

00:00:00.000 --> 00:00:03.610

Markert, Kel (MSFC-ST11)[UAH]

Cities within the data sets and how we can leverage those to extract out surface water.

00:00:04.230 --> 00:00:26.470

Markert, Kel (MSFC-ST11)[UAH]

Uh and on Wednesday, what we did is so you know, remote, sensing data, only provide information on what's on the land surface. So we have to go in and try and extract out some kind of indication of what is floods and we do that by looking at historical permanent water or we can do some change detection between 2 different.

00:00:26.540 --> 00:00:39.800

Markert, Kel (MSFC-ST11)[UAH]

From 2 different acquisitions and we we export some of that. We also looked at creating a flood depth data data layers well that's again.

00:00:41.760 --> 00:01:00.380

Markert, Kel (MSFC-ST11)[UAH]

The community is actively researching how to improve flood depth estimations, but they at least gives some sort of estimate on impact as well. So today, so we kind of walk through the whole process like the background extracting surface water, creating floods, creating a flood depth map.

00:01:01.440 --> 00:01:23.120

Markert, Kel (MSFC-ST11)[UAH]

So now, what we're going to do is go in and talk about scaling our workflows. So we have. We have the the idea of how it all works. Now we want to set something up and actually run it and we're going to talk through some considerations surrounding you know, setting things up and running at scale and what I mean by at scale is running it over large areas or over large time periods.

00:01:24.560 --> 00:01:26.810

Markert, Kel (MSFC-ST11)[UAH]

OK, UM, so here's the outline.

00:01:28.460 --> 00:01:38.240

Markert, Kel (MSFC-ST11)[UAH]

Actually flipped a couple things here, but we're going to review the Workflow. We're actually going to talk about piping functions later and what that actually means.

00:01:38.300 --> 00:01:43.960

Markert, Kel (MSFC-ST11)[UAH]

Uh preventing edge cases and export considerations OK.

00:01:44.900 --> 00:01:46.020

Markert, Kel (MSFC-ST11)[UAH]

So dumb.

00:01:47.380 --> 00:02:07.670

Markert, Kel (MSFC-ST11)[UAH]

You know going back and talking about our whole workflow, so reviewing our workflow. So we start off with optical imagery right and typically with optical imagery. We want to do some some quality control of the data right? That includes cloud shadow snow masking and then if you do any kind of of.

00:02:08.670 --> 00:02:18.230

Markert, Kel (MSFC-ST11)[UAH]

We go to ring correction or atmospheric correction in Earth engine datasets already have atmospheric correction. So we don't need to worry about that. But if you want to do terrain correction, we can do some of that as well.

00:02:19.000 --> 00:02:31.090

Markert, Kel (MSFC-ST11)[UAH]

Uh and then once we have our datasets kind of pre processed and ready to go then we want to extract out a surface water index, So what we what we do here is we leverage multiple.

00:02:31.360 --> 00:02:50.100

Markert, Kel (MSFC-ST11)[UAH]

Uh information from different channels of the electromagnetic spectrum and from there, then we can extract out basically what is water and extract out kind of rivers and lakes versus? What is land? Which is the white areas here but we then talked about.

00:02:50.160 --> 00:03:02.130

Markert, Kel (MSFC-ST11)[UAH]

Uh you know, taking this water index, and then creating into water map. So then here. Here's our water map where blue is the water areas for optical right similarly for SAR. We talked about.

00:03:02.980 --> 00:03:03.590

Markert, Kel (MSFC-ST11)[UAH]

Uhm.

00:03:04.430 --> 00:03:34.290

Markert, Kel (MSFC-ST11)[UAH]

Yeah, we start with our image. You know typically you do your Geo registration and and calibration. That's again already handled for us and then you do a train flattening or you're basically removing some of the artifacts of of the underlying terrain and then you do some special filtering to remove some of those at random noise and then you go in and create your surface water map right and from there. You do your different, saying and create flood Maps and all that right.

00:03:34.840 --> 00:03:43.870

Markert, Kel (MSFC-ST11)[UAH]

So I did. That review you know are there any questions on kind of like that general process or or how to do that using Hydra floods?

00:03:46.370 --> 00:03:50.180

Markert, Kel (MSFC-ST11)[UAH]

OK, good, I think I've you know, beating this horse enough.

00:03:51.610 --> 00:03:56.350

Markert, Kel (MSFC-ST11)[UAH]

OK, so now we want to talk about scaling right and you know one of the.

00:03:56.960 --> 00:04:27.110

Markert, Kel (MSFC-ST11)[UAH]

A problem not problems, but one of the general I guess challenges with scaling workflows is is something typically called edge cases and those that are more familiar with computer science terms might know what edge cases, but basically an edge case is a problem or situation that occurs like on this on the extremes of a situation right and so for example, we'll talk about this like an edge case in the Hydra flood sense would be like, what happens if.

00:04:27.490 --> 00:04:38.530

Markert, Kel (MSFC-ST11)[UAH]

You have an optical acquisition and we're running it through the process, but then they're you know it's all clouds and the cloud. Masking masked everything? What do you do then right and so?

00:04:38.590 --> 00:04:45.810

Markert, Kel (MSFC-ST11)[UAH]

So it's kind of funny? How many memes. I I just looked up edge case memes and there was quite a few of them so.

00:04:46.970 --> 00:05:08.280

Markert, Kel (MSFC-ST11)[UAH]

Uhm anyways OK, so in this case you know, I I just talked about it will actually go through examples on like when this fails. It was actually kind of fun trying to like break things and get things to you know, not work. So you know, we'll go through this example, where you.

00:05:08.900 --> 00:05:14.430

Markert, Kel (MSFC-ST11)[UAH]

Uh you know for large areas, you may have acquisitions that actually don't have.

00:05:16.770 --> 00:05:46.290

Markert, Kel (MSFC-ST11)[UAH]

They don't have data or the data is masked over areas that you think you should be extracting out the surface water and so the algorithms underlying assumption is that you actually have surface water in the in the image that can be clearly seen and sometimes that doesn't happen and it fails, and usually this manifests itself in this very cryptic error where it says dictionary does not contain key bucket means.

00:05:47.190 --> 00:05:54.840

Markert, Kel (MSFC-ST11)[UAH]

Which uh sounds very weird but actually what's going on? Is when it's trying to do the histogram sampling?

00:05:55.450 --> 00:05:56.700

Markert, Kel (MSFC-ST11)[UAH]

And and and

00:05:56.750 --> 00:06:06.640

Markert, Kel (MSFC-ST11)[UAH]

in uh basically bucket the the data into or you know group, the data into these buckets or you know ranges of data.

00:06:07.540 --> 00:06:27.930

Markert, Kel (MSFC-ST11)[UAH]

It doesn't have the data to to count how many observations or in those ranges. And so that's where you getting this error. So this is just saying It can't build a histogram and so we'll go through an example. Basically, how we do how we overcome that is if it can't build that we give it a value that says.

00:06:28.540 --> 00:06:31.470

Markert, Kel (MSFC-ST11)[UAH]

In the case that you can't build a histogram. Here's their best guess.

00:06:31.520 --> 00:06:36.670

Markert, Kel (MSFC-ST11)[UAH]

Yes, as to what's the threshold, and move on from there.

00:06:39.110 --> 00:06:55.880

Markert, Kel (MSFC-ST11)[UAH]

Uh another edge case this one we, we kind of touched upon the other day. And thanks to Kaylee for mentioning this basically sometimes you'll have this is a case in with SAR processing where sometimes you will have.

00:06:57.040 --> 00:07:09.130

Markert, Kel (MSFC-ST11)[UAH]

Uh an image that's completely over water and when you don't have Dems data to do the train corrections and you have this random image that's over water.

00:07:10.040 --> 00:07:26.090

Markert, Kel (MSFC-ST11)[UAH]

It will fail because there's no data. It can't provide him any information as to how they do. The train correction. And so a simple way to to do to fix that is give it all zeros because assuming it's flat right.

00:07:27.240 --> 00:07:28.520

Markert, Kel (MSFC-ST11)[UAH]

So that's another case.

00:07:29.350 --> 00:07:30.010

Markert, Kel (MSFC-ST11)[UAH]

Uhm.

00:07:31.090 --> 00:07:36.190

Markert, Kel (MSFC-ST11)[UAH]

I took screenshots of other cases, I didn't plot them in the the.

00:07:37.980 --> 00:08:07.940

Markert, Kel (MSFC-ST11)[UAH]

The PowerPoint but you know, another case would be too many concurrent aggregations. You know that's and I'll I'll update this and and provide when that happens, but basically when you get a too many concurrent aggregations error that basically means you're trying to do too much. You know, and on Earth engine. It does have some limitations and when you are trying to run processing over a large amount of area, or large number of of.

00:08:08.000 --> 00:08:14.560

Markert, Kel (MSFC-ST11)[UAH]

Uhm images it basically is trying to spawn too many processes and then that's where you get that error.

00:08:15.190 --> 00:08:21.920

Markert, Kel (MSFC-ST11)[UAH]

Uh yeah, we can explore a little more. I think I had one more, but I can't remember off the top of my head so.

00:08:21.970 --> 00:08:23.340

Markert, Kel (MSFC-ST11)[UAH]

But UM.

00:08:25.320 --> 00:08:43.770

Markert, Kel (MSFC-ST11)[UAH]

You know going so these are edge cases and then that last part that I mentioned was more for you know actually doing some processing and so when we're when we're doing our processing and we want to scale over large areas. I mean, you really. I was doing this today, and you really have to try and break it like I.

00:08:44.640 --> 00:08:52.970

Markert, Kel (MSFC-ST11)[UAH]

For some reason I was like OK. Let's try for all of the Americas, like North and South America and it ran and I'll just like come on.

00:08:55.350 --> 00:09:02.800

Markert, Kel (MSFC-ST11)[UAH]

Yeah, and not not just for one day like for 6 months kind of thing so.

00:09:03.820 --> 00:09:24.780

Markert, Kel (MSFC-ST11)[UAH]

Yeah, anyways, so you you really have to try and break it. But once you start doing a lot more of these like a more complex operations like data Fusion and pulling in multiple data streams. Then you start you know running into those challenges and there's a couple of ways that you can you know work to to fix that one of them is this dot pipe?

00:09:26.370 --> 00:09:35.950

Markert, Kel (MSFC-ST11)[UAH]

Function and we'll we'll go through an example today. So basically when we're going through our examples earlier.

We were using that apply funk.

00:09:36.680 --> 00:09:40.110

Markert, Kel (MSFC-ST11)[UAH]

Uh to to apply those functions through the data set right.

00:09:40.840 --> 00:10:12.360

Markert, Kel (MSFC-ST11)[UAH]

Well, each time you do that apply function. It is looping through all the images at once right so it's applying that one function to all the images and then you do the next. One is looping through all the images right so when you're doing these more complex processes that can actually that's that's inefficient right. So you're looping through a bunch of images couple times what this type function does is it groups. All the functions into one. So basically it's just like nesting the groups or sorry nesting the functions.

00:10:12.640 --> 00:10:15.870

Markert, Kel (MSFC-ST11)[UAH]

And then it just loops through the data set once.

00:10:17.070 --> 00:10:36.930

Markert, Kel (MSFC-ST11)[UAH]

So it's much more efficient in terms of scaling and you will prevent the and for the most part, too many concurrent aggregations or prevents your computation timeout errors, so that's usually and when I'm running things for like processing or you know.

00:10:38.220 --> 00:10:43.940

Markert, Kel (MSFC-ST11)[UAH]

When I'm running things to export over large time periods or or large areas. This is what I'd just default to.

00:10:45.070 --> 00:10:57.410

Markert, Kel (MSFC-ST11)[UAH]

And so the apply function is usually just kind of like a for me. It's just kind of like a illustration and and and step through thing and this dot pipe is really where you wanting to actually run the process.

00:10:58.180 --> 00:10:58.810

Markert, Kel (MSFC-ST11)[UAH]

Uhm.

00:10:59.830 --> 00:11:21.300

Markert, Kel (MSFC-ST11)[UAH]

Yo, if this isn't if this isn't necessarily working on it, you can also try and I say if possible, because sometimes what you're trying to do may not allow for it. But if possible, run for smaller time or geographic region. And so there's a way that you can if you only try and export for a small area.

00:11:22.380 --> 00:11:23.210

Markert, Kel (MSFC-ST11)[UAH]

And basically.

00:11:24.100 --> 00:11:31.290

Markert, Kel (MSFC-ST11)[UAH]

A breakout year exports into small areas, then that actually helps and runs things.

00:11:31.950 --> 00:11:32.530

Markert, Kel (MSFC-ST11)[UAH]

Uhm.

00:11:33.530 --> 00:11:38.110

Markert, Kel (MSFC-ST11)[UAH]

Or if you just you know only try and run data for one day kind of thing.

00:11:38.640 --> 00:11:44.230

Markert, Kel (MSFC-ST11)[UAH]

Check out the distinguishing factor you said between pipe and the apply function was.

00:11:45.360 --> 00:11:57.410

Markert, Kel (MSFC-ST11)[UAH]

Play functoids like goes through each layer and as it wears pipe kind of does them all simultaneously is that right or yeah, just repeating your question so everybody can hear the?

00:11:57.460 --> 00:12:09.100

Markert, Kel (MSFC-ST11)[UAH]

The UM the question was what? What is the distinguishing factor between the applied funk and and pipe and apply funk or you know?

00:12:09.920 --> 00:12:19.610

Markert, Kel (MSFC-ST11)[UAH]

Apply funk like like you said basically loops through every image for that one function right and so every time you use apply funk?

00:12:20.320 --> 00:12:28.550

Markert, Kel (MSFC-ST11)[UAH]

You're looping through all the images right so say you. You do apply funk 3 times as 3 times looping through all the images, which is a lot right.

00:12:29.440 --> 00:12:39.950

Markert, Kel (MSFC-ST11)[UAH]

The pipe function when you when you use this and you'll basically tell hydroflex kind of like? What functions you want it to use it?

00:12:40.000 --> 00:12:49.450

Markert, Kel (MSFC-ST11)[UAH]

Grouping the functions, yeah, it's yeah, it's grouping. The function so it only has to loop through the image. The image collection. Once that's right, which makes it more efficient.

00:12:51.160 --> 00:12:51.640

Markert, Kel (MSFC-ST11)[UAH]

Uhm.

00:12:52.640 --> 00:12:54.260

Markert, Kel (MSFC-ST11)[UAH]

OK, good question thanks Sir.

00:12:55.070 --> 00:13:07.660

Markert, Kel (MSFC-ST11)[UAH]

Of that, so the the 3rd option. I would say is if possible, export immediate intermediate results and what I mean by that is so if you're if you're having to go back and Recompute, something a bunch of times.

00:13:08.550 --> 00:13:37.930

Markert, Kel (MSFC-ST11)[UAH]

You know just it might as well. You might as well, just export that so that way. You can go back and and see what it is so for example, on Wednesday. Right we went through, and created that surface water map right. But then at the first part for the review and then later on. We actually pulled in that surface water map and used for the flood

mapping. That's what I mean by export intermediate results so we were using that that one water map so that way we weren't trying to.

00:13:38.610 --> 00:13:51.880

Markert, Kel (MSFC-ST11)[UAH]

Uh do all those computations and then pack on top more flood mapping or the flood mapping part. We were just saying like hey. We have a base data set. Let's just use that and then everything else on top of that.

00:13:52.660 --> 00:13:53.170

Markert, Kel (MSFC-ST11)[UAH]

Uhm.

00:13:54.400 --> 00:14:13.000

Markert, Kel (MSFC-ST11)[UAH]

And the 4th one this one can be quite controversial depending on your views of things. But the 4th option is run your computations at a lower scale or lower resolution so if you notice. I think someone asked on Monday, about that scale parameter.

00:14:13.930 --> 00:14:22.060

Markert, Kel (MSFC-ST11)[UAH]

But we'll we'll show an example here, but basically scale is like what level or like what?

00:14:22.930 --> 00:14:42.260

Markert, Kel (MSFC-ST11)[UAH]

Scale is the the resolution in meters that you want to do some sort of reduction or or aggregation. And so in that case. If you use like the native resolution you're basically requesting all like you know native resolution pixels and trying to do the operations on that which you know can.

00:14:43.950 --> 00:14:58.030

Markert, Kel (MSFC-ST11)[UAH]

You know it kind of defeats. The purpose of the whole earth engine computation model. So when you do it when you when you're processing. You can usually request a lower or it's a It's a higher value, but it's lower scale.

00:14:58.880 --> 00:14:59.470

Markert, Kel (MSFC-ST11)[UAH]

Uhm.

00:15:00.670 --> 00:15:17.300

Markert, Kel (MSFC-ST11)[UAH]

To do the computations and you're not really losing any information when you're doing like like means or or actually sampling the histograms and it gives you more or less the same results, but runs faster and that actually prevents some of these computation timeouts, and stuff.

00:15:19.830 --> 00:15:23.880

Markert, Kel (MSFC-ST11)[UAH]

OK, I think that's all I had any questions on on that.

00:15:24.940 --> 00:15:29.360

Markert, Kel (MSFC-ST11)[UAH]

Uh you know what I just completely forgot to do recording.

00:15:29.950 --> 00:15:30.540

Markert, Kel (MSFC-ST11)[UAH]

I don't know.

00:15:32.400 --> 00:15:33.590

Markert, Kel (MSFC-ST11)[UAH]

You hit record oh.

00:15:41.090 --> 00:15:42.190

Markert, Kel (MSFC-ST11)[UAH]

Magnus anything.

00:15:45.420 --> 00:15:46.440

Markert, Kel (MSFC-ST11)[UAH]

That's why I keep her around.

00:15:48.610 --> 00:15:50.480

Markert, Kel (MSFC-ST11)[UAH]

OK, so.

00:15:51.780 --> 00:15:56.290

Markert, Kel (MSFC-ST11)[UAH]

More fun cat GIFs. This is why I feel like sometimes when I'm trying to like get things done.

00:15:57.620 --> 00:16:00.190

Markert, Kel (MSFC-ST11)[UAH]

OK so if you're if you're following along.

00:16:01.200 --> 00:16:04.150

Markert, Kel (MSFC-ST11)[UAH]

You can go ahead and open up the.

00:16:05.060 --> 00:16:08.760

Markert, Kel (MSFC-ST11)[UAH]

I'm gonna actually close out of this so that way it's not an presentation mode.

00:16:10.270 --> 00:16:18.840

Markert, Kel (MSFC-ST11)[UAH]

Uhm OK, so we've seen this before. This is just colab notebooks and we're going to walk through the process so.

00:16:18.890 --> 00:16:22.460

Markert, Kel (MSFC-ST11)[UAH]

So you know to get started well, we will connect.

00:16:24.720 --> 00:16:36.340

Markert, Kel (MSFC-ST11)[UAH]

And there, we go. I'm connected and and then you know this is same process where we're bouncing our Google Drive. I'd give it this guy sign in.

00:16:38.080 --> 00:16:44.950

Markert, Kel (MSFC-ST11)[UAH]

Once you signed in and say authorize you'll just copy this authentication code and.

00:16:45.840 --> 00:16:47.200

Markert, Kel (MSFC-ST11)[UAH]

Plot that guy in there.

00:16:53.840 --> 00:16:58.540

Markert, Kel (MSFC-ST11)[UAH]

And then we'll we'll we will install the packages.

00:17:07.330 --> 00:17:10.800

Markert, Kel (MSFC-ST11)[UAH]

Again, it will tell you, you need to restart but don't worry about that.

00:17:10.860 --> 00:17:11.070

Markert, Kel (MSFC-ST11)[UAH]

Yeah.

00:17:11.780 --> 00:17:12.430

Markert, Kel (MSFC-ST11)[UAH]

Uhm.

00:17:16.020 --> 00:17:17.810

Markert, Kel (MSFC-ST11)[UAH]

Still, don't know why it does, that, but

00:17:21.500 --> 00:17:30.510

Markert, Kel (MSFC-ST11)[UAH]

uh I'm gonna closeout that so now we have our 100 floods stuff we're going to import the packages.

00:17:31.600 --> 00:17:46.330

Markert, Kel (MSFC-ST11)[UAH]

And we are going to kick off that authentication workflow for Earth engine and so I think it has my credentials in there already. But if you don't already have your credentials. You'll just do that authentication workflow that we just did.

00:17:47.140 --> 00:17:48.990

Markert, Kel (MSFC-ST11)[UAH]

Uh when doing the Google Drive.

00:17:52.270 --> 00:17:52.860

Markert, Kel (MSFC-ST11)[UAH]

OK.

00:17:54.540 --> 00:17:55.480

Markert, Kel (MSFC-ST11)[UAH]

So I

00:17:56.360 --> 00:18:00.700

Markert, Kel (MSFC-ST11)[UAH]

I tried very hard to find cases where it would fail.

00:18:01.470 --> 00:18:08.610

Markert, Kel (MSFC-ST11)[UAH]

Uh so bear with me on this some sometimes it might run sometimes it might not. We'll see.

00:18:10.480 --> 00:18:11.040

Markert, Kel (MSFC-ST11)[UAH]

You know.

00:18:12.080 --> 00:18:15.050

Markert, Kel (MSFC-ST11)[UAH]

I I will say sometimes with Earth engine. It's

00:18:16.590 --> 00:18:34.670

Markert, Kel (MSFC-ST11)[UAH]

you know it's sometimes hard to see where things like if you're getting a computation time out or too many concurrent aggregations. It's hard to tell where that's coming from because there's you know all that is obscured from the user and it's all on their infrastructure.

00:18:35.860 --> 00:18:38.860

Markert, Kel (MSFC-ST11)[UAH]

So it's sometimes hard to tell like.

00:18:40.780 --> 00:18:43.560

Markert, Kel (MSFC-ST11)[UAH]

What you can do to make that happen and so?

00:18:45.000 --> 00:19:07.610

Markert, Kel (MSFC-ST11)[UAH]

You know these these for these 4 kind of options that I that I gave you to prevent that are good guidelines to prevent it. But I don't know how to make it happen. A lot of times so anyways, So what we're going to do is we're going to try and process. Landsat imagery for all of this is all of Central America, including Mexico for 6 months.

00:19:08.750 --> 00:19:12.960

Markert, Kel (MSFC-ST11)[UAH]

So we'll do that, well actually I'm just curious how many images.

00:19:18.130 --> 00:19:20.620

Markert, Kel (MSFC-ST11)[UAH]

OK, 2861 that's a lot.

00:19:22.100 --> 00:19:41.920

Markert, Kel (MSFC-ST11)[UAH]

Uhm OK and just to kind of illustrate the errors that you can get with when there's no when there's no data to sample for your histogram. We're just going to filter for cloud cover using this dot filter function and we're actually going to say anything greater than 90.

00:19:42.960 --> 00:19:45.470

Markert, Kel (MSFC-ST11)[UAH]

Percent cloud cover which is really cloudy.

00:19:46.800 --> 00:19:47.620

Markert, Kel (MSFC-ST11)[UAH]

So we're going to do that.



00:19:47.680 --> 00:19:54.960

Markert, Kel (MSFC-ST11)[UAH]

Shut up and then just just show you what it looks like we're going to mosaic and display it on the map.

00:19:57.440 --> 00:19:58.440

Markert, Kel (MSFC-ST11)[UAH]

If there's any data.

00:20:00.340 --> 00:20:01.490

Markert, Kel (MSFC-ST11)[UAH]

May not even be data.

00:20:05.530 --> 00:20:07.380

Markert, Kel (MSFC-ST11)[UAH]

OK, so.

00:20:09.170 --> 00:20:15.880

Markert, Kel (MSFC-ST11)[UAH]

Theoretically, we should have data all over Mexico. We can go back and look at it in this other case, or so go back and look at it.

00:20:16.430 --> 00:20:26.700

Markert, Kel (MSFC-ST11)[UAH]

So, just to just to illustrate right so here we're calculating our water index again. And here we're trying to apply that edge otsu function to each image right.

00:20:27.640 --> 00:20:35.110

Markert, Kel (MSFC-ST11)[UAH]

Uh and then we're going to mosaic it into a dual mode reduction and try and run it.

00:20:45.270 --> 00:20:51.610

Markert, Kel (MSFC-ST11)[UAH]

Slightly unrelated question, but packet Python packages making Maps that is uh.

00:20:52.480 --> 00:20:54.150

Markert, Kel (MSFC-ST11)[UAH]

Package called GE map.

00:20:54.990 --> 00:21:07.900

Markert, Kel (MSFC-ST11)[UAH]

Uhm there's yeah, so this package was specifically like meant for Earth engine Maps. But the guy who developed it made another package called leaf map so.

00:21:08.050 --> 00:21:10.730

Markert, Kel (MSFC-ST11)[UAH]

At least leaf Mapinfo Liam Yeah.

00:21:11.820 --> 00:21:23.320

Markert, Kel (MSFC-ST11)[UAH]

Yeah, they're all kind of like I think leaf map and GE or sorry. GE map and leaf map. I think they're on Pypi Leaflet, so yeah.

00:21:25.000 --> 00:21:39.890

Markert, Kel (MSFC-ST11)[UAH]

OK so yeah, so here we go, we got our error where our dictionary does not contain key bucket means so you can get this when there's no data. I'll actually try and show an example where you can get that.

00:21:41.770 --> 00:21:42.980

Markert, Kel (MSFC-ST11)[UAH]

Error again.

00:21:43.850 --> 00:22:13.780

Markert, Kel (MSFC-ST11)[UAH]

Uh OK, so usually when that happens and you're really happy with so this is again extreme case. We just basically said make note data at all, So what you can do is you can take the edge. Otsu function has a keyword parameter called thresh node data, which means threshold in the case of no data and so we're just going to set that by default. That's turned off because you don't usually you don't want to have like that.

00:22:13.850 --> 00:22:20.320

Markert, Kel (MSFC-ST11)[UAH]

Fall back case, but and in some cases when you're trying to run automated processing. You want to have this.

00:22:21.580 --> 00:22:30.050

Markert, Kel (MSFC-ST11)[UAH]

And so we can run we can provide that thresh no data into this function and then it would theoretically run.

00:22:31.180 --> 00:22:48.610

Markert, Kel (MSFC-ST11)[UAH]

There's no data there, but it runs right OK, so I'll provide another example where let's say. I'm going to comment.

This out and actually do some coding or change some of our variables.

00:22:49.600 --> 00:22:54.210

Markert, Kel (MSFC-ST11)[UAH]

And So what it would actually look like if we processed all of this stuff is.

00:22:54.860 --> 00:22:55.290

Markert, Kel (MSFC-ST11)[UAH]

This.

00:22:56.960 --> 00:22:57.310

Markert, Kel (MSFC-ST11)[UAH]

Right.

00:22:58.650 --> 00:22:59.730

Markert, Kel (MSFC-ST11)[UAH]

So that's a lot of data.

00:23:02.570 --> 00:23:04.340

Markert, Kel (MSFC-ST11)[UAH]

OK, so.

00:23:05.820 --> 00:23:16.630

Markert, Kel (MSFC-ST11)[UAH]

Again, we're calculating our water index, so I'm going to remove this threshold. Note data but I'm going to bump our initial threshold till like 9 to you right away.

00:23:18.100 --> 00:23:25.880

Markert, Kel (MSFC-ST11)[UAH]

So this is a case where you may have your inputs wrong right so if you're you know 0.9 is really high.

00:23:25.930 --> 00:23:36.560

Markert, Kel (MSFC-ST11)[UAH]

Buy a water index, UM and so in the case of this. This this function what it does again is tries to find out you know what's?

00:23:37.370 --> 00:23:43.430

Markert, Kel (MSFC-ST11)[UAH]

Uh you know binary right, it does it uses this to find a binary threshold and then tries to sample and stuff?

00:23:44.240 --> 00:23:44.850

Markert, Kel (MSFC-ST11)[UAH]

Uhm.

00:23:46.500 --> 00:23:49.120

Markert, Kel (MSFC-ST11)[UAH]

Actually, sorry it should be -0.9.

00:23:50.230 --> 00:23:55.800

Markert, Kel (MSFC-ST11)[UAH]

If you go above it. I think it's a little OK, but if you go under it, it might not work.

00:23:56.730 --> 00:23:57.400

Markert, Kel (MSFC-ST11)[UAH]

So.

00:23:59.510 --> 00:24:00.460

Markert, Kel (MSFC-ST11)[UAH]

Try that again.

00:24:01.960 --> 00:24:17.390

Markert, Kel (MSFC-ST11)[UAH]

So, in this case, we're trying to basically simulate a case where you provide a threshold, but no data within you know the data set meets that threshold. And so it's going to give you an error right. This is just showing edge cases.

00:24:18.550 --> 00:24:21.800

Markert, Kel (MSFC-ST11)[UAH]

Yep, dictionary does not contain key bucket means.

00:24:23.260 --> 00:24:27.720

Markert, Kel (MSFC-ST11)[UAH]

So again in the in that case you can provide this thresh node data.

00:24:32.030 --> 00:24:35.540

Markert, Kel (MSFC-ST11)[UAH]

And it basically falls back to a threshold of zero.

00:24:41.780 --> 00:24:43.610

Markert, Kel (MSFC-ST11)[UAH]

We will see how fast this goes.

00:24:45.740 --> 00:24:49.170

Markert, Kel (MSFC-ST11)[UAH]

It's interesting that some parts of whereas this.

00:24:54.050 --> 00:24:55.060

Markert, Kel (MSFC-ST11)[UAH]

Lisa.

00:25:00.250 --> 00:25:02.760

Markert, Kel (MSFC-ST11)[UAH]

For some reason, it's just kind of stuck.

00:25:05.870 --> 00:25:07.780

Markert, Kel (MSFC-ST11)[UAH]

Anyways let's trying to turn on and off the.

00:25:09.240 --> 00:25:09.830

Markert, Kel (MSFC-ST11)[UAH]

The math.

00:25:11.250 --> 00:25:13.630

Markert, Kel (MSFC-ST11)[UAH]

Somewhere in here, I think that's Nicaragua.

00:25:14.760 --> 00:25:15.370

Markert, Kel (MSFC-ST11)[UAH]

Very cloudy.

00:25:16.980 --> 00:25:18.550

Markert, Kel (MSFC-ST11)[UAH]

But I'll just try zooming in.

00:25:19.380 --> 00:25:21.990

Markert, Kel (MSFC-ST11)[UAH]

And seeing if that actually runs the computation.

00:25:24.270 --> 00:25:43.840

Markert, Kel (MSFC-ST11)[UAH]

So, in in these cases, you know, providing that threshold. Note data actually does help prevent the case 2 where you may have not only you know data but also variable data and so you know just kind of catching those so it's really like a fall back. I'm making your workflows robust.

00:25:45.980 --> 00:25:47.620

Markert, Kel (MSFC-ST11)[UAH]

OK, UM.

00:25:50.050 --> 00:25:53.040

Markert, Kel (MSFC-ST11)[UAH]

Any questions on on some of that.

00:25:53.730 --> 00:25:58.060

Markert, Kel (MSFC-ST11)[UAH]

So I do want to reiterate so these.

00:25:59.500 --> 00:26:08.350

Markert, Kel (MSFC-ST11)[UAH]

These cases are some of like the more or not reiterate but I guess like explain a little further. But these cases are some of the some of the cases that we've experienced.

00:26:09.320 --> 00:26:14.130

Markert, Kel (MSFC-ST11)[UAH]

That's not to say that these are the only edge cases or you know.

00:26:14.720 --> 00:26:28.060

Markert, Kel (MSFC-ST11)[UAH]

Error cases so they're they're probably could be a little bit. Other ways to make your workflows a little bit more robust. But at at as a first order, you know this could be. You know just nice to include again, it's turned off by default.

00:26:29.790 --> 00:26:30.280

Markert, Kel (MSFC-ST11)[UAH]

But.

00:26:31.600 --> 00:26:31.880

Markert, Kel (MSFC-ST11)[UAH]

Yeah.

00:26:34.840 --> 00:26:36.340

Markert, Kel (MSFC-ST11)[UAH]

OK, any questions on that.

00:26:38.690 --> 00:26:39.040

Markert, Kel (MSFC-ST11)[UAH]

OK.

00:26:39.960 --> 00:26:47.620

Markert, Kel (MSFC-ST11)[UAH]

Yeah, and again the whole idea is just trying to like prevent errors in the case of running massive computations OK so.

00:26:47.790 --> 00:27:00.110

Markert, Kel (MSFC-ST11)[UAH]

Uhm this case so preventing errors with our processing with are you usually don't have to deal with the issue that there's no data because you're usually going to get an image all the time.

00:27:00.980 --> 00:27:06.580

Markert, Kel (MSFC-ST11)[UAH]

But what happens is is we're pulling in multiple data streams with our so you just kind of want to make sure everything is.

00:27:07.030 --> 00:27:12.810

Markert, Kel (MSFC-ST11)[UAH]

Uhm qaid that that you're using so that way it can actually process.

00:27:14.260 --> 00:27:19.660

Markert, Kel (MSFC-ST11)[UAH]

So here we're going to get some data over the Dominican Republic. This is one of the.

00:27:21.270 --> 00:27:27.600

Markert, Kel (MSFC-ST11)[UAH]

This is the case that I was showing here where you this is Dominican Republic up here where you have a?

00:27:28.740 --> 00:27:31.110

Markert, Kel (MSFC-ST11)[UAH]

You know image that's just completely over the ocean.

00:27:32.260 --> 00:27:36.760

Markert, Kel (MSFC-ST11)[UAH]

Uhm and so we'll grab the a sending.

00:27:37.250 --> 00:27:39.610

Markert, Kel (MSFC-ST11)[UAH]

Uh part of Sentinel One.

00:27:40.530 --> 00:27:54.230

Markert, Kel (MSFC-ST11)[UAH]

And so remember to do our to do our Sentinel, one processing. We usually bring in a DMS to do that terrain flattening. It's very corrections so in this case. We're going to do that, and I mentioned earlier that our DMS are just masked out.

00:27:55.410 --> 00:27:58.160

Markert, Kel (MSFC-ST11)[UAH]

Over the oceans that's just typically how they work.

00:27:59.330 --> 00:28:03.780

Markert, Kel (MSFC-ST11)[UAH]

And so we're just going to do our process and we are going to try and.

00:28:05.040 --> 00:28:12.480

Markert, Kel (MSFC-ST11)[UAH]

Oh. Sorry. So here we are this is the unprocessed. SAR data just to show what it should look like.

00:28:14.190 --> 00:28:16.480

Markert, Kel (MSFC-ST11)[UAH]

And here is the process our data.

00:28:18.720 --> 00:28:20.070

Markert, Kel (MSFC-ST11)[UAH]

And.

00:28:20.880 --> 00:28:25.530

Markert, Kel (MSFC-ST11)[UAH]

We will wait and wait and wait and wait and nothing will happen.

00:28:26.950 --> 00:28:28.700

Markert, Kel (MSFC-ST11)[UAH]

So this is like one of my more.

00:28:29.600 --> 00:28:44.170

Markert, Kel (MSFC-ST11)[UAH]

Least favorite errors, where it gives you a map. It says I can process data but then once it tries to get data. It's like no there's no data and I don't know why it does, that, but it does it so.

00:28:45.760 --> 00:28:51.130

Markert, Kel (MSFC-ST11)[UAH]

If you didn't know about this error. You could be sitting here for a while and wondering where is my data.

00:28:52.060 --> 00:28:53.670

Markert, Kel (MSFC-ST11)[UAH]

Uh so.

00:28:54.650 --> 00:28:55.930

Markert, Kel (MSFC-ST11)[UAH]

To simply fix that.

00:28:56.500 --> 00:29:10.140

Markert, Kel (MSFC-ST11)[UAH]

Uhm what you want to do is provide a just a fill value over oceans. And this case to do that. We use a earth engine function called unmask and basically that says anywhere that there's a mask.

00:29:10.970 --> 00:29:13.410

Markert, Kel (MSFC-ST11)[UAH]

Uh give it a value of zero.

00:29:14.580 --> 00:29:16.690

Markert, Kel (MSFC-ST11)[UAH]

And so we can go back and reprocess it.

00:29:18.210 --> 00:29:22.140

Markert, Kel (MSFC-ST11)[UAH]

And again that's what it should look like and then we go and hit run.

00:29:26.540 --> 00:29:28.560

Markert, Kel (MSFC-ST11)[UAH]

Uh and

00:29:30.230 --> 00:29:31.210

Markert, Kel (MSFC-ST11)[UAH]

should process.

00:29:37.120 --> 00:29:37.980

Markert, Kel (MSFC-ST11)[UAH]

Do that right.

00:29:40.890 --> 00:29:41.500

Markert, Kel (MSFC-ST11)[UAH]

Yes.

00:29:43.340 --> 00:29:44.310

Markert, Kel (MSFC-ST11)[UAH]

Mayor of zoom in.

00:29:46.260 --> 00:29:47.030

Markert, Kel (MSFC-ST11)[UAH]

There we go.

00:29:49.620 --> 00:29:50.750

Markert, Kel (MSFC-ST11)[UAH]

Just trying to do a lot.

00:29:55.020 --> 00:29:55.470

Markert, Kel (MSFC-ST11)[UAH]

I don't know why.

00:29:56.820 --> 00:29:59.190

Markert, Kel (MSFC-ST11)[UAH]

Anyways so it runs.

00:30:00.710 --> 00:30:01.440

Markert, Kel (MSFC-ST11)[UAH]

In this case.

00:30:03.710 --> 00:30:12.250

Markert, Kel (MSFC-ST11)[UAH]

So basically the point is here that when you're trying to merge multiple data streams and trying to process things.

00:30:13.100 --> 00:30:21.730

Markert, Kel (MSFC-ST11)[UAH]

Uh just QA all of your data and think about some of the cases where you can have you know.

00:30:24.130 --> 00:30:24.880

Markert, Kel (MSFC-ST11)[UAH]

There.

00:30:26.630 --> 00:30:28.150

Markert, Kel (MSFC-ST11)[UAH]

So I'm trying to think about how to explain.

00:30:29.540 --> 00:30:46.170

Markert, Kel (MSFC-ST11)[UAH]

So with the with the remote sensing data, set, I think it's OK to have like masked areas. As long as you're handling those but with like answering datasets like DeepMind stuff that you're pulling in usually just want to kind of see way and make sure those are all those all have data.

00:30:49.120 --> 00:30:51.080  
Markert, Kel (MSFC-ST11)[UAH]  
OK, any questions on that part.  
00:30:53.400 --> 00:30:56.810  
Markert, Kel (MSFC-ST11)[UAH]  
OK, so this is where I was trying to break things and.  
00:30:57.470 --> 00:30:59.140  
Markert, Kel (MSFC-ST11)[UAH]  
We'll see what happens.  
00:31:00.320 --> 00:31:07.080  
Markert, Kel (MSFC-ST11)[UAH]  
Uhm OK again so we're going to process all of Central America and we're going to process for 11 months.  
00:31:08.030 --> 00:31:09.680  
Markert, Kel (MSFC-ST11)[UAH]  
Why not? Why not entire year?  
00:31:13.510 --> 00:31:18.760  
Markert, Kel (MSFC-ST11)[UAH]  
OK so we're going to process we're going to try and process an entire year of The Sentinel, one ascending and descending.  
00:31:22.340 --> 00:31:22.830  
Markert, Kel (MSFC-ST11)[UAH]  
Sorry.  
00:31:26.880 --> 00:31:32.330  
Markert, Kel (MSFC-ST11)[UAH]  
Correct so you know this is the same process where we're trying to apply the function.  
00:31:33.140 --> 00:31:40.900  
Markert, Kel (MSFC-ST11)[UAH]  
Uh we're we're trained flattening we're doing spectral filter and then I'm just doing this aggregation process to help with the visualization.  
00:31:42.400 --> 00:31:44.340  
Markert, Kel (MSFC-ST11)[UAH]  
Never mapping water here.  
00:31:45.650 --> 00:31:48.880  
Markert, Kel (MSFC-ST11)[UAH]  
Right just typical thing where we've actually left.  
00:31:49.040 --> 00:31:50.410  
Markert, Kel (MSFC-ST11)[UAH]  
Uh hum.  
00:31:51.590 --> 00:32:01.420  
Markert, Kel (MSFC-ST11)[UAH]  
Actually, I'm going to cancel that we'll see what happens, I'm going to request that the skill be processed at you know very near native resolution which is.  
00:32:02.150 --> 00:32:06.760  
Markert, Kel (MSFC-ST11)[UAH]  
Uh around 30 meters so we're gonna run that and see what happens.  
00:32:07.740 --> 00:32:15.880  
Markert, Kel (MSFC-ST11)[UAH]  
If you follow this little triangle or this little arrow on the side here and it'll actually tell you, which part of the computation it's on.  
00:32:17.050 --> 00:32:20.300  
Markert, Kel (MSFC-ST11)[UAH]  
So he can see that's kind of hung up for a bit on this part.

00:32:21.920 --> 00:32:22.790

Markert, Kel (MSFC-ST11)[UAH]

Well let that run.

00:32:30.570 --> 00:32:32.780

Markert, Kel (MSFC-ST11)[UAH]

Questions feel like I'm breezing through this.

00:32:36.390 --> 00:32:37.620

Markert, Kel (MSFC-ST11)[UAH]

Is it just makes sense?

00:32:41.110 --> 00:32:42.020

Markert, Kel (MSFC-ST11)[UAH]

Miscellaneous.

00:32:43.770 --> 00:32:47.740

Markert, Kel (MSFC-ST11)[UAH]

Don't steal the document trying to break it up into bite size.

00:32:48.880 --> 00:32:49.310

Markert, Kel (MSFC-ST11)[UAH]

Yeah.

00:32:51.170 --> 00:32:52.060

Markert, Kel (MSFC-ST11)[UAH]

Edge and trying to

00:32:53.180 --> 00:32:56.450

Markert, Kel (MSFC-ST11)[UAH]

code this up during a ipython session.

00:32:59.010 --> 00:33:00.090

Markert, Kel (MSFC-ST11)[UAH]

In participants.

00:33:00.140 --> 00:33:00.390

Markert, Kel (MSFC-ST11)[UAH]

Yeah.

00:33:07.830 --> 00:33:08.500

Markert, Kel (MSFC-ST11)[UAH]

Expired.

00:33:18.810 --> 00:33:19.060

Markert, Kel (MSFC-ST11)[UAH]

Yeah.

00:33:22.400 --> 00:33:27.550

Markert, Kel (MSFC-ST11)[UAH]

OK, any questions, while this is waiting. I mean, it doesn't have to be a question about this stuff, it could just be a general question.

00:33:28.600 --> 00:33:31.110

Markert, Kel (MSFC-ST11)[UAH]

Yeah, maybe what's my favorite food, I don't know.

00:33:37.040 --> 00:33:40.680

Markert, Kel (MSFC-ST11)[UAH]

Anybody have any particularly fun plans for the weekend that they want to share.

00:33:44.750 --> 00:33:45.250

Markert, Kel (MSFC-ST11)[UAH]

No.

00:33:46.160 --> 00:33:49.220

Markert, Kel (MSFC-ST11)[UAH]

It snowed here in Utah, so go skiing.



00:33:49.500 --> 00:33:49.820

Markert, Kel (MSFC-ST11)[UAH]

Yeah.

00:33:50.080 --> 00:33:50.740

Markert, Kel (MSFC-ST11)[UAH]

Almost.

00:33:51.770 --> 00:33:52.030

Markert, Kel (MSFC-ST11)[UAH]

Right.

00:33:54.480 --> 00:34:00.720

Markert, Kel (MSFC-ST11)[UAH]

I underwent it. Everybody just gonna like digesting this and over the weekend. They're going to go back and do more hydrophilic stuff.

00:34:00.770 --> 00:34:01.380

Markert, Kel (MSFC-ST11)[UAH]

I'm glad.

00:34:03.860 --> 00:34:06.480

Markert, Kel (MSFC-ST11)[UAH]

I didn't wanna say that so we didn't offend you kill.

00:34:09.210 --> 00:34:12.400

Markert, Kel (MSFC-ST11)[UAH]

That's why we're all quiet about our plans for the yeah.

00:34:15.160 --> 00:34:21.580

Markert, Kel (MSFC-ST11)[UAH]

OK, I know this is taking awhile it's for demonstration purposes.

00:34:22.850 --> 00:34:28.810

Markert, Kel (MSFC-ST11)[UAH]

So while that's running I can just go ahead and come down and and talk about it. This this.

00:34:29.020 --> 00:34:35.470

Markert, Kel (MSFC-ST11)[UAH]

A lower section so you know, we talked about this in the in the slides here.

00:34:37.180 --> 00:34:37.790

Markert, Kel (MSFC-ST11)[UAH]

Uhm.

00:34:39.960 --> 00:34:47.480

Markert, Kel (MSFC-ST11)[UAH]

Yeah, we basically went to Step 4, here on like trying to make it run by relaxing the computation scale.

00:34:48.040 --> 00:34:59.270

Markert, Kel (MSFC-ST11)[UAH]

Uh you know just for demonstration purposes. We're gonna leave these 2 and then we'll talk about the pipe function later. So we're going to go. Just go ahead and skip over thing go to computation.

00:35:00.430 --> 00:35:06.010

Markert, Kel (MSFC-ST11)[UAH]

Usually come all the functions that allow you to control the scale of computation will have this.

00:35:06.940 --> 00:35:07.540

Markert, Kel (MSFC-ST11)[UAH]

It ran.

00:35:09.930 --> 00:35:10.210

Markert, Kel (MSFC-ST11)[UAH]

Yeah.

00:35:12.040 --> 00:35:17.050

Markert, Kel (MSFC-ST11)[UAH]

I still find this a little ridiculous this just ran for all of Central America for an entire year.

00:35:20.250 --> 00:35:24.760

Markert, Kel (MSFC-ST11)[UAH]

Granted, it probably won't give you well see what happens if I had just your mouth.

00:35:26.010 --> 00:35:27.610

Markert, Kel (MSFC-ST11)[UAH]

It will load I don't know.

00:35:29.990 --> 00:35:32.200

Markert, Kel (MSFC-ST11)[UAH]

So just imagine that it failed.

00:35:33.930 --> 00:35:34.560

Markert, Kel (MSFC-ST11)[UAH]

Uhm.

00:35:36.590 --> 00:35:38.010

Markert, Kel (MSFC-ST11)[UAH]

Let's see if I can try and get it to fail.

00:35:38.500 --> 00:35:40.910

Markert, Kel (MSFC-ST11)[UAH]

2 years 2 years, maybe.

00:35:42.440 --> 00:35:43.270

Markert, Kel (MSFC-ST11)[UAH]

2 years.

00:35:47.080 --> 00:35:48.390

Markert, Kel (MSFC-ST11)[UAH]

Actually, I'm gonna stop that.

00:35:50.400 --> 00:35:50.940

Markert, Kel (MSFC-ST11)[UAH]

Stop.

00:35:54.110 --> 00:35:58.600

Markert, Kel (MSFC-ST11)[UAH]

I'm just going to show the the raw data so that way we can kind of see what's going on here?

00:35:59.450 --> 00:35:59.830

Markert, Kel (MSFC-ST11)[UAH]

Really?

00:36:03.920 --> 00:36:12.060

Markert, Kel (MSFC-ST11)[UAH]

OK so while we're trying to break things up. You know moving on, you know the idea is assuming that that would fail.

00:36:12.650 --> 00:36:23.720

Markert, Kel (MSFC-ST11)[UAH]

Uh if you relax this scale parameter so up here. We have it set at 30. That means process. Everything at 30 meter resolution and we are doing our.

00:36:25.580 --> 00:36:27.950

Markert, Kel (MSFC-ST11)[UAH]

Not process everything but basically when we're doing.

00:36:28.030 --> 00:36:32.420

Markert, Kel (MSFC-ST11)[UAH]

Or are here, we go too many concurrent aggregations.

00:36:34.400 --> 00:36:55.250

Markert, Kel (MSFC-ST11)[UAH]

So when we're actually doing our our histogram sampling in this case. This is where the scale comes into play. And so when you're when you set a scale at 34. These thresholding algorithms. You're sampling values at 30 meter resolution. And so you can see how it kind of ends up being a lot of data very quick right.

00:36:56.340 --> 00:37:08.090

Markert, Kel (MSFC-ST11)[UAH]

So if you basically say process at 3:00, 100 meter resolution here. It's by a factor of 10 right so in this case. Maybe it will run.

00:37:09.820 --> 00:37:16.730

Markert, Kel (MSFC-ST11)[UAH]

Is this one of those cases where last time you mentioned if it fails? You can just restart it and it kind of is.

00:37:16.780 --> 00:37:17.040

Markert, Kel (MSFC-ST11)[UAH]

Is?

00:37:18.110 --> 00:37:23.740

Markert, Kel (MSFC-ST11)[UAH]

Cute are not within Germany proper Cash Cash cash so.

00:37:24.770 --> 00:37:33.300

Markert, Kel (MSFC-ST11)[UAH]

Kind of like that, but maybe because you'd have to run it. So many more times. It would be practical. To actually get it done, yeah, so in this case well.

00:37:34.910 --> 00:37:37.710

Markert, Kel (MSFC-ST11)[UAH]

No this isn't that particular case so.

00:37:38.960 --> 00:37:40.730

Markert, Kel (MSFC-ST11)[UAH]

Usually, when you get a?

00:37:42.030 --> 00:37:50.010

Markert, Kel (MSFC-ST11)[UAH]

I just so usually when you get a too many concurrent aggregations, so like how earth engine works says like it says OK?

00:37:50.930 --> 00:37:51.610

Markert, Kel (MSFC-ST11)[UAH]

Uhm.

00:37:52.660 --> 00:38:02.710

Markert, Kel (MSFC-ST11)[UAH]

Basically, every process that I want you to do go onto another computer and once so it you know directed acyclic graphs.

00:38:03.900 --> 00:38:08.670

Markert, Kel (MSFC-ST11)[UAH]

That's the computation or that's how it like represents a computation so at each step, it says.

00:38:09.750 --> 00:38:19.130

Markert, Kel (MSFC-ST11)[UAH]

I have this many computations to do for this node in the in the dag go off do all this stuff aggregate. My results move to the next bits right.

00:38:20.260 --> 00:38:26.390

Markert, Kel (MSFC-ST11)[UAH]

So when you're doing, too many concurrent aggregations just trying to spawn too many processes across multiple servers.

00:38:28.800 --> 00:38:49.570

Markert, Kel (MSFC-ST11)[UAH]

The where you can rerun things is that computation timeout OK. So too many too many concurrent aggregations means you're trying to do too much computation timeout means you tried to do too much in the time allotted OK and So what you can do. There is then restart the process.

00:38:50.270 --> 00:38:57.250

Markert, Kel (MSFC-ST11)[UAH]

But theoretically if you're running something that's automated and running on a server you still like unless you have like?

00:38:57.860 --> 00:39:02.410

Markert, Kel (MSFC-ST11)[UAH]

Uh you know something set up to where it will like re submit a job.

00:39:03.860 --> 00:39:07.100

Markert, Kel (MSFC-ST11)[UAH]

Which I haven't really done so?

00:39:08.710 --> 00:39:12.760

Markert, Kel (MSFC-ST11)[UAH]

You want to kind of prevent those computation time out errors.

00:39:16.010 --> 00:39:18.670

Markert, Kel (MSFC-ST11)[UAH]

So I guess 2 years was too much.

00:39:20.250 --> 00:39:21.770

Markert, Kel (MSFC-ST11)[UAH]

Let's try one and a half years.

00:39:23.670 --> 00:39:27.890

Markert, Kel (MSFC-ST11)[UAH]

OK, I'm not gonna run that part because I served our purposes.

00:39:38.580 --> 00:39:44.920

Markert, Kel (MSFC-ST11)[UAH]

Relax how much we're doing. I mean really. I mean do you really want to process a year plus worth of data?

00:39:46.490 --> 00:39:48.680

Markert, Kel (MSFC-ST11)[UAH]

I mean, you can, but

00:39:50.610 --> 00:39:52.650

Markert, Kel (MSFC-ST11)[UAH]

practically speaking what are you going to get out of it?

00:39:53.940 --> 00:39:54.460

Markert, Kel (MSFC-ST11)[UAH]

So.

00:39:55.250 --> 00:39:55.820

Markert, Kel (MSFC-ST11)[UAH]

Uhm.

00:39:58.820 --> 00:39:59.780

Markert, Kel (MSFC-ST11)[UAH]

But good questions.

00:40:03.910 --> 00:40:04.640

Markert, Kel (MSFC-ST11)[UAH]

Keep them coming.

00:40:09.720 --> 00:40:11.650

Markert, Kel (MSFC-ST11)[UAH]

OK hope this runs.

00:40:14.270 --> 00:40:26.280

Markert, Kel (MSFC-ST11)[UAH]

And and I will say 2 like the Sentinel, I. I chose Sentinel, one for this case because it's very processing. Heavy like doing the train flattening and the speckled filtering it's quite a bit so ah, it ran.

00:40:27.420 --> 00:40:29.240

Markert, Kel (MSFC-ST11)[UAH]

So you could see that by.

00:40:29.290 --> 00:40:37.860

Markert, Kel (MSFC-ST11)[UAH]

Hey uh, yeah, we also only ran half of the OR you know remove 6 months from it, so in this case.

00:40:38.850 --> 00:40:39.380

Markert, Kel (MSFC-ST11)[UAH]

Uh.

00:40:41.350 --> 00:40:49.740

Markert, Kel (MSFC-ST11)[UAH]

Alright that was a year and a half. Yeah, that was a year and a half. Overall, Central America. Yeah, there, you go.

Here's your mean value for sorry.

00:40:52.120 --> 00:40:54.010

Markert, Kel (MSFC-ST11)[UAH]

That's pretty good in my opinion.

00:40:55.870 --> 00:40:56.450

Markert, Kel (MSFC-ST11)[UAH]

Uhm.

00:40:57.470 --> 00:41:08.180

Markert, Kel (MSFC-ST11)[UAH]

Again still amazed that really what Earth engine can do OK, so that ran but just to kind of illustrate how to do the piping functions maybe?

00:41:08.990 --> 00:41:14.260

Markert, Kel (MSFC-ST11)[UAH]

Maybe we can try doing the entire 2 years and see if it works for pipe.

00:41:15.920 --> 00:41:18.980

Markert, Kel (MSFC-ST11)[UAH]

'cause theoretically it's a little bit more efficient.

00:41:24.810 --> 00:41:25.600

Markert, Kel (MSFC-ST11)[UAH]

So.

00:41:27.990 --> 00:41:34.580

Markert, Kel (MSFC-ST11)[UAH]

If you noticed up here right we did the apply function apply function.

00:41:35.930 --> 00:41:39.360

Markert, Kel (MSFC-ST11)[UAH]

Uh apply function right the 3 steps.

00:41:41.310 --> 00:41:45.540

Markert, Kel (MSFC-ST11)[UAH]

So here what we're going to do, we're going to grab those 2 years worth of data?

00:41:46.710 --> 00:41:56.880

Markert, Kel (MSFC-ST11)[UAH]

And here we're defining a process right so in in Python. It's really nice. Because functions are variables functions or objects. We can use those as variables kind of thing.

00:41:57.750 --> 00:42:07.430

Markert, Kel (MSFC-ST11)[UAH]

So here basically what we're doing is the the set up is you provide it. Some iterable object, and in this case, we're giving it a tuple.

00:42:08.640 --> 00:42:09.330

Markert, Kel (MSFC-ST11)[UAH]

And.

00:42:10.360 --> 00:42:14.070

Markert, Kel (MSFC-ST11)[UAH]

Within that tuple is we, we provide the steps.

00:42:14.820 --> 00:42:20.190

Markert, Kel (MSFC-ST11)[UAH]

Right so you can see here it's kind of logically set up and step one Step 2 Step 3.

00:42:21.030 --> 00:42:52.420

Markert, Kel (MSFC-ST11)[UAH]

If the step needs some keyword parameters. You just provide it as another iterable it could be a list or tuple and you give it the function as a first argument as the first element and then the Dictionary of your keyword arguments as the second element right as you can see here for the slope correction. We need to provide the elevation and some buffer information. But for the spectral filtering. We don't need to provide any additional information. So we just leave it as is and it's just its own.

00:42:52.470 --> 00:42:52.940

Markert, Kel (MSFC-ST11)[UAH]

Kind of thing.

00:42:54.560 --> 00:42:59.270

Markert, Kel (MSFC-ST11)[UAH]

Right so I'm actually going to set this scale at 1:20.

00:42:59.920 --> 00:43:12.670

Markert, Kel (MSFC-ST11)[UAH]

To run so that's that's just setting up our process right so you know, just saying how we want to run things and so when we do this we can just basically one shot.

00:43:13.720 --> 00:43:33.900

Markert, Kel (MSFC-ST11)[UAH]

The whole process in one loop and so this is what we do here. So you have your this is just the raw data set right and then we have this pipe function and we give it those steps to run through and again what it does is it just takes all of those functions. It creates and just nests then so it's just one big function and says.

00:43:34.520 --> 00:43:37.450

Markert, Kel (MSFC-ST11)[UAH]

Loop through all the images and apply that one big function.

00:43:45.270 --> 00:43:45.580

Markert, Kel (MSFC-ST11)[UAH]

So.

00:43:47.020 --> 00:43:48.000

Markert, Kel (MSFC-ST11)[UAH]

I'm sorry.

00:43:48.210 --> 00:43:58.260

Markert, Kel (MSFC-ST11)[UAH]

This is the button that mean but you mean the button. I'll get it. Just doesn't have to know about everything. Yep,

Yep that's This is the button.

00:44:00.280 --> 00:44:01.510

Markert, Kel (MSFC-ST11)[UAH]

So process.

00:44:02.090 --> 00:44:03.340

Markert, Kel (MSFC-ST11)[UAH]

Correct yeah.

00:44:04.140 --> 00:44:04.840

Markert, Kel (MSFC-ST11)[UAH]

Uhm.

00:44:06.230 --> 00:44:22.060

Markert, Kel (MSFC-ST11)[UAH]

Yeah, so this is this is nice, I mean? What you don't get out of this is like those. This is why I haven't shown it earlier. It's because you don't get that nice step by step. You don't get the intermediate results. It's the black box. It is the black box, but it's inefficient black box.

00:44:23.910 --> 00:44:25.500

Markert, Kel (MSFC-ST11)[UAH]

So I think it's

00:44:26.910 --> 00:44:29.110

Markert, Kel (MSFC-ST11)[UAH]

it's a jewel covered black box.

00:44:29.360 --> 00:44:29.750

Markert, Kel (MSFC-ST11)[UAH]

There you go.

00:44:31.420 --> 00:44:32.860

Markert, Kel (MSFC-ST11)[UAH]

The Black Lamborghini.

00:44:34.700 --> 00:44:46.520

Markert, Kel (MSFC-ST11)[UAH]

No, I think when we're running this and for the mate. When we were setting this up and and during this 4 and the severe Mekong with WFP I think we were running things.

00:44:48.490 --> 00:45:09.200

Markert, Kel (MSFC-ST11)[UAH]

Basically, when we're doing the data Fusion stuff, Amanda like I had to chunk out until like I had to break Cambodia up into a grid and then export everything as it like on those smaller grids right remember how saying like use a smaller region. So we were trying to do a lot of data processing for just one day kind of thing.

00:45:10.010 --> 00:45:14.300

Markert, Kel (MSFC-ST11)[UAH]

And then it was so much that just like broke it out into little grids.

00:45:15.620 --> 00:45:17.270

Markert, Kel (MSFC-ST11)[UAH]

And then I was like well.

00:45:18.100 --> 00:45:29.330

Markert, Kel (MSFC-ST11)[UAH]

That this is the problem and then so we implemented this and it was able to run over all of Cambodia without breaking into grids. So it ran much more efficiently.

00:45:31.530 --> 00:45:36.380

Markert, Kel (MSFC-ST11)[UAH]

Uh it may we'll see what happens, but this actually most of the.

00:45:37.850 --> 00:46:01.960

Markert, Kel (MSFC-ST11)[UAH]

Speedup and efficiency you see is actually running and exports right. I've been kind of showing Hydra floods in interactive mode. You know just trying to like show results but really I mean, the idea is to get data out and into the hands of stakeholders and users kind of thing and so that's where the pipe function really helps to speeds up exports.

00:46:05.520 --> 00:46:08.270

Markert, Kel (MSFC-ST11)[UAH]

Any questions while this kind of runs.

00:46:15.020 --> 00:46:17.760

Markert, Kel (MSFC-ST11)[UAH]

Are there any questions in the chat I might missing anything?

00:46:18.770 --> 00:46:19.080

Markert, Kel (MSFC-ST11)[UAH]

Yeah.

00:46:22.700 --> 00:46:24.620

Markert, Kel (MSFC-ST11)[UAH]

OK, well.

00:46:27.020 --> 00:46:27.920

Markert, Kel (MSFC-ST11)[UAH]

Hopefully this runs.

00:46:30.000 --> 00:46:32.160

Markert, Kel (MSFC-ST11)[UAH]

This may be a case where we get a computation time out.

00:46:37.230 --> 00:46:40.560

Markert, Kel (MSFC-ST11)[UAH]

Plan to take a sip of water oh oh man it ran.

00:46:40.790 --> 00:46:41.710

Markert, Kel (MSFC-ST11)[UAH]

Thank you.

00:46:47.470 --> 00:46:59.560

Markert, Kel (MSFC-ST11)[UAH]

So anyway, so you can see in the in in these cases right so for example, like up here trying to run 2 years worth of data and it just failed and then.

00:47:00.180 --> 00:47:08.080

Markert, Kel (MSFC-ST11)[UAH]

We can relax, you know our scale of computation whether that's time space or a mixture of both.

00:47:09.550 --> 00:47:12.470

Markert, Kel (MSFC-ST11)[UAH]

And then if you just wanna.

00:47:14.900 --> 00:47:18.710

Markert, Kel (MSFC-ST11)[UAH]

Run everything pretty efficiently you can use this pipe function.

00:47:27.470 --> 00:47:32.320

Markert, Kel (MSFC-ST11)[UAH]

OK, any questions on on that and trying to scale.

00:47:33.280 --> 00:47:33.990

Markert, Kel (MSFC-ST11)[UAH]

Uhm.

00:47:35.750 --> 00:47:42.860

Markert, Kel (MSFC-ST11)[UAH]

The next thing I had was like setting just going through an example and setting up to run on a server.

00:47:48.210 --> 00:47:50.700

Markert, Kel (MSFC-ST11)[UAH]

All the methods really busy.

00:47:54.200 --> 00:47:56.640

Markert, Kel (MSFC-ST11)[UAH]

What are the methods first mapping surface water?

00:47:57.410 --> 00:47:59.620

Markert, Kel (MSFC-ST11)[UAH]

But when you're doing big data set.

00:48:01.790 --> 00:48:15.800

Markert, Kel (MSFC-ST11)[UAH]

Like the the scale and the clipping handling yeah, so when I first thing I do is you know just use the pipe and then you know, I know that.

00:48:16.950 --> 00:48:38.370

Markert, Kel (MSFC-ST11)[UAH]

This is just based on my personal experience and you know, some people do have problems with not problems. But like hesitations with this. But I know like running things out like 120 or 150 meter resolution doing like the scale computations at that. That doesn't necessarily like have a that Big Ben effect on the results.

00:48:39.160 --> 00:48:42.640

Markert, Kel (MSFC-ST11)[UAH]

So you gained speed up with very minimal loss in accuracies.

00:48:43.730 --> 00:48:44.470

Markert, Kel (MSFC-ST11)[UAH]

So.

00:48:45.220 --> 00:48:54.170

Markert, Kel (MSFC-ST11)[UAH]

Uhm I typically just set a scale. I use I think the default scales 90 and then I either set it at 1:20 or 150.



00:48:55.210 --> 00:48:55.850

Markert, Kel (MSFC-ST11)[UAH]

Uhm.

00:48:56.980 --> 00:49:04.070

Markert, Kel (MSFC-ST11)[UAH]

Because really what the scale is doing is sampling that histogram and you just kind of want a good idea of things.

00:49:04.920 --> 00:49:05.570

Markert, Kel (MSFC-ST11)[UAH]

Uhm.

00:49:07.400 --> 00:49:14.660

Markert, Kel (MSFC-ST11)[UAH]

And then last resort. I either like and then if and then if it becomes too big event.

00:49:15.520 --> 00:49:39.180

Markert, Kel (MSFC-ST11)[UAH]

Process I'll usually only like try and export things at a day I mean for like practically for flood mapping right if you're if you're having a situation where you're wanting to operationally produce flood Maps in the case of event, you really only going to get date information. So you can just kind of like set it up and and run just like a day.

00:49:39.870 --> 00:49:41.140

Markert, Kel (MSFC-ST11)[UAH]

The other thing.

00:49:43.460 --> 00:49:43.910

Markert, Kel (MSFC-ST11)[UAH]

Yeah.

00:49:45.290 --> 00:49:47.620

Markert, Kel (MSFC-ST11)[UAH]

I don't I try not to do the.

00:49:48.460 --> 00:49:57.730

Markert, Kel (MSFC-ST11)[UAH]

Restrict this space, too much, though I mean, this is a I mean, really this is an extreme case. I mean come on, it's like running for all of Central America.

00:49:59.010 --> 00:50:04.140

Markert, Kel (MSFC-ST11)[UAH]

You were not seeing the results. It's just slow to load but the fact that it.

00:50:04.850 --> 00:50:06.200

Markert, Kel (MSFC-ST11)[UAH]

Came back and gave a

00:50:07.580 --> 00:50:17.890

Markert, Kel (MSFC-ST11)[UAH]

family blocks area. Yeah, it came. It came back and said yes. I am getting a result from Earth engine that kind of means that it works.

00:50:20.370 --> 00:50:21.030

Markert, Kel (MSFC-ST11)[UAH]

Uhm.

00:50:22.430 --> 00:50:22.960

Markert, Kel (MSFC-ST11)[UAH]

OK.

00:50:23.960 --> 00:50:27.950

Markert, Kel (MSFC-ST11)[UAH]

See you have hydro fluids for his severe make on pulled up that you want to show that.

00:50:29.740 --> 00:50:38.890

Markert, Kel (MSFC-ST11)[UAH]

List I just thought it might be interesting there's some flooding going on outside of bankruptcy depends see just how it captures it? Yeah.

00:50:40.040 --> 00:50:40.730

Markert, Kel (MSFC-ST11)[UAH]

What is that?

00:50:41.490 --> 00:50:43.190

Markert, Kel (MSFC-ST11)[UAH]

That's a server right.

00:50:46.810 --> 00:50:52.650

Markert, Kel (MSFC-ST11)[UAH]

OK, so I'm just displaying this here this is the.

00:50:54.780 --> 00:51:15.340

Markert, Kel (MSFC-ST11)[UAH]

This is the web interface that severe Mekong has developed for hydro floods actually this all this source code is completely open. So you know anyone who wants to you know set up and and run and and have a have a viewer can can pull this code think you'll probably might want to change the institutional stuff but.

00:51:16.290 --> 00:51:16.900

Markert, Kel (MSFC-ST11)[UAH]

Uhm.

00:51:18.200 --> 00:51:20.540

Markert, Kel (MSFC-ST11)[UAH]

So if you go to launch tool.

00:51:21.850 --> 00:51:23.840

Markert, Kel (MSFC-ST11)[UAH]

Uh it'll pull up the map viewer.

00:51:31.580 --> 00:51:32.930

Markert, Kel (MSFC-ST11)[UAH]

And so in this case.

00:51:34.590 --> 00:51:37.960

Markert, Kel (MSFC-ST11)[UAH]

Severe Mekong has Hydra floods running.

00:51:41.700 --> 00:51:42.620

Markert, Kel (MSFC-ST11)[UAH]

Operationally.

00:51:42.670 --> 00:51:48.730

Markert, Kel (MSFC-ST11)[UAH]

Right and is exporting data and so actually.

00:51:49.910 --> 00:51:50.330

Markert, Kel (MSFC-ST11)[UAH]

Come on.

00:51:54.380 --> 00:52:05.020

Markert, Kel (MSFC-ST11)[UAH]

So how often does this run does it run on demand or does it run once a day. It's it's set up the run once a day so we can actually get results from today.

00:52:05.630 --> 00:52:06.420

Markert, Kel (MSFC-ST11)[UAH]

What were they?

00:52:07.340 --> 00:52:11.320

Markert, Kel (MSFC-ST11)[UAH]

What would be the benefit of running it more often than once a day?

00:52:11.370 --> 00:52:11.590

Markert, Kel (MSFC-ST11)[UAH]

Right.

00:52:14.620 --> 00:52:26.050

Markert, Kel (MSFC-ST11)[UAH]

I mean, I know that the satellite isn't passing over there like every 15 minutes or something right so what's the kind of temporal resolution into running this that.

00:52:27.560 --> 00:52:29.570

Markert, Kel (MSFC-ST11)[UAH]

That is.

00:52:31.170 --> 00:52:33.920

Markert, Kel (MSFC-ST11)[UAH]

Justified right UM.

00:52:35.000 --> 00:52:36.000

Markert, Kel (MSFC-ST11)[UAH]

I would say once a day.

00:52:37.120 --> 00:52:41.930

Markert, Kel (MSFC-ST11)[UAH]

Really for like so in this case. I think they only have sent him a one are they do you know what they are?

00:52:43.030 --> 00:52:44.070

Markert, Kel (MSFC-ST11)[UAH]

Most sensible one.

00:52:44.280 --> 00:52:49.690

Markert, Kel (MSFC-ST11)[UAH]

OK, OK, yeah, so they're they're just producing Sentinel, one flood Maps at this point.

00:52:50.100 --> 00:52:55.980

Markert, Kel (MSFC-ST11)[UAH]

Uh so for example, in like Central America and actually Amazonia there's goes coverage.

00:52:56.640 --> 00:52:58.060

Markert, Kel (MSFC-ST11)[UAH]

Right that's 15 minute.

00:52:59.680 --> 00:53:01.680

Markert, Kel (MSFC-ST11)[UAH]

Full disk for the.

00:53:03.000 --> 00:53:07.900

Markert, Kel (MSFC-ST11)[UAH]

Yeah, Western Hemisphere and so in that case you can try running it like once an hour.

00:53:08.670 --> 00:53:10.500

Markert, Kel (MSFC-ST11)[UAH]

You may not get it different?

00:53:11.600 --> 00:53:15.210

Markert, Kel (MSFC-ST11)[UAH]

There may not be updated information for Hydra floods once an hour.

00:53:16.590 --> 00:53:19.590

Markert, Kel (MSFC-ST11)[UAH]

The goes is updating every 15 minutes.

00:53:19.690 --> 00:53:21.130

Markert, Kel (MSFC-ST11)[UAH]

Yeah, but where

00:53:21.180 --> 00:53:24.970

Markert, Kel (MSFC-ST11)[UAH]

where this information is useful not necessary.

00:53:27.120 --> 00:53:28.450

Markert, Kel (MSFC-ST11)[UAH]

Yeah, UM.

00:53:29.960 --> 00:53:39.540

Markert, Kel (MSFC-ST11)[UAH]

In in this case. This example here is daily right. But I'm saying like if you want to actually run Hydra floods using goes.

00:53:40.220 --> 00:53:44.210

Markert, Kel (MSFC-ST11)[UAH]

Every hour you can go.

00:53:45.880 --> 00:53:48.050

Markert, Kel (MSFC-ST11)[UAH]

What does that mean to use goes?

00:53:48.780 --> 00:53:49.770

Markert, Kel (MSFC-ST11)[UAH]

Goes is

00:53:49.840 --> 00:53:56.190

Markert, Kel (MSFC-ST11)[UAH]

I thought those was a way to upload information and make it available rained down for everybody.

00:53:57.800 --> 00:54:06.290

Markert, Kel (MSFC-ST11)[UAH]

But maybe I don't know where it goes is so Noah has you know they're due stationary satellite so it's just you know.

00:54:07.320 --> 00:54:17.670

Markert, Kel (MSFC-ST11)[UAH]

Sitting way out, so as the earth rotates it's rotating with it kind of thing and so it's basically capturing the images at the same spot every time and so it's capturing.

00:54:18.950 --> 00:54:48.500

Markert, Kel (MSFC-ST11)[UAH]

It's pretty coarse resolution. I think what is it like one kilometer 4 kilometre? Which is so that's one of the pieces used in uh? Yes, so you well only backup. It currently is not implemented but theoretically it can be and what I'm saying is like you know if there's interest in and having that you. You can't have something like that, so I think so.

Really what I should say is the the timing of your.

00:54:48.560 --> 00:54:53.140

Markert, Kel (MSFC-ST11)[UAH]

Exports that you're setting up should be relative to the temporal.

00:54:54.070 --> 00:54:56.360

Markert, Kel (MSFC-ST11)[UAH]

Uh acquisitions of your satellites.

00:54:57.670 --> 00:55:09.560

Markert, Kel (MSFC-ST11)[UAH]

So, in this case, Sentinel, one probably only gives you a good image over Thailand. Maybe once a day. Maybe every other day kind of thing, so you just run it at that time period.

00:55:10.580 --> 00:55:10.980

Markert, Kel (MSFC-ST11)[UAH]

So.

00:55:12.240 --> 00:55:15.250

Markert, Kel (MSFC-ST11)[UAH]

Sorry. If that was a very long winded convoluted answer.

00:55:21.100 --> 00:55:30.980

Markert, Kel (MSFC-ST11)[UAH]

Under secure some playing around with it now, just to see I don't know if they do any kind of like different thing or kind of like extract fluids from here, but

00:55:32.210 --> 00:55:33.000

Markert, Kel (MSFC-ST11)[UAH]

I know you can.

00:55:35.680 --> 00:55:40.970

Markert, Kel (MSFC-ST11)[UAH]

I'm sorry this is in the way but if you set permanent to like.

00:55:42.510 --> 00:55:43.400

Markert, Kel (MSFC-ST11)[UAH]

Dark blue.

00:55:47.760 --> 00:55:51.050

Markert, Kel (MSFC-ST11)[UAH]

You can kind of see where it should be water.

00:55:56.630 --> 00:56:04.960

Markert, Kel (MSFC-ST11)[UAH]

Normally so you kind of think of this as like, what we just did right and this permanent water is being pulled from the JRC data set.

00:56:06.620 --> 00:56:07.110

Markert, Kel (MSFC-ST11)[UAH]

So.

00:56:09.510 --> 00:56:19.600

Markert, Kel (MSFC-ST11)[UAH]

So this is a case where Hydra Flex is run in a set up and run and I have an example of where we can.

00:56:20.570 --> 00:56:21.560

Markert, Kel (MSFC-ST11)[UAH]

Set it up and run.

00:56:24.530 --> 00:56:28.620

Markert, Kel (MSFC-ST11)[UAH]

Correct they answer your questions doctor, Nelson Yeah, so I mean, I guess.

00:56:29.750 --> 00:56:39.400

Markert, Kel (MSFC-ST11)[UAH]

It's probably shows my ignorance of not being here. The last couple of days so I might be asking a question that everybody already knows yeah, no that's a good question.

00:56:40.500 --> 00:56:42.500

Markert, Kel (MSFC-ST11)[UAH]

How many different satellite?

00:56:43.370 --> 00:56:44.120

Markert, Kel (MSFC-ST11)[UAH]

Uh.

00:56:44.810 --> 00:56:59.070

Markert, Kel (MSFC-ST11)[UAH]

Resources are used, or can be used in the hybrid cloud process. Yeah, that's a That's a really good question. So I'm going to refer to the documentation here, so as of right now.

00:56:59.280 --> 00:57:02.630

Markert, Kel (MSFC-ST11)[UAH]

Uh in the documentation, we have.

00:57:04.020 --> 00:57:05.010

Markert, Kel (MSFC-ST11)[UAH]

These.

00:57:06.350 --> 00:57:23.780

Markert, Kel (MSFC-ST11)[UAH]

66. It's actually 7 'cause I added Landsat, 5 in and haven't updated documentation. We have these 7 datasets implemented and what I mean by datasets is it does, that automatic QA processing it does all the you know.

00:57:23.830 --> 00:57:27.410

Markert, Kel (MSFC-ST11)[UAH]

Wow, like pre processing for you right.

00:57:28.040 --> 00:57:33.290

Markert, Kel (MSFC-ST11)[UAH]

Uh because each one is preprocessed little bit, yes, exactly so that's

00:57:33.360 --> 00:57:33.920

Markert, Kel (MSFC-ST11)[UAH]

to get another.

00:57:34.970 --> 00:57:46.090

Markert, Kel (MSFC-ST11)[UAH]

Resources are assets, but then you'd have to yeah, yeah, exactly and so back to my question, then which one does go speed.

00:57:48.150 --> 00:57:53.820

Markert, Kel (MSFC-ST11)[UAH]

Goes is its own sensor so this is actually OK, so those would be a different.

00:57:55.200 --> 00:58:11.700

Markert, Kel (MSFC-ST11)[UAH]

So you'd have to do some pre prod and that's why you said theoretically if you just goes you'd have to set up that preprocessing yeah, and then for it. It would be 15 minutes. But yeah, so I kind of already did something like that, so in Hydra floods, so you can kind of create your own.

00:58:12.160 --> 00:58:14.240

Markert, Kel (MSFC-ST11)[UAH]

Uh data class.

00:58:15.410 --> 00:58:45.370

Markert, Kel (MSFC-ST11)[UAH]

And so basically all you need to do is provide it. Some asset ID on Earth engine and it will go and grab those data and have all that preprocessing set up the the kicker here is you know if you want to. You don't have to. But in this case you have to define like a QA process and that that is what's you know kicked off automatically for our say like Landsat Modis and all those right and so in this case for goes.

00:58:46.590 --> 00:59:10.780

Markert, Kel (MSFC-ST11)[UAH]

What we're doing is they they provide it? It's scaled numbers and so we're just pulling this QA QA processes, pointing in the scaling factors and re scaling it to to reflect its values and you can get an image like this. But the only reason why it goes has the ghost sensor hasn't been implemented in Hydra floods yet is because.

00:59:12.380 --> 00:59:14.910

Markert, Kel (MSFC-ST11)[UAH]

As you can see clouds are a problem.

00:59:15.780 --> 00:59:38.770

Markert, Kel (MSFC-ST11)[UAH]

Uh especially if you're acquiring data at 15:00 days or 15 minute intervals. And so there isn't a very robust cloud masking method readily available, so that's an Avenue for research and could actually be a really interesting project of doing an operational flood mapping for goes and I'd floods.

00:59:42.840 --> 00:59:51.830

Markert, Kel (MSFC-ST11)[UAH]

So uhm end would actually probably provide some really cool information for the Americas. I know Noah has their their algorithm but.

00:59:53.940 --> 00:59:59.590

Markert, Kel (MSFC-ST11)[UAH]

Honestly, it's like just it's just a decision tree kind of thing and so I'm not too sold on it.

01:00:03.190 --> 01:00:03.790

Markert, Kel (MSFC-ST11)[UAH]

Cool.

01:00:05.320 --> 01:00:05.740

Markert, Kel (MSFC-ST11)[UAH]

OK.

01:00:06.750 --> 01:00:11.550

Markert, Kel (MSFC-ST11)[UAH]

So going back to this hydro viewer so one may ask how does this.

01:00:11.700 --> 01:00:19.870

Markert, Kel (MSFC-ST11)[UAH]

Uhm how does one just set up and run it every day? Do you have to go into your notebooks and change the change in value and?

01:00:20.840 --> 01:00:25.450

Markert, Kel (MSFC-ST11)[UAH]

You know blah blah blah blah and then run through the whole notebook again. The answer is no you don't have to do that.

01:00:26.910 --> 01:00:29.830

Markert, Kel (MSFC-ST11)[UAH]

So maybe I can share my entire screen.

01:00:33.470 --> 01:00:35.520

Markert, Kel (MSFC-ST11)[UAH]

Share the whole screen OK.

01:00:37.710 --> 01:00:39.130

Markert, Kel (MSFC-ST11)[UAH]

So can everybody see my.

01:00:40.150 --> 01:00:42.380

Markert, Kel (MSFC-ST11)[UAH]

Uh it should be a?

01:00:43.470 --> 01:00:46.470

Markert, Kel (MSFC-ST11)[UAH]

Script looking thing with a bunch of code.

01:00:49.820 --> 01:00:55.360

Markert, Kel (MSFC-ST11)[UAH]

I'll OK I'm assume everybody is nodding their head yes.

01:00:57.440 --> 01:01:04.180

Markert, Kel (MSFC-ST11)[UAH]

OK, So what you do is you would want to set up a Python script.

01:01:05.330 --> 01:01:19.820

Markert, Kel (MSFC-ST11)[UAH]

And and set it up in a way to where we can basically you're just defining this process that that we have and these notebooks right and Interestingly enough you can actually if you're if you want to you can actually.

01:01:20.570 --> 01:01:21.730

Markert, Kel (MSFC-ST11)[UAH]

Uh.

01:01:24.520 --> 01:01:28.010

Markert, Kel (MSFC-ST11)[UAH]

Can you download yeah download download as a Python script?

01:01:29.600 --> 01:01:33.400

Markert, Kel (MSFC-ST11)[UAH]

You'll have to probably remove all of this stuff.

01:01:34.610 --> 01:01:40.600

Markert, Kel (MSFC-ST11)[UAH]

For like the mapping, but you know you can have the whole process available.

01:01:42.010 --> 01:01:52.920

Markert, Kel (MSFC-ST11)[UAH]

So this is the script that we have setup that we had set up for processing. Hydra floods during hurricane at an iota you see Hydra floods iota exports.

01:01:54.750 --> 01:02:04.120

Markert, Kel (MSFC-ST11)[UAH]

So what we're doing here is we're grabbing the region of interest for the 5 countries. We actually remember how I said, we

01:02:06.220 --> 01:02:14.550

Markert, Kel (MSFC-ST11)[UAH]

titled or you can tile things and run for small regions. That's actually what we're doing here, we actually did that so that way.

01:02:16.140 --> 01:02:29.260

Markert, Kel (MSFC-ST11)[UAH]

Because of bandwidth issues and Central America, so that way. They can just get the area that they wanted and and download that versus having to try and download an entire massive area right.

01:02:30.810 --> 01:02:50.180

Markert, Kel (MSFC-ST11)[UAH]

So you're basically and again Hydra floods has a function to tile a region say just give it a geometry and it will say what's the resolution that you want to export. The UM and this is in decimal degrees. So this is one by one decimal degree grid, which is pretty it's not massive but.

01:02:50.250 --> 01:02:52.620

Markert, Kel (MSFC-ST11)[UAH]

Come you know it's a good sized area.

01:02:53.810 --> 01:02:57.990

Markert, Kel (MSFC-ST11)[UAH]

As you can see here we have the elevation, we're pulling in permanent water.

01:02:58.720 --> 01:03:03.270

Markert, Kel (MSFC-ST11)[UAH]

And then we just wrote a very you know straightforward function to do this.

01:03:05.430 --> 01:03:18.960

Markert, Kel (MSFC-ST11)[UAH]

Uh to do the exports and so in this case you provide it a start time and end time and then there's this region that region would have been a that one of the tiles right.

01:03:20.330 --> 01:03:39.360

Markert, Kel (MSFC-ST11)[UAH]

And so uh MU check if this our data has this is where you want to check and make sure make your make your workflows robust right so in this case this in images is very helpful 'cause. You don't want to try and process something that doesn't have any imagery for that day right so you can check that has imagery.

01:03:40.340 --> 01:03:52.790

Markert, Kel (MSFC-ST11)[UAH]

And if it had imagery then you would go through and do a come through this process right so you see how slow correction were doing you know that hand masking applying a spectral filtering.

01:03:53.660 --> 01:03:56.530

Markert, Kel (MSFC-ST11)[UAH]

Uh and then, instead of applying the.

01:03:57.440 --> 01:04:06.290

Markert, Kel (MSFC-ST11)[UAH]

Uhm the Otsu thresholding on each individual image what we did is for each day is mosaic come together and then apply the threshold.

01:04:07.660 --> 01:04:10.670

Markert, Kel (MSFC-ST11)[UAH]

It just seemed to work, a little bit better in the case.

01:04:11.670 --> 01:04:13.850

Markert, Kel (MSFC-ST11)[UAH]

And so at that case.

01:04:14.860 --> 01:04:17.190

Markert, Kel (MSFC-ST11)[UAH]

You know this is a lot of just.

01:04:18.650 --> 01:04:33.190

Markert, Kel (MSFC-ST11)[UAH]

So this is pulling out time information. This is getting the coordinates for that tile that we were processing and then we were basically tagging each image and saying like here's the date. Here's here's the X&Y coordinate of the tile.

01:04:35.670 --> 01:04:37.720

Markert, Kel (MSFC-ST11)[UAH]

And then we ran the process right.



01:04:38.690 --> 01:04:44.130

Markert, Kel (MSFC-ST11)[UAH]

So this, this that's the function to run right so it actually hasn't done anything and within the script.

01:04:45.310 --> 01:04:59.810

Markert, Kel (MSFC-ST11)[UAH]

So if if we ran this everyday right we would need to say at some point where to get the date information and Python has a very easy way to do it and so you just get you know this datetime object.

01:05:01.050 --> 01:05:02.670

Markert, Kel (MSFC-ST11)[UAH]

And then you want to do your.

01:05:05.620 --> 01:05:10.410

Markert, Kel (MSFC-ST11)[UAH]

Date time for I think what we're doing is we're processing like.

01:05:11.060 --> 01:05:12.330

Markert, Kel (MSFC-ST11)[UAH]

2 days later.

01:05:13.170 --> 01:05:17.070

Markert, Kel (MSFC-ST11)[UAH]

So so you know central one would acquire.

01:05:17.920 --> 01:05:21.730

Markert, Kel (MSFC-ST11)[UAH]

On Wednesday and then we process the the the data today.

01:05:22.710 --> 01:05:23.540

Markert, Kel (MSFC-ST11)[UAH]

From Wednesday.

01:05:24.270 --> 01:05:31.520

Markert, Kel (MSFC-ST11)[UAH]

And so this is just doing some data manipulation and then we just loop through all the tiles and then ran the exports right.

01:05:32.860 --> 01:05:33.260

Markert, Kel (MSFC-ST11)[UAH]

So.

01:05:34.110 --> 01:05:38.380

Markert, Kel (MSFC-ST11)[UAH]

This is just defining how how to do everything like we haven't run anything yet.

01:05:39.300 --> 01:05:41.430

Markert, Kel (MSFC-ST11)[UAH]

So uhm theoretically.

01:05:42.160 --> 01:05:43.560

Markert, Kel (MSFC-ST11)[UAH]

Uh let me.

01:05:43.610 --> 01:05:46.320

Markert, Kel (MSFC-ST11)[UAH]

See I go here.

01:05:47.810 --> 01:05:48.800

Markert, Kel (MSFC-ST11)[UAH]

I don't like that.

01:05:50.710 --> 01:05:56.120

Markert, Kel (MSFC-ST11)[UAH]

Where did I say this this is in my downloads so if I do conda activate?

01:05:58.830 --> 01:05:59.750

Markert, Kel (MSFC-ST11)[UAH]

My.

01:06:00.890 --> 01:06:03.240  
Markert, Kel (MSFC-ST11)[UAH]  
Hydra floods environment that is not right.  
01:06:05.580 --> 01:06:09.450  
Markert, Kel (MSFC-ST11)[UAH]  
And then I go to my downloads.  
01:06:13.180 --> 01:06:16.470  
Markert, Kel (MSFC-ST11)[UAH]  
And I did Python HF.  
01:06:17.940 --> 01:06:19.570  
Markert, Kel (MSFC-ST11)[UAH]  
Underscore Iota exports.  
01:06:22.100 --> 01:06:22.970  
Markert, Kel (MSFC-ST11)[UAH]  
As overruns.  
01:06:23.790 --> 01:06:24.200  
Markert, Kel (MSFC-ST11)[UAH]  
Oop.  
01:06:26.390 --> 01:06:30.110  
Markert, Kel (MSFC-ST11)[UAH]  
Please specify a non zero ah, it was a little bit of A.  
01:06:30.170 --> 01:06:30.470  
Markert, Kel (MSFC-ST11)[UAH]  
Yep.  
01:06:34.000 --> 01:06:38.740  
Markert, Kel (MSFC-ST11)[UAH]  
I think that was there.  
01:06:45.370 --> 01:06:47.730  
Markert, Kel (MSFC-ST11)[UAH]  
Intersection oh sorry this is here.  
01:06:50.500 --> 01:06:55.950  
Markert, Kel (MSFC-ST11)[UAH]  
Sorry. This is running literally last year around this time and.  
01:06:57.570 --> 01:07:01.790  
Markert, Kel (MSFC-ST11)[UAH]  
Earth engine has updated their API since then, so.  
01:07:01.840 --> 01:07:02.190  
Markert, Kel (MSFC-ST11)[UAH]  
Cool.  
01:07:03.330 --> 01:07:03.860  
Markert, Kel (MSFC-ST11)[UAH]  
Uh.  
01:07:10.890 --> 01:07:20.350  
Markert, Kel (MSFC-ST11)[UAH]  
OK, cool, so now you see here it's outputting something so this is saying. This is the date that we're processing right  
so this was Wednesday.  
01:07:21.870 --> 01:07:22.530  
Markert, Kel (MSFC-ST11)[UAH]  
Uhm.  
01:07:25.120 --> 01:07:26.790  
Markert, Kel (MSFC-ST11)[UAH]  
Maybe I can make this a little bigger so.

01:07:30.380 --> 01:07:34.250

Markert, Kel (MSFC-ST11)[UAH]

And I think if I.

01:07:34.310 --> 01:07:35.050

Markert, Kel (MSFC-ST11)[UAH]

Yeah.

01:07:49.650 --> 01:07:50.640

Markert, Kel (MSFC-ST11)[UAH]

Now it should be running.

01:07:55.050 --> 01:07:58.800

Markert, Kel (MSFC-ST11)[UAH]

Well let that cook a bit, but anyway, the idea is that you.

01:07:59.600 --> 01:08:15.550

Markert, Kel (MSFC-ST11)[UAH]

There we go now, it's exporting something so the idea is that it will set up the exports and then in this case, it had the tile information right so this is the top left at the tile. It's 88 degrees West and 13 degrees North and the date.

01:08:16.530 --> 01:08:19.960

Markert, Kel (MSFC-ST11)[UAH]

And so you can kind of keep track of all that and you see that it's running now.

01:08:21.460 --> 01:08:31.670

Markert, Kel (MSFC-ST11)[UAH]

So that's one way to do it, so you set up your script and you run it and I'll actually upload. This script to the Google drive so you can all have an example? How to of how that works.

01:08:33.690 --> 01:08:44.600

Markert, Kel (MSFC-ST11)[UAH]

But sometimes you just don't want to run something every day and the way to do. That is to set up a Cron Job Is everybody know what a Cron job is.

01:08:45.980 --> 01:08:48.360

Markert, Kel (MSFC-ST11)[UAH]

Every user but yeah, OK.

01:08:48.410 --> 01:08:48.700

Markert, Kel (MSFC-ST11)[UAH]

Yeah.

01:08:49.150 --> 01:08:50.320

Markert, Kel (MSFC-ST11)[UAH]

But it is a man.

01:08:52.830 --> 01:08:55.740

Markert, Kel (MSFC-ST11)[UAH]

I don't know exactly what it is either but I know the concept of it.

01:08:56.910 --> 01:09:10.820

Markert, Kel (MSFC-ST11)[UAH]

And I know how to set one up so basically a Cron job is, is something that says like at every you can specify your time interval and you say run this process right so you can set it up to say everyday run this process?

01:09:11.660 --> 01:09:28.050

Markert, Kel (MSFC-ST11)[UAH]

Right and that's actually what we did with Hydra floods in the case of Hurricane. Edit an iota and this is what we have running on severe Mekong. So where they're exporting those data every day as you saw like we literally had data already available today so.

01:09:29.500 --> 01:09:36.180

Markert, Kel (MSFC-ST11)[UAH]

Is of Linux utility that schedules a command or script on your server to run automatically at a specified time and date.

01:09:37.230 --> 01:09:37.730

Markert, Kel (MSFC-ST11)[UAH]

Thank you.

01:09:40.340 --> 01:09:41.170

Markert, Kel (MSFC-ST11)[UAH]

I was half right.

01:09:41.220 --> 01:09:41.390

Markert, Kel (MSFC-ST11)[UAH]

Yeah.

01:09:43.010 --> 01:09:47.690

Markert, Kel (MSFC-ST11)[UAH]

70% Cron jobs can be very useful to automate repetitive tasks.

01:09:49.480 --> 01:10:07.320

Markert, Kel (MSFC-ST11)[UAH]

Yep, yeah, and I like to say programmers are smart, lazy people and they don't like to do. Repetitive tasks and I sometimes feel like I'm not lazy, but I sometimes feel lazy and I try to Automate as much as possible so we're going to actually go through and.

01:10:07.580 --> 01:10:11.280

Markert, Kel (MSFC-ST11)[UAH]

Uhm show kind of how to set up a Cron job.

01:10:12.370 --> 01:10:17.130

Markert, Kel (MSFC-ST11)[UAH]

Uh because I did I when I did this, I had to do a lot of Googling.

01:10:18.360 --> 01:10:23.810

Markert, Kel (MSFC-ST11)[UAH]

So I'm going to log into our server that I had running this.

01:10:27.690 --> 01:10:29.840

Markert, Kel (MSFC-ST11)[UAH]

OK so now I'm in my server.

01:10:31.970 --> 01:10:33.540

Markert, Kel (MSFC-ST11)[UAH]

I don't know why it's called Popper.

01:10:34.640 --> 01:10:35.350

Markert, Kel (MSFC-ST11)[UAH]

There's some.

01:10:36.830 --> 01:10:38.260

Markert, Kel (MSFC-ST11)[UAH]

It was some.

01:10:40.090 --> 01:10:44.290

Markert, Kel (MSFC-ST11)[UAH]

All over servers are named after some philosopher I forgot who Popper was.

01:10:45.460 --> 01:10:51.590

Markert, Kel (MSFC-ST11)[UAH]

Socrates Improper Yep OK so if I look into my.

01:10:52.650 --> 01:11:07.430

Markert, Kel (MSFC-ST11)[UAH]

What's going on here and I have a directory called Hydra runs and if I go into that directory and look? What's going on, I have this HF at AR sorry Hydra floods iota exports.

01:11:08.180 --> 01:11:13.570

Markert, Kel (MSFC-ST11)[UAH]

Uh and if I remember I actually need to update that.

01:11:15.160 --> 01:11:16.140

Markert, Kel (MSFC-ST11)[UAH]

Intercession.

01:11:22.090 --> 01:11:23.010

Markert, Kel (MSFC-ST11)[UAH]

Popper was

01:11:25.040 --> 01:11:30.680

Markert, Kel (MSFC-ST11)[UAH]

known for his rejection of the classical scientific method in favor of empirical falsification.

01:11:31.850 --> 01:11:32.180

Markert, Kel (MSFC-ST11)[UAH]

Huh.

01:11:34.810 --> 01:11:35.490

Markert, Kel (MSFC-ST11)[UAH]

Interesting.

01:11:37.310 --> 01:11:41.710

Markert, Kel (MSFC-ST11)[UAH]

OK, so then we have that, so I'm just going to do.

01:11:43.000 --> 01:11:47.670

Markert, Kel (MSFC-ST11)[UAH]

I'm just going to see if it runs real quick just to make sure well I need to.

01:11:53.570 --> 01:11:58.720

Markert, Kel (MSFC-ST11)[UAH]

So with Python, you have also had to be very careful with your environments.

01:11:59.690 --> 01:12:02.480

Markert, Kel (MSFC-ST11)[UAH]

So just a word of caution here.

01:12:04.060 --> 01:12:14.110

Markert, Kel (MSFC-ST11)[UAH]

So uhm I named it the same thing I draft so I'm going to activate my Python environment and I'm going to try and run that and I'm just going to see if it actually.

01:12:15.710 --> 01:12:19.700

Markert, Kel (MSFC-ST11)[UAH]

I'm not gonna run in the exports. I'm gonna cancel it bad requests.

01:12:22.320 --> 01:12:24.950

Markert, Kel (MSFC-ST11)[UAH]

I'm gonna have to authenticate because probably.

01:12:27.080 --> 01:12:40.050

Markert, Kel (MSFC-ST11)[UAH]

So, in this case, I had a bad bad requests from Google and basically what that means is my authentications have expired so I'm just going to need to authenticate again.

01:12:42.250 --> 01:12:56.180

Markert, Kel (MSFC-ST11)[UAH]

So I will go through this whole authentication process again. It's the same thing. We just have been doing where you just specify which account you want to use you get this authentication code and paste it in here.

01:12:57.050 --> 01:13:01.500

Markert, Kel (MSFC-ST11)[UAH]

OK, so now it's saved my authentication code and I will run it.

01:13:07.050 --> 01:13:12.540

Markert, Kel (MSFC-ST11)[UAH]

And hopefully it'll give the dates OK, there, we go cool. So I'm just going to count I just cancelled it.

01:13:13.540 --> 01:13:16.940

Markert, Kel (MSFC-ST11)[UAH]

Just because I don't want it to export 'cause it's already.

01:13:18.290 --> 01:13:19.350

Markert, Kel (MSFC-ST11)[UAH]

Running export here.

01:13:20.480 --> 01:13:21.070

Markert, Kel (MSFC-ST11)[UAH]

Uhm.

01:13:22.330 --> 01:13:23.960

Markert, Kel (MSFC-ST11)[UAH]

Now to set up your Cron job.

01:13:24.650 --> 01:13:31.420

Markert, Kel (MSFC-ST11)[UAH]

So I'm going to change my directories back to home. I'm going to come out of my conda environment.

01:13:32.450 --> 01:13:33.790

Markert, Kel (MSFC-ST11)[UAH]

Deactivate.

01:13:33.840 --> 01:13:34.220

Markert, Kel (MSFC-ST11)[UAH]

It's

01:13:35.230 --> 01:13:37.110

Markert, Kel (MSFC-ST11)[UAH]

and 22.

01:13:38.520 --> 01:13:43.860

Markert, Kel (MSFC-ST11)[UAH]

Edit your Cron jobs, it is a command called Crontab Dash.

01:13:47.270 --> 01:13:48.030

Markert, Kel (MSFC-ST11)[UAH]

So you run that.

01:13:48.080 --> 01:13:48.320

Markert, Kel (MSFC-ST11)[UAH]

Yeah.

01:13:49.390 --> 01:13:50.560

Markert, Kel (MSFC-ST11)[UAH]

And it will actually.

01:13:52.540 --> 01:13:57.020

Markert, Kel (MSFC-ST11)[UAH]

Put you into your default favorite text editor on your server.

01:13:58.260 --> 01:14:03.200

Markert, Kel (MSFC-ST11)[UAH]

And you'll see this is the Cron job.

01:14:04.180 --> 01:14:05.310

Markert, Kel (MSFC-ST11)[UAH]

Configuration file.

01:14:06.450 --> 01:14:11.090

Markert, Kel (MSFC-ST11)[UAH]

And it provides information on each task has to be find in a single line.

01:14:11.940 --> 01:14:26.390

Markert, Kel (MSFC-ST11)[UAH]

Uh and you had to define the fields on what the task is doing and then you also have to provide the information on when it runs right at what interval are you running it regularly and so for example, you know they have here.

01:14:27.180 --> 01:14:29.620

Markert, Kel (MSFC-ST11)[UAH]

That at every day at 5:00 AM.

01:14:30.570 --> 01:14:35.160

Markert, Kel (MSFC-ST11)[UAH]

They're gonna run a zip process on the entire home directory.

01:14:37.280 --> 01:14:44.460

Markert, Kel (MSFC-ST11)[UAH]

What we wanna do is we wanna say every day at a certain day or a certain time run the Hydra flex stuff.

01:14:46.250 --> 01:14:48.100

Markert, Kel (MSFC-ST11)[UAH]

So I

01:14:49.400 --> 01:14:50.330

Markert, Kel (MSFC-ST11)[UAH]

already have that.

01:14:52.230 --> 01:14:56.260

Markert, Kel (MSFC-ST11)[UAH]

I don't know why it says sleep there, OK, so we already have that here.

01:14:57.640 --> 01:15:02.450

Markert, Kel (MSFC-ST11)[UAH]

So I'm going to edit this and I'm just going to paste that in there so.

01:15:03.110 --> 01:15:04.750

Markert, Kel (MSFC-ST11)[UAH]

What this is saying here?

01:15:06.640 --> 01:15:07.540

Markert, Kel (MSFC-ST11)[UAH]

Is?

01:15:10.380 --> 01:15:24.130

Markert, Kel (MSFC-ST11)[UAH]

For so you specify the time right so in this case, it was running at 6:00 AM everyday right. So I have the minutes and the hour, so if I had 6 if I had 59 there it would run at 6:59.

01:15:25.070 --> 01:15:34.000

Markert, Kel (MSFC-ST11)[UAH]

Right so in this case you're you're just specifying when you run or run it up and then you can also specify over here.

01:15:35.030 --> 01:15:36.120

Markert, Kel (MSFC-ST11)[UAH]

Uh what are these?

01:15:37.420 --> 01:15:38.790

Markert, Kel (MSFC-ST11)[UAH]

Uh.

01:15:40.990 --> 01:15:47.360

Markert, Kel (MSFC-ST11)[UAH]

Day of the month month or day of the of the week, so in this case like if you have like first.

01:15:48.180 --> 01:15:58.940

Markert, Kel (MSFC-ST11)[UAH]

If you have one that means it's going to run every first of the month. If you have all of these settings asterisks. It's just gonna run daily kind of thing right so.

01:15:58.990 --> 01:15:59.230

Markert, Kel (MSFC-ST11)[UAH]

So.

01:16:00.270 --> 01:16:10.470

Markert, Kel (MSFC-ST11)[UAH]

Uh I'm actually going to set this up to run in 2 minutes. Let's see if we can do that, So what is 5 that will be?

01:16:10.520 --> 01:16:16.510

Markert, Kel (MSFC-ST11)[UAH]

He now 17, and I'm going to run at 20:05.

01:16:19.900 --> 01:16:20.660

Markert, Kel (MSFC-ST11)[UAH]

I think.

01:16:24.570 --> 01:16:29.760

Markert, Kel (MSFC-ST11)[UAH]

OK, so once I'm done with that I will save and exit. I'm actually going to check.

01:16:31.010 --> 01:16:31.580

Markert, Kel (MSFC-ST11)[UAH]

What?

01:16:33.090 --> 01:16:40.290

Markert, Kel (MSFC-ST11)[UAH]

The time is here, the time that they timed out now 'cause I think it's in UTC actually.

01:16:42.510 --> 01:16:44.280

Markert, Kel (MSFC-ST11)[UAH]

Yep, 2323.

01:16:46.810 --> 01:16:53.190

Markert, Kel (MSFC-ST11)[UAH]

So I'm going to actually edit my crontab. So it's so I'm going to run it at 23:25.

01:16:59.550 --> 01:17:05.940

Markert, Kel (MSFC-ST11)[UAH]

OK so now once I once I've saved and exited you'll see crontab installing new crontab.

01:17:08.110 --> 01:17:13.300

Markert, Kel (MSFC-ST11)[UAH]

And that's all you do so we're just going to wait around for a minute and.

01:17:14.580 --> 01:17:19.090

Markert, Kel (MSFC-ST11)[UAH]

Uh I'm actually going to cancel all of these cancel cancel 17 tasks.

01:17:21.990 --> 01:17:26.500

Markert, Kel (MSFC-ST11)[UAH]

So that way when we did that finish that finished.

01:17:28.000 --> 01:17:36.200

Markert, Kel (MSFC-ST11)[UAH]

So that way when the crontab hits or when the Cron job hits will actually see those exports right and there, we go.

It's actually running.

01:17:42.750 --> 01:17:44.310

Markert, Kel (MSFC-ST11)[UAH]

So.

01:17:47.840 --> 01:17:48.200

Markert, Kel (MSFC-ST11)[UAH]

Will be done?

01:17:48.250 --> 01:17:48.420

Markert, Kel (MSFC-ST11)[UAH]

Right.

01:17:50.000 --> 01:17:51.650

Markert, Kel (MSFC-ST11)[UAH]

I think those are the other tasks.

01:17:51.780 --> 01:17:55.070

Markert, Kel (MSFC-ST11)[UAH]

Let's just start at 20:05, yeah that was 88.

01:17:56.040 --> 01:18:06.990

Markert, Kel (MSFC-ST11)[UAH]

Black teen, OK, yeah, those are the other tasks, so I just cancelled all this so once it hits 25 and and also to there's going to be at that little bit of lag 'cause That's like go through and each tile.

01:18:10.690 --> 01:18:11.070

Markert, Kel (MSFC-ST11)[UAH]

And.



01:18:12.150 --> 01:18:12.560

Markert, Kel (MSFC-ST11)[UAH]

So.

01:18:15.230 --> 01:18:17.860

Markert, Kel (MSFC-ST11)[UAH]

Zigzagging fingers crossed we'll see if it works.

01:18:22.760 --> 01:18:25.080

Markert, Kel (MSFC-ST11)[UAH]

The danger of this is if you leave it.

01:18:26.180 --> 01:18:28.290

Markert, Kel (MSFC-ST11)[UAH]

And forget how to do all this stuff.

01:18:29.320 --> 01:18:32.160

Markert, Kel (MSFC-ST11)[UAH]

There will be a lot of exports.

01:18:33.910 --> 01:18:37.980

Markert, Kel (MSFC-ST11)[UAH]

But that just means a nice robust.

01:18:38.880 --> 01:18:39.470

Markert, Kel (MSFC-ST11)[UAH]

System.

01:18:41.400 --> 01:18:47.120

Markert, Kel (MSFC-ST11)[UAH]

Any questions, so far on kind of what we did in terms of setup and then run.

01:18:48.850 --> 01:18:49.900

Markert, Kel (MSFC-ST11)[UAH]

For the Crown job.

01:18:51.840 --> 01:18:58.900

Markert, Kel (MSFC-ST11)[UAH]

Again, this is focused more for like if there's an event going on or you want to set up prior to an event do something right.

01:19:00.310 --> 01:19:06.980

Markert, Kel (MSFC-ST11)[UAH]

This could be this could actually like if you want to export like monthly Maps on something right. This is some way to do it so.

01:19:12.240 --> 01:19:16.180

Markert, Kel (MSFC-ST11)[UAH]

Oh got it first one coming in cool so.

01:19:17.690 --> 01:19:20.110

Markert, Kel (MSFC-ST11)[UAH]

I didn't I didn't Mister Cron do his job.

01:19:20.300 --> 01:19:20.720

Markert, Kel (MSFC-ST11)[UAH]

Yes.

01:19:22.050 --> 01:19:28.650

Markert, Kel (MSFC-ST11)[UAH]

So now it's going to run everyday at 5:25.

01:19:29.810 --> 01:19:31.200

Markert, Kel (MSFC-ST11)[UAH]

Overall, Central America.

01:19:34.740 --> 01:19:35.650

Markert, Kel (MSFC-ST11)[UAH]

Any questions.

01:19:40.810 --> 01:19:42.950

Markert, Kel (MSFC-ST11)[UAH]

Do you have that on the documentation?

01:19:43.760 --> 01:19:44.190

Markert, Kel (MSFC-ST11)[UAH]

Alright.

01:19:45.870 --> 01:19:55.470

Markert, Kel (MSFC-ST11)[UAH]

You walk through setting up a Cron job, but do you have like an example. Let's should be in Cron job on the documentation that we have to remember?

01:19:56.140 --> 01:19:58.960

Markert, Kel (MSFC-ST11)[UAH]

We sit down boarding? Yeah.

01:20:00.040 --> 01:20:09.790

Markert, Kel (MSFC-ST11)[UAH]

That is true now there's a recording, but yeah, it's good good question Doctor Nelson. Yeah, the question was is there documentation on how to do this, the answer is.

01:20:10.170 --> 01:20:11.600

Markert, Kel (MSFC-ST11)[UAH]

That documentation is kind of like.

01:20:12.210 --> 01:20:16.890

Markert, Kel (MSFC-ST11)[UAH]

So you go from this Python right now run it automatically.

01:20:17.500 --> 01:20:25.650

Markert, Kel (MSFC-ST11)[UAH]

Yep, Yep so we will there's never enough documentation right right that is that's good advice. We should put that in there.

01:20:26.660 --> 01:20:27.050

Markert, Kel (MSFC-ST11)[UAH]

So.

01:20:28.240 --> 01:20:28.860

Markert, Kel (MSFC-ST11)[UAH]

Uhm.

01:20:29.720 --> 01:20:35.260

Markert, Kel (MSFC-ST11)[UAH]

Yeah, the whole idea of scripting this, maybe I can show you some other examples of scripts.

01:20:35.940 --> 01:20:36.810

Markert, Kel (MSFC-ST11)[UAH]

Uh.

01:20:37.720 --> 01:20:40.090

Markert, Kel (MSFC-ST11)[UAH]

I mean, I use Hydra fluids all the time now.

01:20:40.140 --> 01:20:40.410

Markert, Kel (MSFC-ST11)[UAH]

Right.

01:20:42.640 --> 01:20:44.590

Markert, Kel (MSFC-ST11)[UAH]

So for example, like this is.

01:20:46.280 --> 01:20:51.830

Markert, Kel (MSFC-ST11)[UAH]

A script that I have and I just list the dates right and I just loop through the dates and.

01:20:55.080 --> 01:20:58.310

Markert, Kel (MSFC-ST11)[UAH]

You see here I'm using the pipe function, it's a little.

01:20:59.320 --> 01:21:17.430

Markert, Kel (MSFC-ST11)[UAH]

Messy code I did not actually mean to show everybody this, but you know in this case. They're just looping through if I wanna run specific dates. I just loop through those dates and then I have hydroflex filter. I set up a new data set for each new date and do the process and then export.

01:21:19.060 --> 01:21:19.610

Markert, Kel (MSFC-ST11)[UAH]

So.

01:21:25.450 --> 01:21:28.380

Markert, Kel (MSFC-ST11)[UAH]

I mean, there's there's a lot of I mean, you could be very.

01:21:29.080 --> 01:21:30.380

Markert, Kel (MSFC-ST11)[UAH]

Creative with it.

01:21:31.900 --> 01:21:34.230

Markert, Kel (MSFC-ST11)[UAH]

I think the main part is just knowing.

01:21:35.080 --> 01:21:38.170

Markert, Kel (MSFC-ST11)[UAH]

What you're building blocks to be creative with our?

01:21:39.210 --> 01:21:39.580

Markert, Kel (MSFC-ST11)[UAH]

So.

01:21:43.010 --> 01:21:43.500

Markert, Kel (MSFC-ST11)[UAH]

Correct.

01:21:44.700 --> 01:21:47.930

Markert, Kel (MSFC-ST11)[UAH]

So that's about all I had some you know.

01:21:48.940 --> 01:21:57.710

Markert, Kel (MSFC-ST11)[UAH]

I'm I'm happy to answer any questions or provide any information or clarification on things if if needed.

01:22:09.660 --> 01:22:10.480

Markert, Kel (MSFC-ST11)[UAH]

Your questions.

01:22:10.540 --> 01:22:10.770

Markert, Kel (MSFC-ST11)[UAH]

Yes.

01:22:12.820 --> 01:22:17.930

Markert, Kel (MSFC-ST11)[UAH]

So I'll actually upload I'll actually save and upload this save.

01:22:22.000 --> 01:22:23.530

Markert, Kel (MSFC-ST11)[UAH]

And.

01:22:29.370 --> 01:22:30.380

Markert, Kel (MSFC-ST11)[UAH]

Sample.

01:22:31.520 --> 01:22:32.250

Markert, Kel (MSFC-ST11)[UAH]

Scripts.

01:22:37.140 --> 01:22:46.850

Markert, Kel (MSFC-ST11)[UAH]

So now that export for what we used for at an iota is available on that drive so you can go back and look at it.

01:22:48.060 --> 01:22:56.860

Markert, Kel (MSFC-ST11)[UAH]

And it actually has that crontab thing right, but just be warned that you may have to change some paths, but just as an example.

01:22:59.110 --> 01:23:18.040

Markert, Kel (MSFC-ST11)[UAH]

OK, so that's all I had, and I hope everybody was you know found this helpful in terms of training and you know what's going on and how to do things and some examples of how to slice and dice and now scale things out.

01:23:19.550 --> 01:23:20.120

Markert, Kel (MSFC-ST11)[UAH]

Uhm.

01:23:21.730 --> 01:23:22.980

Markert, Kel (MSFC-ST11)[UAH]

Yeah, are there any?

01:23:24.120 --> 01:23:26.010

Markert, Kel (MSFC-ST11)[UAH]

One last thing any other questions.

01:23:27.050 --> 01:23:29.470

Markert, Kel (MSFC-ST11)[UAH]

Everybody's been kind of quiet today.

01:23:29.520 --> 01:23:29.700

Markert, Kel (MSFC-ST11)[UAH]

Right.

01:23:30.960 --> 01:23:36.220

Markert, Kel (MSFC-ST11)[UAH]

Separate separate us sitting here by the way if you're wondering who's been talking in the background.

01:23:38.690 --> 01:23:40.000

Markert, Kel (MSFC-ST11)[UAH]

Everybody wave.

01:23:42.620 --> 01:23:59.370

Markert, Kel (MSFC-ST11)[UAH]

So OK well if if not if you don't have any questions. You know you have my email so feel free to reach out there's also I will say 2 if you have like technical questions on Hydra floods or something you know feel free to go to.

01:23:59.780 --> 01:24:03.630

Markert, Kel (MSFC-ST11)[UAH]

Uh you know the GitHub page. I'll post it here in the chat.

01:24:04.470 --> 01:24:05.110

Markert, Kel (MSFC-ST11)[UAH]

Uhm.

01:24:06.200 --> 01:24:08.210

Markert, Kel (MSFC-ST11)[UAH]

And you can go to issues.

01:24:11.180 --> 01:24:14.040

Markert, Kel (MSFC-ST11)[UAH]

So there's sorry there's a GitHub page and then.

01:24:14.920 --> 01:24:26.770

Markert, Kel (MSFC-ST11)[UAH]

Here's the issues so if you have questions to you know feel free to ask or if there's something that's not working correctly. You know feel free to ask on here, too, and we'll be happy to help.

01:24:28.070 --> 01:24:36.200

Markert, Kel (MSFC-ST11)[UAH]

Uh I guess with that concludes the training. I hope everybody found it useful and thanks for your time. I know it's I know it's kind of late.

01:24:36.530 --> 01:24:41.730

Markert, Kel (MSFC-ST11)[UAH]

Uhm for most time zones and it's late here on a Friday so.

01:24:43.430 --> 01:24:45.180

Markert, Kel (MSFC-ST11)[UAH]

Hope everybody has a great weekend.

01:24:46.470 --> 01:24:48.300

Markert, Kel (MSFC-ST11)[UAH]

During their fun activities.

01:24:53.420 --> 01:24:54.410

Markert, Kel (MSFC-ST11)[UAH]

Yes yes.

01:24:54.770 --> 01:24:55.580

Markert, Kel (MSFC-ST11)[UAH]

I don't care.

01:24:56.690 --> 01:24:57.030

Jacob Schenthal

Yeah.

01:24:56.950 --> 01:24:57.300

Markert, Kel (MSFC-ST11)[UAH]

Yeah.

01:24:58.910 --> 01:25:00.280

Markert, Kel (MSFC-ST11)[UAH]

Yeah, of course.

01:25:02.700 --> 01:25:04.430

Markert, Kel (MSFC-ST11)[UAH]

I will stop recording.