



*Supplement of*

## **Virtual field trips utilizing virtual outcrop: construction, delivery and implications for the future**

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# IPG 2020/21 – Pyrenees VFT

## Software Instructions

Due to the current travel restrictions we will be doing a Virtual Field Trip (VFT). The VFT will be run through LIME – a virtual outcrop software and GoogleEarth. You can either download these softwares and install them locally on your computer, or you can use your computer to log onto a machine in the University and run the trip over the VDI.

We appreciate that everyone would rather be in the Pyrenees, we would rather be in the Pyrenees! However, we are lucky enough to have worked there for years and consequently we have collected a lot of data which we can use to bring you a really good substitute. Much of what we will do it based around virtual outcrops that were collected with drones. If you want a quick overview of the technology, John recently gave a plenary talk at a conference. It's a useful introduction. It can be found [here](#) (the main part starts at 11 minutes in).

### Local vs Remote Desktop (VDI)

The first decision is whether you want to run the software locally, from G15/16 in Meston (make sure you have access to LIME on these machines though) or whether you want to run it off the remote desk top (VDI) in the University. This decision will be based on the graphics capability of your computer and also the quality of your internet connect. To run locally you should have a computer running the 64bit Windows operating system. It will not work on macs. The software is graphics intense and we recommend a dedicated GPU for running the 3D graphics (e.g. NVIDIA Quadro series >2GB). Also >4GB RAM (recommended 16GB or more) is needed to load some of the larger 3D model data.

If you don't have access to computers with these spec then you will need to work on the VDI, which runs very well, but there can be slight lag depending on your internet speed. If you are working on your own computer then you need to Install the software (see following section).

# Before you start...

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## 1. You will need

- Laptop/Desktop
- Mouse
- Speaker (or ear/headphones) and microphone
- A second screen can help (e.g. computer monitor or tv) but not necessary  
**(no student should buy an additional screen for this assessment)**

## 2. Register for SAFARI

Regardless of whether you are working on your own computer or on the VDI, you will need to register for SAFARI.

SafariDB is a research project at UoA which collects and disseminates analogue data for oil companies. The site hosts several hundred virtual outcrops which you can view in SafariDB over the web or download to run on LIME.

1. To register go to <https://safariidb.com/>
2. Click on log in
3. Then register here
4. Select University of Aberdeen as your company
5. Then enter your name and email address.

Once you have registered you can explore the database. Click on Sponsor. On the next page there is about information which includes a series of short videos about how to use SAFARI. This is not necessary for the field course, but you might find it useful.

**You will need your Safari log in when we run the VFT**

## 3. Download © Google Earth Pro

If you are accessing © Google Earth Pro through the VDI it will be pre-installed, search or find it under 'G' in start bar. IT will also automatically open when .kmz files are selected.

If you wish to use directly on your own laptop/pc go to:

<https://www.google.com/earth/versions/#download-pro> and download the version compatible to your device.

## 4. LIME

If you are accessing LIME through the VDI it will be pre-installed, search or find it under 'L' in start bar. IT will also automatically open when .lime files are selected.

If you want to install the software and locally download LIME (30-day free trial) <http://virtualoutcrop.com/lime/download> and install it.

# Using LIME

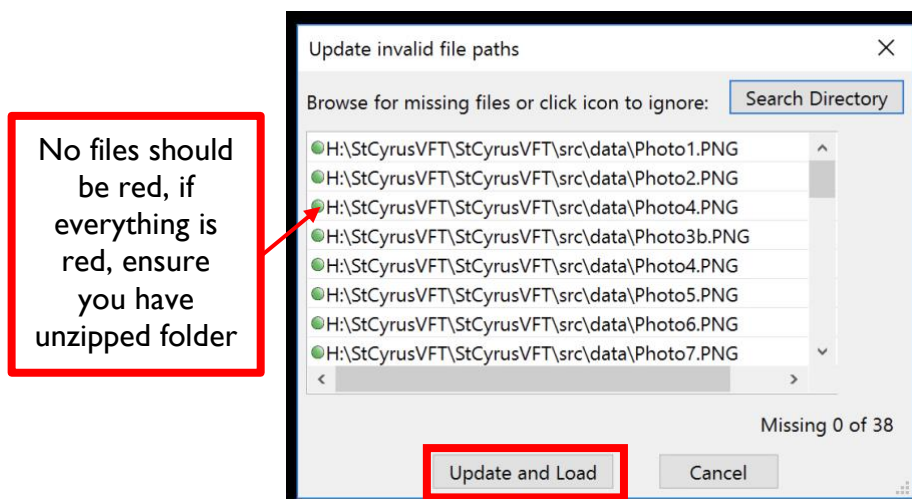
We are going to run part of this virtual fieldtrip (VFT) using specialist software called LIME. Don't panic - the following provides step-by step instructions on getting started.

## Getting started on the VDI

1. Open a virtual desktop environment, to do this go to a web browsers and type vdi.abdn.ac.uk
2. Log in with blackboard/computer login
3. Click vClassroom

Once you have desktop up, open google and navigate to:

1. MyAberdeen —>> Courses —>> Professional Skills Incorporating International Field Trip —>> Course Materials —>> Pyrenees Virtual Field Trip —>> Select the current day of field trip
2. Download zipped Lime file, save to our user space on the virtual machine (H:)
3. In H: drive unzip folder
4. Open unzipped folder and double click to launch the Lime file (additional folder labeled data, will also be present, ignore this folder)
5. If you get a dialogue box that says update invalid file paths, click Update and Load. This might take a few moments depending on how fast your internet is. Once the project is loaded you are ready to start work.
6. In some case we have used Google Streetview scenes – these will always come up as red links. In that case click continue and ignore the error messages. The link will look something like @37.4531601,-122.1214985,3a,75y,100t/data



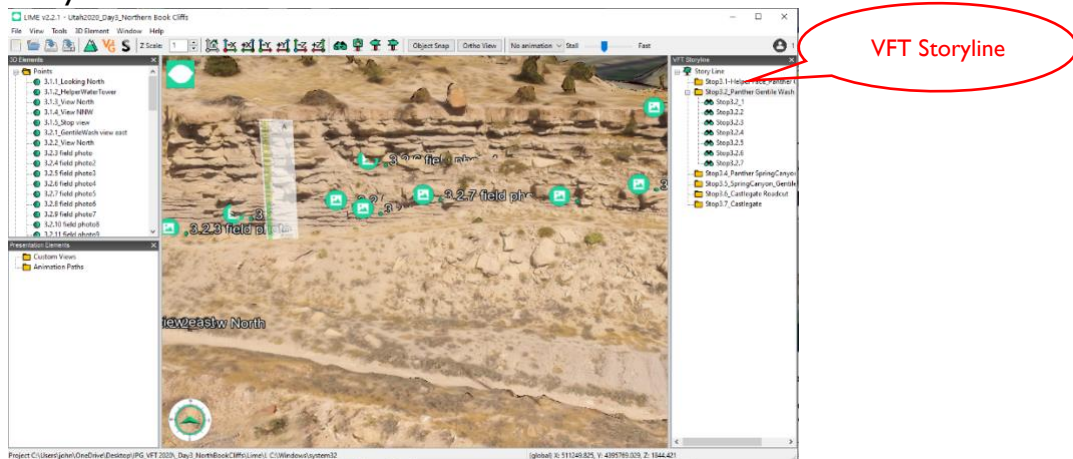
## Getting started when running locally

1. Open google and navigate to: MyAberdeen —>> Courses —>> Professional Skills Incorporating International Field Trip —>> Course Materials —>> Pyrenees Virtual Field Trip —>> Select the current day of field trip
1. Download zipped Lime file, save to our user space on to your computer
2. Unzip the folder
3. Open unzipped folder and double click to launch the Lime file (additional folder labeled data, will also be present, ignore this folder)

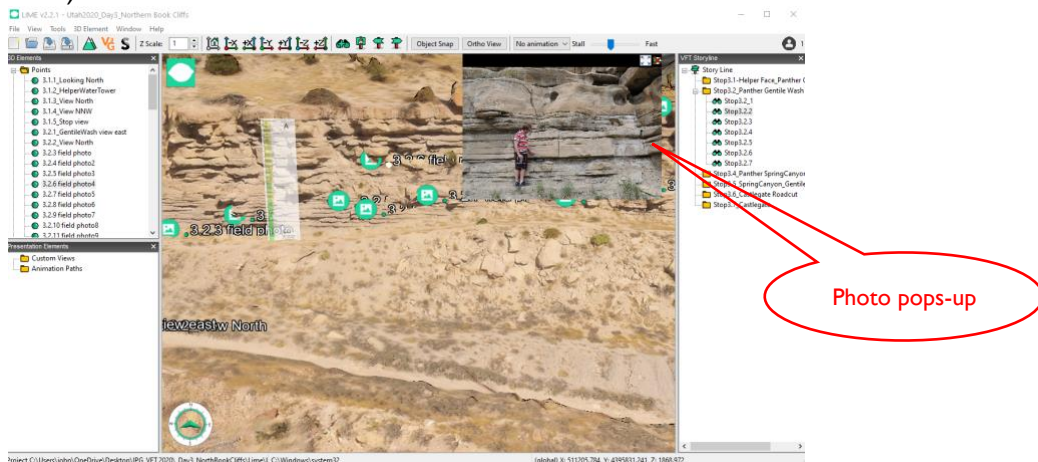
- If you get a dialogue box that says update invalid file paths, click Update and Load. This might take a few moments depending on how fast your internet is. Once the project is loaded you are ready to start work.
- In some case we have used Google Streetview scenes – these will always come up as red links. In that case click continue and ignore the error messages. The link will look something like @37.4531601,-122.1214985,3a,75y,100t/data

**In the LIME Virtual Fieldtrip - Outcrop example for 1 and 3 found at Helper: Panther Tongue Mbr, VOG Group, <https://v3geo.com/model/42>**

- The main navigation tool is the menu on the right side of the screen called “VFT Storyline”.



- In the VFT Storyline there is a series of folders for each of the Stops of the day. Click on the + to expand a folder
- Double click on the first “scene” on the list, this will bring up various elements within the view. Explore the view and open the various green points (Left Mouse +Alt).



- This brings up a photo (or streetview or gigapan etc). Explore this and then click on the top right of the pop up window to close. Note you need to close one, before you can open the next.
- The VFT Storyline is designed to take you through the exercise. Work your way down the list, following the instructions and doing the exercises. You can break-

away and explore the models at any point. This is best done once the 3D model is loaded. The system is getting the model from the cloud, so it sometimes takes a few seconds to load to full resolution. You can get back to any point by clicking in the Storyline

<b>Navigation/tool</b>	<b>Windows</b>		<b>Mac</b>
<i>Rotate Model</i>	Left Mouse		Same
<i>Move View Laterally</i>	Middle Mouse	Left and Right mouse together	No option with apple mouse, or same with other brand mouse.
<i>Specific Move/Set Rotation Point</i>	Double click (left mouse)		Same
<i>Zoom in and out</i>	Right Mouse		Same
<i>Open point attachment (e.g. photo)</i>	Alt+left		Option+left
<i>Close point attachment (e.g. photo)</i>	[x] top right of photo		Same
<i>To measure a distance between 2 points on the model</i>	Ctrl L and then shift click on the two points. The box will give the true distance and the vertical distance between the points		Same
<i>To measure a strike and dip</i>	Ctrl T and then shift click on the three points. This will give a small plane and a dialogue box with strike and dip info		Same

# Using © Google Earth Pro

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We are going to run part of this virtual fieldtrip (VFT) using © Google Earth Pro. It is installed on the University Machines and you are going to run it through a remote desktop (VDI) or locally on your own pc if you have decided to do so.

## **Getting started in VDI**

1. Open a virtual desktop environment, to do this go to a web browsers and type vdi.abdn.ac.uk
2. Log in with blackboard login
3. Click virtual Classroom

Once you have desktop up, open google and navigate to:

7. MyAberdeen —>> Courses —>> Professional Skills Incorporating International Field Trip —>> Course Materials —>> Pyrenees Virtual Field Trip —>> Select the current day of field trip
8. Download the kmz. file, save to our user space on the virtual machine (H:)
9. Double click the kmz. File to launch google earth
10. Each element may take a moment to load, you will see two grey arrows, this may take a few seconds. No red [x] should appear.

## **Getting started when running locally**

1. Open google and navigate to: MyAberdeen —>> Courses —>> Professional Skills Incorporating International Field Trip —>> Course Materials —>> Pyrenees Virtual Field Trip —>> Select the current day of field trip
6. Download the kmz. file, save to our computer
7. Double click the kmz. File to launch google earth
8. Each element may take a moment to load, you will see two grey arrows, this may take a few seconds. No red [x] should appear.

## Supplement 2

### Models on V3Geo.com

#### Utah

<a href="https://v3geo.com/model/98">https://v3geo.com/model/98</a>	Arches Road Cut
<a href="https://v3geo.com/model/96">https://v3geo.com/model/96</a>	Argyll Lake
<a href="https://v3geo.com/model/100">https://v3geo.com/model/100</a>	Argyll Ridge
<a href="https://v3geo.com/model/101">https://v3geo.com/model/101</a>	Beckwith Plateau
<a href="https://v3geo.com/model/8">https://v3geo.com/model/8</a>	Blaze Canyon
<a href="https://v3geo.com/model/97">https://v3geo.com/model/97</a>	Blue Castle Canyon
<a href="https://v3geo.com/model/89">https://v3geo.com/model/89</a>	Bullfrog
<a href="https://v3geo.com/model/88">https://v3geo.com/model/88</a>	Cainville Wash
<a href="https://v3geo.com/model/86">https://v3geo.com/model/86</a>	Castlegate
	Castlegate Road Cut
<a href="https://v3geo.com/model/85">https://v3geo.com/model/85</a>	
<a href="https://v3geo.com/model/110">https://v3geo.com/model/110</a>	Cathedral Valley
<a href="https://v3geo.com/model/111">https://v3geo.com/model/111</a>	Courthouse Wash
<a href="https://v3geo.com/model/79">https://v3geo.com/model/79</a>	Haddon Holes
<a href="https://v3geo.com/model/78">https://v3geo.com/model/78</a>	Hatch Mesa
<a href="https://v3geo.com/model/42">https://v3geo.com/model/42</a>	Panther Tongue
<a href="https://v3geo.com/model/109">https://v3geo.com/model/109</a>	Henry Mtn Sill
<a href="https://v3geo.com/model/52">https://v3geo.com/model/52</a>	Ivie Creek
<a href="https://v3geo.com/model/102">https://v3geo.com/model/102</a>	Shiurup
<a href="https://v3geo.com/model/9">https://v3geo.com/model/9</a>	Thompson
<a href="https://v3geo.com/model/28">https://v3geo.com/model/28</a>	Woodside Canyon
<a href="https://v3geo.com/model/21">https://v3geo.com/model/21</a>	Woodside Channel

#### Spain

<a href="https://v3geo.com/model/14">https://v3geo.com/model/14</a>	Aguero
<a href="https://v3geo.com/model/1">https://v3geo.com/model/1</a>	Ainsa
<a href="https://v3geo.com/model/30">https://v3geo.com/model/30</a>	Ainsa2
<a href="https://v3geo.com/model/17">https://v3geo.com/model/17</a>	Serrata
<a href="https://v3geo.com/model/22">https://v3geo.com/model/22</a>	Bolea
<a href="https://v3geo.com/model/12">https://v3geo.com/model/12</a>	Cinca Canal
<a href="https://v3geo.com/model/26">https://v3geo.com/model/26</a>	Lascorz
<a href="https://v3geo.com/model/2">https://v3geo.com/model/2</a>	Riglos



# Supplement 3

## Example Questionnaire

		YES	NO
I	confirm that I have read and understood the above statement		
II	Gender		
III	Nationality		

All the following questions are rated 1-5 (one disagree, five agree)

### Learning Outcomes

- 1 I feel like I have learnt new things during the course of this VFT
- 2 I have a better understanding of exploration process
- 3 I have a better understanding of the process involved in field development
- 4 I have improved my understanding of extensional tectonics
- 5 I understand depositional systems in arid rift basins
- 6 I am familiar with different types of shallow marine systems and why it is important
- 7 Sequence stratigraphy is no longer a total mystery to me
- 8 I understand the DFS concept and its implications to exploration and production
- 9 I have a better understanding of the impact of igneous rocks in basins
- 10 I have a better salt tectonics and the impact of halokinetics on sedimentation
- 11 I feel like I learnt things that I would not have learnt on normal trip

*Tell us what else you have learnt and what you feel we have missed*

### Trip Timing and delivery

We had a choice between running the trip in a fixed time slot (as we did) or just making the material available and letting you work through it in your own time. This was a trade off between convenience and you working in teams and getting feedback

- 12 I liked having the fieldtrip at a fixed time, like on a conventional trip
- 13 Team work was really important
- 14 I would liked more flexibility with the delivery times
- 15 I really valued the sessions where we discussed with the tutors
- 16 The demonstrators were useful?
- 17 There should have been more demonstrators/staff
- 18 Having groups was better than working alone
- 19 I agree with how the groups were allocated each day

*Any other comments on the timing and delivery*

### IT and delivery Mechanisms

We used a variety of technologies to deliver the VFT which were designed to allow students in a wide variety of locations with different computer and internet capacity to join the trip. We would like to understand what worked and what didn't.

- 20 Did you work on your own computer or via the VDI?
- 21 [What is your average internet speed? \(use www.speedtest.net\)](http://www.speedtest.net)

- 22 PC or Mac
- 23 Overall the IT solution worked for me
- 24 I was able to download the material without problems

*Any other comments on the IT set up*

### **Software and content**

During the course of this trip we have used three main softwares, Lime, GoogleEarth and Blackboard. We used a range of technologies to deliver the VFT which were designed to allow students in a wide variety of locations with different computer and internet capacity to join the trip. We would like to understand what worked and what didn't.

- 25 Training in Lime and/or GoogleEarth should be given before the trip (would mean an extra day)
- 26 I understand how to use GoogleEarth for geology
- 27 Lime is a good tool for VFTs
- 28 Once I got the hang of it, I enjoyed using Lime
- 29 I am surprised at how much you can do with GoogleEarth
- 30 Blackboard worked well for distributing the material
- 31 The fieldguide was a great resource with lots of useful info.

*Any other comments on the software. Suggestions for improvements to Lime are especially welcome as that will help us improve the software for the future*

### **The Individual Days**

#### ***Days 1 and 2 Rift basins and exploration***

- 32 I learnt a lot from these days
- 33 I enjoyed these days
- 34 The exercise worked well

#### ***Days 3-5 Shallow marine systems and sequence stratigraphy***

- 35 I learnt a lot from these days
- 36 I enjoyed these days
- 37 The production exercise worked well

#### ***Days 6 Transgressive systems***

- 38 I learnt a lot from this day
- 39 I enjoyed this day

#### ***Day 7 Fluvial systems***

40 I learnt a lot from this day  
41 I enjoyed this day

***Days 8 Igneous systems in a petroleum context***

42 I learnt a lot from this day  
43 I enjoyed this day

***Days 9-10 Canyonlands and Salt related systems***

44 I learnt a lot from these days  
45 I enjoyed these days  
46 The salt basin exploration exercise worked well

***Day 11 Structure***

47 I learnt a lot from this day  
48 I enjoyed this day

*Use this space for any additional comments about specific days*

**And Finally**

Thanks for bearing with us. We have enjoyed the trip and have been very impressed by your enthusiasm and efforts!

49 I think virtual fieldtrips are actually better than real ones  
50 I'd rather be in Utah

*Is there anything else you would like to comment on?*