle paths within a landscape, this is for guiding the player down certain routes the designer feels he wants the player to explore(i.e path leading to a stunning vista or to a new area)</i> c) Variation texture: <i>Just to add very low level(i.e 6-8ft) patches of variation within a landscape, i.e moss patch in a grassy meadow</i>
C. Flora: Grass & Scrub		
	7	a) Fill Low-level Flora Grass: <i>This is the main fill grass/scrub that fills the area(~70% fill)</i> b) Secondary fill(i.e brown grass) : <i>Adding variation and believability this is the secondary fill flora, often a contrasting colour works well(i.e brown with green)</i>

		c) Unique Low level flora: <i>This is to add character to a particular area or to emphasise a certain aspect of the(i.e reeds along a river bank or grass seeding patches)</i>
		d) Flowers/vibrant coloured fauna: <i>to really add a sense of contrast and richness to the flora, patches of grass(can be subtle i.e daises or flowering grass) or not subtle(a meadow of bluebells can be a striking feature)</i>
	8	a) 'Fill' Tree's & other large flora <i>This should reflect the terrain type and the sub-area theme. The nature of the terrain(rocky, dry soils versus flooded mangrove etc...) would radically affect the type of tree's that would grow not just in the species but also the physical characteristics (i.e stunted or supporting gigantism , natural environments designers tend to favour Islands, which tend to be tropical and as a result tend to palm heavy, which really limits the range of flora and type of landscapes that can be created. In Shadowmoss Island, there is a mix of Oak(Cotton-Oak Forest) and Beech (WhiteBeech Woods) which brings a new refreshing approach to natural environments</i>
	9	Stumps & large decaying flora <i>Where there is life once would expect the full lifecycle from birth to death, and evidence of it. In the case of woody plants(i.e tree's) one would expect to see fallen, older tree's, decaying stumps and trunks littered across the landscape.</i>
	10	Special 'geomorph' waypoint tree's <i>Acting as a centrepiece in a sub-macro area, these coupled with geomorph geology/other flora can add a dramatic focal point to a sub-area helping players form mental maps of the environment with key markers(i.e Geomorph tree's in this case) acting as waypoints.</i>
	11	Bushes & medium sized fauna <i>To provide a mid level transition flora between the low(grass) and high(tree) lines,, this should be clustered and often form around larger woody plants</i>
D. Geomorphosites		
	12	a) Geomorphosite Locations <i>One of the features I really wanted to provide an intricate island in the sense that gullies, caves, cliffs would all interconnect, if the Island were to have Sea Caves, then it would follow these caves would interlink across the Island(depending on the underlying geology, i.e limestone) and again, believable that one of the resulting caverns would have collapsed (creating a Cenote), which would allow access to the Sea Caves from higher up in the Island</i>
E. Lighting & Shade		
	13	<i>This should reflect the different moods the game is trying to portray, you need to think about areas of strong light and shade that are relatively fixed, as well as areas that undergo transitions. Use several types of lighting including sunlight, reflected and direct, as well as phoneme such as un patches, or areas where the clouds may create dark cloud patches.</i>
F. Weather/Climate		
	14	a) <i>Consider standard patterns of weather, include unusual mix of weather system (i.e bright day with rain)</i>
		b) <i>Consider standard patterns of climate(where is the game based, alien or real, climate will influence flora and fauna)</i>
		c) <i>Consider standard patterns of season, (seasons will affect the weather patterns, create a system for</i>
G. Hydrology & Water Bodies		
	15	<i>Add lakes, rivers, stream, puddles, shores, marshes and a variety of water bodies.Colour can be used to change the way the water is perceived, as well as flow rate and depth. This can also be used to indicate locations(i.e following a river)</i>
H. Time Depth		
	16	<i>Add evidence of erosion or time to the landscapes, this can be fossils, or through erosion(water weathering) etc...</i>

Appendix Q: VNED-LCA Design Grid V2

Area	Perceptual Considerations(<i>missing Smell & sound as too extensive</i>)		
	Sensory: Visual	Psychological	Sensory: Agency(tacit or otherwise)
A) Physiographic Character	1. Aesthetics 5. Colour 6. Texture 7. Pattern 8. Form	1) Psychological d) Memories e) Associations f) Preferences ○ Personal space and territoriality ○ Habitat Selection ○ Affordance ○ Greenbie's Placenessness ○ Landscape Aesthetics	
Geology			
a) Fluvial b) Drift c) Tertiary & Mesozoic d) Upper Palaeozoic e) Caledonian			
Landform			
a) Vales & Valley Floors b) Rolling Lowland c) Upstanding d) Sloping e) High Land			
Soils			

<ul style="list-style-type: none"> a) Deep Soils b) Shallow Soils c) Impoverished Soils d) Gleyed Soils e) Bog/Fen Peat 			Movement Speed/impact on health
B) Cultural Character			
Land Use			
<ul style="list-style-type: none"> a) Urban b) Arable Farmland c) Pastoral Farmland d) Rough Land e) Woodland 			
Settlement			
<ul style="list-style-type: none"> a) Urban b) Clustered c) Dispersed d) Coalfields e) Planned f) Unsettled 			
Enclosure			
C) Surface Cover			
Tree Cover			
<ul style="list-style-type: none"> a) Unwooded b) Other Trees c) Coverts & Tree Groups d) Estate Plantations e) Secondary f) Ancient Woods 			Seasonal Change, auto Falling down(rotten roots)
Flora & Fauna			
<ul style="list-style-type: none"> a) Flora b) Fauna 			Movement, alpha maps,
D) Environmental			

Conditions			
Weather			
Climate			
Season			
E) Hydrology & Water Bodies			
Water Bodies			
F) Distinctive Features			
Geomorphosites			

Appendix R: Biophilic Design for Virtual Landscapes

Biophilic Design Category	Sub Category	Virtual Landscape Design Considerations/Notes	ShadowMoss Island Implementation
Nature in the space	1. Visual Connection with Nature. A view to elements of nature, living systems and natural processes.	<i>Applicable</i> <ul style="list-style-type: none"> Natural flow of a body of water Vegetation, including food bearing plants Animals, insects Fossils Terrain, soil, earth 	<i>Added</i> <i>Anima/insects todo</i>
	2. Non-Visual Connection with Nature. Auditory, haptic, olfactory, or gustatory stimuli that engender a deliberate and positive reference to nature, living systems or natural processes.	<i>Partially applicable (auditory)</i> Fragrant herbs and flowers <ul style="list-style-type: none"> Songbirds Sound of Flowing water Weather (rain, wind, hail) Sun patches 	Added Sound of Flowing water <ul style="list-style-type: none"> Weather (rain, wind, hail) Sun patches (difficult)
	3. Non-Rhythmic Sensory Stimuli. Stochastic and ephemeral connections with nature that may be analyzed statistically but may not be predicted precisely.	<i>Applicable and relevant</i> <ul style="list-style-type: none"> Cloud movement Breezes Plant life rustling Water babbling Insect and animal movement Birds chirping 	Added <ul style="list-style-type: none"> Water babbling Cloud movement
	4. Thermal & Airflow Variability. Subtle changes in air temperature, relative humidity, airflow across the skin, and surface temperatures that mimic natural environments.	<i>N/A to Virtual Domain</i>	
	5. Presence of Water. A condition that enhances the experience of a place through seeing, hearing or touching water.	<i>Applicable and relevant</i> Naturally Occurring River, stream, ocean, pond, wetland Visual access to rainfall and flows Seasonal arroyos	<i>Added a river, a large deadly pool and several wetland areas, need more.</i>

	<p>6. Dynamic & Diffuse Light. Leverages varying intensities of light and shadow that change over time to create conditions that occur in nature.</p>	<p><i>Applicable and relevant</i></p> <ul style="list-style-type: none"> • Daylight from multiple angles • Direct sunlight • Diurnal and seasonal light • Firelight • Moonlight and star light • Bioluminescence 	<p><i>Added</i></p> <ul style="list-style-type: none"> • Moonlight and star light • Direct sunlight
	<p>7. Connection with Natural Systems. Awareness of natural processes, especially seasonal and temporal changes characteristic of a healthy ecosystem</p>	<p><i>N/A to Virtual Domain</i></p> <ul style="list-style-type: none"> • Climate and weather patterns (rain, hail, snow; wind, clouds, fog; thunder, lightning) • Hydrology (precipitation, surface water flows and resources; flooding, drought; seasonal arroyos) • Geology (visible fault lines and fossils; erosion, shifting dunes) • Pollination, growth, aging and decomposition (insects, flowering, plants) • Diurnal patterns (light color and intensity; shadow casting; plant receptivity; animal behaviour; tidal changes) • Night sky (stars, constellations, the Milky Way) and cycles (moon stages, eclipses, planetary alignments, astronomical events) 	<p><i>Changing weather systems need to be added.</i></p>
<p><i>Natural Analogues</i></p>	<p>1 Biomorphic Forms & Patterns. Symbolic references to contoured, patterned, textured or numerical arrangements that persist in nature.</p>	<p><i>Applicable and relevant however difficult to apply to natural landscape(out of scope)</i></p>	
	<p>2 Material Connection with Nature. Materials and elements from nature that, through minimal processing, reflect the local ecology or geology and create a distinct sense of place.</p>	<p><i>N/A to Virtual Domain</i></p>	
	<p>3 Complexity & Order. Rich sensory information that</p>	<p><i>Applicable and relevant</i></p>	

<i>Nature of the space</i>	<p>1 Prospect. An unimpeded view over a distance, for surveillance and planning.</p>	<p><i>Applicable and relevant</i></p>	<p><i>Added several places where player can see unimpeded view over a distance, for surveillance and planning</i></p>
	<p>2 Refuge. A place for withdrawal from environmental conditions or the main flow of activity, in which the individual is protected from behind and overhead.</p>	<p><i>Applicable and relevant</i></p> <ul style="list-style-type: none"> • Modular refuge: Small protection (high-back chair, overhead trellis) • Partial refuge: Several sides covered (reading nooks, booth seating, bay window seats, canopy beds, gazebos, canopy trees, arcades, covered walkways or porches) • Extensive refuge: near or complete concealment (reading/telephone/ sleeping pods, meeting rooms with 3+ walls, private offices, tree houses) 	<p><i>Added several places where player can seek refuge from environment(i.e caves)</i></p>
	<p>3 Mystery. The promise of more information, achieved through partially obscured views or other sensory devices that entice the individual to travel deeper into the environment.</p>	<p><i>Applicable and relevant</i></p> <ul style="list-style-type: none"> • Curving edges • Winding paths 	<ul style="list-style-type: none"> • <i>Several paths to the game have Curving edges & Winding paths</i>
	<p>4 Risk/Peril. An identifiable threat coupled with a reliable safeguard.</p>	<p><i>Applicable and relevant</i></p> <p>Spatial Attributes</p> <ul style="list-style-type: none"> • Heights • Gravity • Water <p>Perceived Risks</p> <ul style="list-style-type: none"> • Falling • Getting wet • Getting hurt • Loss of control 	<p><i>Lots of places offer the opportunity for seeking peril/danger(i.e cliffs, & drops)</i></p>

Appendix S: MindFlow ShadowMoss Island Areas of Interest List

- | | |
|--------------------------------------|--------------------------------------|
| 1 Mountain Peak | 31 Precarious Cliff GeoMorphsite |
| 2 Fake Mountain Peak 1 | 32 Coral Reef |
| 3 Fake Mountain Peak 2 | 33 Underwater Sinkhole |
| 4 Grassy Cliff Verge | 34 Caldera GeoMorphsite |
| 5 Mountian Ridge Cave 1 | 35 Mountian Ridge 2 GeoMorphsite |
| 6 Mountian River Mouth Cave | 36 Underwater GeoMorphsite Landform |
| 7 Beach GeoMorphsite Cavern | 37 Flora GeoMorphsite(Spaghnum MOss) |
| 8 Mountian Ridge | 38 Mountian Ridge Cave Exit |
| 9 Grassy Cliff Verge 2 | 39 Mid Mountian Range GeoMorphsite |
| 10 Rock Face GeoMorphsite | 40 Cliff face Cavern Exit |
| 11 Eroded Rock Beach 1 | 41 Cliff face GeoMorphsite(stairs) |
| 12 Eroded Rock Beach 2 | 42 Dead Giant Tree GeoMorphsite |
| 13 Mountain Rock Cliff Start | 43 Fiant Flora GeoMorphsite |
| 14 Straight Cliff Verge GeoMorphsite | 44 Sea Stacks |
| 15 Cliff face Cavern Entrance | |
| 16 Waterfall Hidden Cavern Base | |
| 17 Waterfall +Organic Bridge | |
| 18 Meandering River+Swallet Hole | |
| 19 Mini Waterfalls | |
| 20 Ceyote(Sinkhole) | |
| 21 Mountian Face GeoMorphsite | |
| 22 Mini-Rock Formation GeoMorphsite | |
| 23 Mountian Lake(salt flats) | |
| 24 Grassy Cliff Verge 2 | |
| 25 Giant Tree GeoMorphsite | |
| 26 Mini-Forest GeoMorphsite | |
| 27 Beach GeoMorphsite | |
| 28 Sharps Rocks GeoMorphsite | |
| 29 Round Grassy Cliff Verge | |
| 30 Sea Archway& Caverns | |

Appendix T: Refined Virtual Landscape Design Pro-Production: Contextual Reference

Pre-Production: Contextual Reference		
Area/Phase	Number	Guidance Notes
A) Inspiration/Observation	1	
B) Collation	2	
C) Synthesisation	3	
D) Categorisation	4	
E) Organisation	5	
F. Presentation	6	

Appendix U: ShadowMoss Journal – MindFlow

- 1) I need a process of design that is flexible and quick, reactive and that supports emergent iteration, I don't like 3D tools as they are geared towards production, I need a real pre-production tool, beyond greyboxing....I'm fond of the idea of landscape Marquette's, but again it can quickly become a production tool (actual landscape scaled) rather a pre-prod tool for a longer process.
- 2) process: I'm a little concerned about creating a new 3d landscape without actually getting my hands on a prototype or creating one, 3d tools are limited abstract and aren't reactive enough for my creative needs...alternatives?
 - Clay
 - Paper Mache
 - Plasticine?
- 3) Managed to find a useful term Landscape maquette, or landscape rapid prototyping as the first step:
 - a. Must be quick, efficient, and use minimal tool set as possible
 - b. Must allow for organic and structural forms
 - c. Must be semi-permanent
- 4) Rather than create a physical landscape, I've decided to go back to a quick iterative tool, **Vue 10**, appears to be the best tool to create a island map full of all the landscape forms, and features, similar to the Ireland Tourism map by Taylor James



Ireland Tourism map by Taylor James

- 5) Stuck with options of what to use
 - Geocontrol 2 for terrian: this can be used in a variety of engines
 - UDK-> fits into ios dev(ipad)
 - Unity=Cross platform(online, browser)
 - Cryengine 3: looks amazing, complex vertex tools, voxels and crving out caves etc., nice link from Geocontrol 2
 - Vue 10, best map design tools for quickly visualising the map in high res 3D, possible export the terrain to 3ds max then to cryengine or other engine tools

Also been thinking about a quick ref menu for the map, i.e 2d map wwith muitple interactive windows full of commentary and images/video/ref almost like a info repository, will sketch-up/note later....

- 1) Ok busy morning trying to find out what I need
- 2) Imapbuilder a tool that allow you to create an interactive map with notes/video etc... looks good but a very limited trial
- 3) amMap, free version for noncomm use, looks ok
- 4) <http://pinterest.com/andreadekker/organizing-ideas/>
- 5) mybookideas-online visualise, organise, realise I like it but it's online I want an offline tool that combines a mindmap with this, i.e clickable areas, zoom in, layers, rich media support, dynamic and quick, literally open project(app, online) then drag drop in resources etc.. build the creative piece.
- 6) Interactive sketchupbook for ipa, again nice but limited I need a cross platform app-
- 7) blueprint app for ipad for creating a interactive UI
- 8) Interactive reference poster-a mindmap with layers and rich media
 - a. <http://www.myideasbook.com/Pages/Book.aspx?book=c3be8137-6519-42b9-9832-f57ddd75cfe8>
- 9) I need a app like myideasbook but not, it's not intuitive and my research has led me to...
- 10) MyInteractiveReference
- 11) MindPhotoBook!

GUI prototyping URLs

- 1) <http://c2.com/cgi/wiki?GuiPrototypingTools>
- 2) <http://www.10screens.com/>
- 3) <http://www.adobe.com/products/flashcatalyst.html>
- 4) <http://www.antetype.com/examples.php>
- 5) <http://www.appsketcher.com/>
- 6) <http://www.axure.com/>
- 7) [https://iplotz.com/app/dream1978 umran.ali3](https://iplotz.com/app/dream1978_umran.ali3)
- 8) Photoshop mockup-complicated need a basic functional sketch before I do a PS mock-up
- 9) Ultramashupstudio seems like a useful tool,
- 10) Essentially what I need is a **mashup of all references** *Digital media content containing any or all of text, graphics, audio, video and animation drawn from pre-existing sources, to create a new derivative work.*
- 11) image mashup <http://www.imaginalaxy.com/galaxy.aspx#338>
- 12) ok so I didn't find anything!!! Arghh back to imapbuilder bleh
- 13) **I need a moodboard but beyond mood**
 - Sundboard: Audio clips inc commentary, and sound files, muisc tracks etc
 - Moodboard: Emotional resonance and feelings(psychological)
 - VisualReferenceboard(actual form, textture, colour reference)

- URL board(url's related to the
- Video Board(webcam, youtube, uloaded vids)
- Text board(comments, research, etc..)

<http://www.imgspark.com/> INteractive moodmoods....hmmmm

Prezi,

KEEPING THIS INFO IN A MIND/VISUAL MAP!! all the urls's the sites the images I need a repository for this work, like a visual diary

<http://moodstream.gettyimages.com/> Interesting concept

Combine a mindmap with geotagging with Prezi with a mutiple moodboard program, with the dynamicness of moodboard go you feel the area you are in.

<http://www.stixy.com/signup> umran.ali3

- 1) Came up with the concept I need, sorry term, it's a node based photoimage organiser
- 2) google it and came back with MediaGlow(research) a node/graph based image organizer
 - a. <http://www.moodshare.co/tour/>
 - b. <http://shadowmoss.moodshare.co/#>

- 1) Finish book
- 2) List all sections & refs for the completed NED grid(i.e LCA inspired sections)
- 3) Construct table of key features, i.e area vs Perceptual considerations
- 4) Define key areas, for ShadowMoss Island as a case study i.e go through the process of using the improved design process

- 5) Use a mindmapping photo tool to illustrate the key parts

- Visual Reference board(actual form, texture, colour reference)
- Emotional resonance & ref and feelings(psychological)
- Agency:Tacit or otherwise(.e tree should fall without prompt, or should change season colour)
- Green, Blue, Red? system? Traffic light? Green, Yellow Red

4) Build level, test against the set design(i.e RGB system), reflect or gather responses & feedback.

- 1) Found VUE & Compendium concept mapper, VUE looks look, nothing that is online though
 - 2) <https://sites.google.com/site/richardbyrnedpsite/rsu-1-mind-maps-and-timelines>
-

- 1) Found used Pivot Collection
- 2) hosting on Azure+Blog, word press
- 3) phototheme for wordpress:
 - a. <http://demo.wpbakery.com/?theme=photoshot> |Full screen looks v good
<http://themeforest.net/item/photoshot-photo-blogportfolio/108551?ref=mixey>
 - b. photoblog is the standard
 - c. http://www.gallyapp.com/tf_themes/?theme=Core look good, but dont work properly

- d. <http://labs.burntfeathers.com/?theme=village> Full screen but bit fiddly
<http://themeforest.net/item/village-an-awesome-fullscreen-wordpress-theme/237812?ref=ThemeProvince>
 - e. <http://easysite.by/?theme=teardrop> Teardrop, no text/blog support really full screen looks good.
 - f. <http://themes.swishthemes.com/?theme=photox> Look good, has support for fullscreen and text etc...
 - g. <http://www.kingsizetheme.com/blog/> Best selling looks goo, but hate the stupid arrow UI menu
 - h. http://themeforest.net/item/invictus-a-premium-photographer-portfolio-theme/180096?WT.ac=category_item&WT.seg_1=category_item&WT.z_author=doitmax
- 2) Sites for reading**
- 3) <http://www.tripwiremagazine.com/2012/02/wordpress-photography-themes.html>
 - 4) <http://www.thephotographus.com/freebies/14-superb-portfolio-and-photoblog-wordpress-themes-free/>
 - 5) <http://premiumthemesdirectory.com/14-best-wordpress-photo-blog-themes-from-themeforest.html>
 - 6) <http://www.1stwebdesigner.com/wordpress/commercial-wordpress-portfolio-photoblog-themes/>

Appendix V: ShadowMoss Journal Analysis and Reflection-in & On Action

1) Reflection in-Action (Journal Entry)	<i>Constant referring back to a folder for inspiration does not work as it breaks the fluid process of constructing the level, after an initial bout of confusion, the distance between your thoughts and plans for designing a level and the virtual landscape becomes less and less, until you reach that magical point where your hands can effortlessly glide over a keyboard and mouse, instinctively navigate the full toolset via shortcuts and menu selections to build what you imagine</i>
Analysis:	Current folder/file organisation of even small amount of visual data is difficult Managing reference data with traditional methods becomes a barrier to creation action and achieving a creative flow
Reflection on action:	There is a sense of frustration here that is clear and evident, the tools needs to be transparent as it not a focus and ultimately if it is unable to deliver what I required it became a distraction

2) Reflection in-Action (Journal Entry)	<i>R&R can sometimes minor be comparable to the actual physicality of building a level, ideas, and unlinked concepts can suddenly join to become a feasible physical concept, function of a particular part of the landscape(i.e lake) can lead to thoughts about how, where and why the environment around the lake would form, everything appears to interlink, although I would not by no means lessen the importance of R&R phase, there is something can only be felt when actually building the virtual space piece by piece</i>
Analysis:	Current system of file/folders does not allow for relationships across reference data to develop over time in a natural manner. Emergent design is a real phenomena and one that can be a positive design experience
Reflection on action:	Environment design and the subsequent building

3) Reflection in-Action (Journal Entry)	I need a process of design that is flexible and quick, reactive and that supports emergent iteration, I don't like 3D tools as they are geared towards production, I need a real pre-production tool, beyond greyboxing....I'm fond of the idea of landscape Marquette's, but again it can quickly become a production tool (actual landscape scaled) rather a pre-prod tool for a longer process.
Analysis:	At this stage the desire to create is strong, time is limited, the focus is on emergent, quick, and reactive iteration, 3D tools are an unnecessary distraction as they complicate the process unnecessarily Need to avoid using a tool/process that in-itself becomes a mini-production; emphasis is on speed of rapid pre-production

Reflection on action:	There was a real temptation to immerse myself in an additional practice(physical prototyping) but a recognition this was a temptation to be avoided, it's all too easy as a creative to spend far too long experimenting but the work and research was grounded in industry and student practice so it was imperative to explore the entire process from concept to completion, and although I would sincerely like to explore physical prototyping, this was out of scope for this research cycle, in hindsight I am glad I avoided and continued on my original trajectory.
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4) Reflection in-Action (Journal Entry)	process: I'm a little concerned about creating a new 3D landscape without actually getting my hands on a prototype or creating one, 3d tools are limited abstract and aren't reactive enough for my creative needs...alternatives?
Analysis:	Importance of pre-production, reinforcement that 3D tools are an overkill, 2D interface is adequate for the jobs
Reflection on action:	I'm not sure if this is a pre-occupation for me, a fear of moving into building a 3d environment without adequate grounding

5) Reflection in-Action (Journal Entry)	Managed to find a useful term Landscape maquette, or landscape rapid prototyping as the first step: a. Must be quick, efficient, and use minimal tool set as possible b. Must allow for organic and structural forms c. Must be semi-permanent
Analysis:	Reinforcement of user requirements for rapid prototyping a 3D environment(quick,streamlined)
Reflection on action:	There is a hint of the technologies I have come across at his point either being too simplistic or too complex for my need, again that rapid reactive ability to quickly create something and change it, reflects the process of iterative design

6) Reflection in-Action (Journal Entry)	Rather than create a physical landscape, I've decided to go back to a quick iterative tool, Vue 10 , appears to be the best tool to create an island map full of all the landscape forms, and features,
Analysis:	Physical prototyping a 3D environment. can a distraction without appropriate experience or tools in place, however there is a immediacy to shaping an environment by hand that should be explored.
Reflection:	



7) Reflection in-Action (Journal Entry)	Also been thinking about a quick ref menu for the map, i.e 2d map with multiple interactive windows full of commentary and images/video/ref almost like a info repository, will sketch-up/note later....
Analysis:	First emergence of the MindFlow app, as a tool to service the 3d environment modelling
Reflection on action:	It's interesting to see how the tools(MindFlow) is shaping up as a direct need, I'm being to articulate what I need and what is missing more and more
8) Reflection in-Action (Journal Entry)	mybookideas-online visualise, organise, realise I like it but it's online I want an offline tool that combines a mindmap with this, i.e. clickable areas, zoom in, layers, rich media support, dynamic and quick, literally open project(app, online) then drag drop in resources etc.. build the creative piece.
Analysis:	Recognition that the tool must be offline and online, and is an evolution of mind mapping, a fluid and easy to use tool
Reflection:	
9) Journal Entry	14) Essentially what I need is a mashup of all references <i>Digital media content containing any or all of text, graphics, audio, video and animation drawn from pre-existing sources, to create a new derivative work.</i>
Analysis:	Reinforcement of multivariate information, references are not limited to images, bring a sense of coherence across media types of existing information to derive new work
Reflection on action:	There is a clear reaffirmation of the multivariate information that I require for th work, it is clearly not just images.



10) Reflection in-Action (Journal Entry)	<p>I need a moodboard but beyond mood</p> <ul style="list-style-type: none"> • Soundboard: Audio clips inc commentary, and sound files, music tracks etc • Moodboard: Emotional resonance and feelings(psychological) • VisualReferenceboard(actual form, textture, colour reference) • URL board(url's related to the • Video Board(webcam, youtube, uloaded vids) • Text board (comments, research, etc..)
Analysis:	Fragmentation of multimedia types with proposed usage
Reflection on action:	The articulation of what I require has become clear, and powerful it's not just images, it's the mood of the environment, it's the spirit what make it a place, images can paint one aspect but what was needed was a way and process a tool to capture the mood. The initial breakdown and usage on the mood and visual references, even on reflection after the even seems plausible and insightful, I need to explore this further at some point.
11) Reflection in-Action (Journal Entry)	<p>3) Came up with the concept I need, sorry term, it's a node based photoimage organiser</p> <p>4) Google it and came back with MediaGlow(research) a node/graph based image organizer</p>
Analysis:	Identification of a keyword(node) and at a minimum a photoimage organiser
Reflection on action:	My initial assumptions about the development of ones grammar and syntax forming during development were correct, it tooks a significant amount of time searching vainly for tools/process and or research projects that I could use as a foundation to develop my ideas from, only when the correct (almost by magic) term was used, did I very quickly discover media glow, which then cascaded the correct keyword search by providing relevant material.



Appendix W: ShadowMoss PrePREP

Pre-Production: Contextual Reference		
Area/Phase	Number	Guidance Notes
A) Inspiration/Observation	1	
B) Collation	2	
C) Synthesisation	3	
D) Categorisation	4	
E) Organisation	5	
F) Presentation	6	

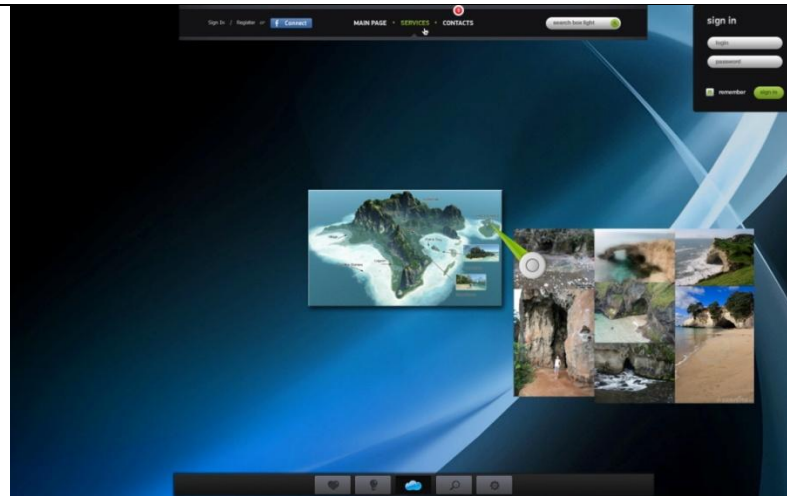
Appendix X: UX Board for MindFlow

<p>1</p>		<p>Users are presented with a blank space, this space is based on a Zooming user interface so users are able to move in any direction freely and zoom in/out unrestricted.</p> <p>Users are able to connect/share the space with others through social media.</p> <p>The portal for the app can be accessed offline in addition to an online version(which syncs automatically)</p>
<p>2</p>		<p>Users are prompted to focus on a particular high concept idea. This can take the form of any supported material, a music clip, an image a piece of text, a word. This</p>

<p>3</p>		<p>Users can select blank templates as a start. These are based around a collection of different ideas and supported initial problem of finding a relevant and particular key piece of information as the 'seed'</p>
<p>4</p>		<p>Users then insert any type of information. The app supports :</p> <ul style="list-style-type: none"> word documents PDF documents Mp3s(music) Video(either embedded or linked) Audio notes(recorded directed with the app)

<p>5</p>		<p>Users can import or drag any media type as the central idea. This is automatically set as the 'home', no matter where the user is on the canvas space, and no matter how far they have zoomed in/out, clicking on the home icon will bring this image back as the central focus.</p>
<p>6</p>		<p>Users then start to add 'nodes' Right clicking brings up a context menu and a new 'node' can be inserted at any point. These nodes can either be windows on the image (embossed) or as shown in the image an abstracted arrowhead. Clicking on a node can</p>

7



Users then start importing (drag and drop) or searching (browser search icon in main bar) for additional references

8



Users quickly build up a multivariate contextual information map of their idea, different aspects of the idea branch out and are able to be expanded with additional nodes.



Users are able to draw directly on the screen as an additional ‘notes’ layer. This enables users to link disparate areas together



At anytime users are able to collapse nodes to make digesting the screen space easier. Items can be hidden, placed on layers, or hidden by file type. Once finished the final map can be exported as a collapsed image or shared as a workspace with other collaborators .