00:00:00.000 --> 00:00:01.830
Markert, Kel (MSFC-ST11)[UAH]
Yeah, thank thank you for.
00:00:03.190 --> 00:00:12.270
Markert, Kel (MSFC-ST11)[UAH]
Remind me to record things, Emily just for recording purposes. Today we're going to cover flood mapping and that outline for today is we're going to review.
00:00:12.520 --> 00:00:31.010
Markert, Kel (MSFC-ST11)[UAH]
Uh review water mapping uh give a brief introduction to flood mapping and the different approaches for flood mapping such as classification, differencing change detection and then what do we do with the flood Maps such as estimating flood water depth and then we're going to take? What we talk about in this presentation and walked through an exercise for that.
00:00:33.290 --> 00:00:33.780
Markert, Kel (MSFC-ST11)[UAH]
OK.
00:00:35.000 --> 00:00:35.720
Markert, Kel (MSFC-ST11)[UAH]
So.
00:00:37.810 --> 00:00:47.030
Markert, Kel (MSFC-ST11)[UAH]
Review of the remote sensing side of things for surface water remember, we have 2 types of remote sensing data sets.
00:00:47.500 --> 00:00:53.300
Markert, Kel (MSFC-ST11)[UAH]
Uhm passive remote, sensing an active remote, sensing passive, remote, sensing is optical data.
00:00:53.350 --> 00:00:58.320
Markert, Kel (MSFC-ST11)[UAH]
Right uh active remote, sensing for this training purposes is.
00:00:58.370 --> 00:01:01.270
Markert, Kel (MSFC-ST11)[UAH]
Uh synthetic aperture radar or sar.
00:01:02.000 --> 00:01:13.430
Markert, Kel (MSFC-ST11)[UAH]
Uhm I wanted to review this part because it's going to be important because when we're looking at extracting out floods. There's going to be some nuances associated with these different sing approaches.
00:01:15.120 --> 00:01:41.090
Markert, Kel (MSFC-ST11)[UAH]
Uhm OK, so again optical water mapping. Uh this is looking at the energy that is from the sun. That's being reflected off their surface and so we can combine these wavelengths that are the the received information and certain portions of the electromagnetic spectrum to combine and and extract out? What is in fact water?
00:01:42.130 --> 00:01:55.750
Markert, Kel (MSFC-ST11)[UAH]
And typically when we're doing this we usually extract out a water index with optical data because you can't necessarily say you know what's water, but it's not versus?
00:01:56.320 --> 00:01:59.970
Markert, Kel (MSFC-ST11)[UAH]
Uh you know just the straight spectral information.
00:02:01.460 --> 00:02:03.370
Markert, Kel (MSFC-ST11)[UAH]
Or you can, but it's very difficult.
00:02:04.810 --> 00:02:15.210
Markert, Kel (MSFC-ST11)[UAH]

OK come again with our datasets are is active remote, sensing datasets, you're able to acquire and all weather conditions which makes it really useful for flood mapping.
00:02:15.660 --> 00:02:21.010
Markert, Kel (MSFC-ST11)[UAH]
It measures the amount of energy that the sensor emits.
00:02:22.190 --> 00:02:30.720
Markert, Kel (MSFC-ST11)[UAH]
So sorry this sensor will emit a pulse of energy and what it's reading is that returned amount of energy and so.
00:02:30.770 --> 00:02:47.520
Markert, Kel (MSFC-ST11)[UAH]
So you know if you have no return. It's looking at a smooth or specular reflection. Smooth surface and you have moderate turns which is kind of roughness and then you have strong returns, which is pretty rough surfaces. There's also this property with our data, which are the different.
00:02:49.980 --> 00:03:04.630
Markert, Kel (MSFC-ST11)[UAH]
Which are the different bands and different bands are reading different information and there's some inherent geometry information associated with our data so for example, C band, which is typically 6 centimeters in wavelength.
00:03:05.360 --> 00:03:19.030
Markert, Kel (MSFC-ST11)[UAH]
Uh it doesn't necessarily penetrate canopy layers and so you know get backscatter from vegetation canopy 's and stuff versus L band where it's longer wavelength 24 centimeters and it can penetrate canopy 's.
00:03:20.730 --> 00:03:29.870
Markert, Kel (MSFC-ST11)[UAH]
Excuse me so this is a kind of again. This is an important property with our because if you have flooded forests. You're actually not going to be able to detect that.
00:03:30.660 --> 00:03:36.390
Markert, Kel (MSFC-ST11)[UAH]
Actually, with most remote, sensing data, sets, you're not going to really be able to detect.
00:03:36.960 --> 00:03:39.270
Markert, Kel (MSFC-ST11)[UAH]
Uh inundacion underneath.
00:03:39.870 --> 00:03:41.020
Markert, Kel (MSFC-ST11)[UAH]
A dense canopy 's.
00:03:42.180 --> 00:03:44.610
Markert, Kel (MSFC-ST11)[UAH]
Versus L band you actually do get some of that.
00:03:45.790 --> 00:04:03.380
Markert, Kel (MSFC-ST11)[UAH]
OK UM again with our data you're looking at specular reflection or low intensity backscatter and with land in this case. We're highlighting vegetation. You have brighter backscatter and we can use that to distinguish the different land cover classes.
00:04:07.350 --> 00:04:15.550
Markert, Kel (MSFC-ST11)[UAH]
So a quick review on thresholding algorithms. You know there. There's image segmentation there's also.
00:04:17.080 --> 00:04:21.570
Markert, Kel (MSFC-ST11)[UAH]
You know more advanced kind of thresholding algorithms like machine learning or.
00:04:23.660 --> 00:04:39.240
Markert, Kel (MSFC-ST11)[UAH]
Yeah, things like that, and so in that case, basically all you're trying to do is classify you know what is water for the for the image and we use the properties associated with image and and the different types of sensors to extract that information.

00:04:40.090 --> 00:04:43.210
Markert, Kel (MSFC-ST11)[UAH]
I wanted to touch upon this again because we will talk about.
00:04:43.270 --> 00:04:47.260
Markert, Kel (MSFC-ST11)[UAH]
Uh you know reuse some thresholding algorithms and then.
00:04:47.310 --> 00:04:47.720
Markert, Kel (MSFC-ST11)[UAH]
Uhm.
00:04:47.770 --> 00:04:48.090
Markert, Kel (MSFC-ST11)[UAH]
Right.
00:04:48.990 --> 00:04:52.860
Markert, Kel (MSFC-ST11)[UAH]
Uh we kind of use it for some some flood mapping too.
00:04:55.930 --> 00:05:09.460
Markert, Kel (MSFC-ST11)[UAH]
OK, before I get into flood mapping are there I just wanted to quickly pause and ask are there any questions on what we went over the other day or are there any questions on the review?
00:05:10.680 --> 00:05:11.040
Markert, Kel (MSFC-ST11)[UAH]
Pardon.
00:05:13.190 --> 00:05:14.820
Markert, Kel (MSFC-ST11)[UAH]
OK, awesome.
00:05:17.850 --> 00:05:20.280
Markert, Kel (MSFC-ST11)[UAH]
Sorry I haven't really scratchy throat and.
00:05:21.700 --> 00:05:25.330
Markert, Kel (MSFC-ST11)[UAH]
So I'm trying to clear it a bit I apologize.
00:05:26.920 --> 00:05:43.090
Markert, Kel (MSFC-ST11)[UAH]
OK so going into flood mapping as I mentioned earlier you know what our sensors actually see is not flood versus not flood. It's just water and so in that case what we need to do is take some sort of of.
00:05:44.640 --> 00:05:51.570
Markert, Kel (MSFC-ST11)[UAH]
Information from before or historical information and say you know what is flooding from that.
00:05:53.190 --> 00:06:04.960
Markert, Kel (MSFC-ST11)[UAH]
And so we can do that a couple different ways. You know on the right here. I wanted to show this is an image of. They call an experimental product, but they produce it operationally.
00:06:06.620 --> 00:06:21.560
Markert, Kel (MSFC-ST11)[UAH]
This is the Modis flood Maps and so you can go and basically go to any think it's 10 degree by 10 degree tile and get flood Maps. I think this was a flood map from very recently, and so there's floods going on and.
00:06:23.110 --> 00:06:33.940
Markert, Kel (MSFC-ST11)[UAH]
Thailand and some in Cambodia and we'll talk about kind of how they extract that basically they they look at permanent water and observed water and just do some differences.
00:06:35.500 --> 00:06:36.110
Markert, Kel (MSFC-ST11)[UAH]
Uhm.

00:06:37.410 --> 00:06:37.830
Markert, Kel (MSFC-ST11)[UAH]
OK.
00:06:39.930 --> 00:06:41.880
Markert, Kel (MSFC-ST11)[UAH]
And so as I mentioned.
00:06:43.370 --> 00:06:47.550
Markert, Kel (MSFC-ST11)[UAH]
We can kind of classify flood mapping into 2 different approaches. One is kind of.
00:06:49.320 --> 00:07:00.260
Markert, Kel (MSFC-ST11)[UAH]
Uh I call it classification, differencing I don't really know if there's a proper term for it. But basically you're looking at what you detected as water and what is permanent water and you're just looking at the differences between those?
00:07:00.990 --> 00:07:01.580
Markert, Kel (MSFC-ST11)[UAH]
Uhm.
00:07:02.650 --> 00:07:03.350
Markert, Kel (MSFC-ST11)[UAH]
And so.
00:07:04.560 --> 00:07:05.530
Markert, Kel (MSFC-ST11)[UAH]
No, that's OK, thank you.
00:07:08.270 --> 00:07:13.720
Markert, Kel (MSFC-ST11)[UAH]
And so we use, some sort of historical information to determine what is permanent water?
00:07:14.290 --> 00:07:23.890
Markert, Kel (MSFC-ST11)[UAH]
Uhm into possible sources from this there is a really great data set called the JRC global surface water mapping layers that's already.
00:07:25.050 --> 00:07:32.650
Markert, Kel (MSFC-ST11)[UAH]
Pre or that's already readily available in Earth engine and so that's something that we can pull in and we'll explore that a little later.
00:07:33.970 --> 00:07:35.260
Markert, Kel (MSFC-ST11)[UAH]
During this training session.
00:07:36.710 --> 00:07:41.920
Markert, Kel (MSFC-ST11)[UAH]
Or another way of doing it is, you can process all the imagery for your region and derive permanent water.
00:07:42.850 --> 00:07:43.550
Markert, Kel (MSFC-ST11)[UAH]
Uhm.
00:07:45.040 --> 00:07:45.740
Markert, Kel (MSFC-ST11)[UAH]
There's
00:07:46.940 --> 00:07:58.560
Markert, Kel (MSFC-ST11)[UAH]
uhm pros and cons to both approaches and I don't have an example. But maybe if you don't mind some live coding. We can try doing an example of this and seeing what happens.
00:07:59.730 --> 00:08:08.560
Markert, Kel (MSFC-ST11)[UAH]
But basically when you're for these Jersey. These are really good datasets. And this is actually one of the Maps that we've created for the hurricane at an iota.

00:08:08.610 --> 00:08:22.010
Markert, Kel (MSFC-ST11)[UAH]
The other responses and you can see here that we're trying to extract I mean. Basically, the The Red area is looking at the differences and what we extracted versus what the The Blue area is what the JRC.
00:08:22.600 --> 00:08:25.770
Markert, Kel (MSFC-ST11)[UAH]
A data set is saying it's permanent water.
00:08:28.010 --> 00:08:35.080
Markert, Kel (MSFC-ST11)[UAH]
OK, so there's a couple different ways that we can do this, too, so focusing purely on this chair seed data set.
00:08:36.530 --> 00:08:40.060
Markert, Kel (MSFC-ST11)[UAH]
Sorry my slides are a little laggy.
00:08:42.150 --> 00:09:02.180
Markert, Kel (MSFC-ST11)[UAH]
So looking at this geraci datasets. There's a couple different ways that we can slice and dice historical information. One of the ways that one of the data sets that they provide is just a yearly data so for the whole of 2020. They look at all. The data and say what is permanent water and what is seasonal water right?
00:09:02.920 --> 00:09:25.360
Markert, Kel (MSFC-ST11)[UAH]
And so we can take that information and then use that and compare it against what we observe is water and extract out floods and we'll go through this example today and make this map. This is just a screenshot of me testing things and basically the blue here. The dark blue is the JRC data and the kind of lighter red is.
00:09:25.870 --> 00:09:29.650
Markert, Kel (MSFC-ST11)[UAH]
Uhm what we're extracting out from these yearly permanent water layers.
00:09:30.600 --> 00:09:31.090
Markert, Kel (MSFC-ST11)[UAH]
Right.
00:09:32.540 --> 00:09:36.410
Markert, Kel (MSFC-ST11)[UAH]
The The light red pinkish areas? Yeah.
00:09:39.990 --> 00:10:02.060
Markert, Kel (MSFC-ST11)[UAH]
OK so the next approach is JRC the this data set also has what's called a a an occurrence layer and So what they've done is for each month, they identified? What is water versus not water and 2 for reference. The JRC data set goes back to 1985 so it's monthly water datasets from 1985.
00:10:02.900 --> 00:10:32.930
Markert, Kel (MSFC-ST11)[UAH]
And so basically they've taken that and reduce that down into a single layer that basically saying the number of observations that they've seen throughout this entire time period at each month time step is water and so that data set is basically zero to 100 in terms of occurrence and so you can threshold that and say, 75% is permanent water or everything above 75%.
00:10:32.990 --> 00:10:36.620
Markert, Kel (MSFC-ST11)[UAH]
A permanent water and we will use that as our permanent water layer.
00:10:37.510 --> 00:10:38.240
Markert, Kel (MSFC-ST11)[UAH]
Uhm.
00:10:39.750 --> 00:10:40.510
Markert, Kel (MSFC-ST11)[UAH]
So.
00:10:42.750 --> 00:11:06.480
Markert, Kel (MSFC-ST11)[UAH]

Yes, we will talk about sorry I was thinking about some nuances associated with that, if you kind of toggle between the 2 you can kind of see that one estimates more floods than the other, but it's not necessarily that it's wrong. But it's looking at a little bit of different things. Right and so depending on your use case you may you choose to use either or.
00:11:07.570 --> 00:11:30.790
Markert, Kel (MSFC-ST11)[UAH]
OK, the last one is Jersey similarly to how they've taken the entire data set and reduced it down to occurrence. They've actually done this for individual months, too, so they've so from 1985 to present they've taken every October and said how many times in October. Do we see water and that's our monthly occurrence?
00:11:31.800 --> 00:11:42.650
Markert, Kel (MSFC-ST11)[UAH]
And so from there, so, so we can use that information and say for the month of October. We expect these areas to be considered permanent water.
00:11:43.820 --> 00:11:48.720
Markert, Kel (MSFC-ST11)[UAH]
Uh we can eat by think of why that might be advantageous. It kind of talked about a little earlier.
00:11:49.490 --> 00:11:50.380
Markert, Kel (MSFC-ST11)[UAH]
Our water in spring.
00:11:51.870 --> 00:12:08.280
Markert, Kel (MSFC-ST11)[UAH]
He said there's some areas where it's predictable and then use it for different agriculture or whatever. Yeah, yeah for the most part I mean, there. There's seasons right. We have rainy seasons, or monsoon or or something and so those areas tend to be.
00:12:08.880 --> 00:12:20.990
Markert, Kel (MSFC-ST11)[UAH]
You you get flag and so you know, flooding and you know, we're here in Utah. There's a lot more water in the spring right and so there's more flooding this spring. Just like more awkward like it's like.
00:12:21.530 --> 00:12:22.110
Markert, Kel (MSFC-ST11)[UAH]
That's right.
00:12:22.390 --> 00:12:24.080
Markert, Kel (MSFC-ST11)[UAH]
But OK.
00:12:24.440 --> 00:12:34.880
Markert, Kel (MSFC-ST11)[UAH]
More water in general, so you know, there's more water in the spring versus in the fall. And so you know, those kind of you know you can take those differences into account by using this approach.
00:12:36.540 --> 00:12:37.100
Markert, Kel (MSFC-ST11)[UAH]
OK.
00:12:39.860 --> 00:12:42.820
Markert, Kel (MSFC-ST11)[UAH]
Are there any questions on those?
00:12:44.160 --> 00:12:45.700
Markert, Kel (MSFC-ST11)[UAH]
You know what we just talked about.
00:12:47.360 --> 00:13:18.030
Markert, Kel (MSFC-ST11)[UAH]
So I guess the the monthly image would be anywhere that there's been water detected is going to that, red spot basically right. It's going to be one of those spots where it's perfect for that season, yeah, so, so the question was that if there's any if it's detected water at any point within the month. It's considered permanent that's not necessarily the case because what they do is they look at occurrence as well. So these datasets RR zero to 100 and in terms of like percent.

00:13:18.210 --> 00:13:37.360
Markert, Kel (MSFC-ST11)[UAH]
Parents and so like we kind of talked about with the with the full water occurrence layer. You can kind of, say like anything above 75% is for the month of October, is considered water. Yeah, thank you. That was actually a good question. I failed to mention that so.
00:13:38.400 --> 00:13:38.970
Markert, Kel (MSFC-ST11)[UAH]
Uhm.
00:13:40.410 --> 00:13:52.860
Markert, Kel (MSFC-ST11)[UAH]
Yeah, so I did mention to. I uh I did mention that they you can do this for you know, some other datasets, so if you want to go back and.
00:13:53.550 --> 00:13:59.510
Markert, Kel (MSFC-ST11)[UAH]
Uh recompute all this stuff you can I think these are valid approaches and in sometimes you might want to do that?
00:14:00.120 --> 00:14:05.270
Markert, Kel (MSFC-ST11)[UAH]
Because there are inherent differences between optical and SAR and those.
00:14:06.240 --> 00:14:08.470
Markert, Kel (MSFC-ST11)[UAH]
Difference is kind of come out in.
00:14:09.480 --> 00:14:13.220
Markert, Kel (MSFC-ST11)[UAH]
Wow, the Maps or the the flood Maps so.
00:14:14.660 --> 00:14:19.280
Markert, Kel (MSFC-ST11)[UAH]
Yeah, there might be a case where it's beneficial to go through and.
00:14:20.350 --> 00:14:22.250
Markert, Kel (MSFC-ST11)[UAH]
That process all of this our data.
00:14:23.700 --> 00:14:27.050
Markert, Kel (MSFC-ST11)[UAH]
But that depends on your time and resources and everything.
00:14:28.400 --> 00:14:36.630
Markert, Kel (MSFC-ST11)[UAH]
OK and uh the other approach that I want to talk about So what we just talked about was kind of like.
00:14:37.480 --> 00:14:50.080
Markert, Kel (MSFC-ST11)[UAH]
Uhm differencing of of classified Maps so we have some reference map that says what's we usually have and and our observation that we say.
00:14:50.140 --> 00:15:13.880
Markert, Kel (MSFC-ST11)[UAH]
Say This is a flood event and you just kind of overlay, those and and what could the differences and this next approach for flood mapping. We're actually looking at change detection and what this is looking at is the actual values of the uh between pre and post event for the sensor so if you look at this is and will go through this example and in the notebooks.
00:15:14.640 --> 00:15:19.710
Markert, Kel (MSFC-ST11)[UAH]
But if you look at this example, and and so you so this is.
00:15:21.420 --> 00:15:38.330
Markert, Kel (MSFC-ST11)[UAH]
Uh a River in Guatemala and the 4 September and then this is what this The Sentinel, one has observed during the hurricane event. And so you can you can kind of see those differences right and so you want to be able to extract out those differences?

00:15:38.990 --> 00:15:39.270
Markert, Kel (MSFC-ST11)[UAH]
Yeah.
00:15:40.400 --> 00:15:43.730
Markert, Kel (MSFC-ST11)[UAH]
So one of the famous.
00:15:44.490 --> 00:15:47.960
Markert, Kel (MSFC-ST11)[UAH]
Differencing approach for SAR is called the.
00:15:51.100 --> 00:16:08.170
Markert, Kel (MSFC-ST11)[UAH]
I'm blanking on it log amplitude ratio and so basically with that what you're doing is you're taking your pre image and your post image. You're taking the amplitude data for SAR and you're just taking ratio of that.
00:16:09.440 --> 00:16:18.390
Markert, Kel (MSFC-ST11)[UAH]
And So what you get out of that is where dark areas are this is again. We'll go through this case, where dark areas are the flooding and so you can kind of see that.
00:16:18.840 --> 00:16:20.270
Markert, Kel (MSFC-ST11)[UAH]
Uh if you
00:16:20.970 --> 00:16:28.170
Markert, Kel (MSFC-ST11)[UAH]
Go through the slides and kind of, say OK. Here's our pre image. Here's our post image or during event image and.
00:16:28.870 --> 00:16:31.540
Markert, Kel (MSFC-ST11)[UAH]
That's our log amplitude ratio.
00:16:32.440 --> 00:16:34.890
Markert, Kel (MSFC-ST11)[UAH]
Is the lighter purple like it's less sure if it's water?
00:16:36.040 --> 00:16:47.870
Markert, Kel (MSFC-ST11)[UAH]
Or is it just it's still identifying it as well. Yeah, that's a good question. So the question was is light purple, saying that it's water or like lower probability of water or?
00:16:48.940 --> 00:17:02.320
Markert, Kel (MSFC-ST11)[UAH]
Yeah is that that's question OK, yeah, so in this case. This is just like this is a continuous value right so this is just like we, we took the ratio between the 2 images and that's this and that's that.
00:17:03.380 --> 00:17:14.820
Markert, Kel (MSFC-ST11)[UAH]
What we need to do at this point to actually say it's like floods we need to classify that and so at that point you can just throw it in a thresholding algorithm and say you know what's dark versus? What's not kind of thing.
00:17:16.070 --> 00:17:16.450
Markert, Kel (MSFC-ST11)[UAH]
So.
00:17:17.080 --> 00:17:17.930
Markert, Kel (MSFC-ST11)[UAH]
This is before you.
00:17:19.120 --> 00:17:38.770
Markert, Kel (MSFC-ST11)[UAH]
Identify the water, yes, yeah, so you. You you do you do the log amplitude ratio and then you throw it into that thresholding algorithm and it will give you water so instead of just like classifying straight water. You're looking at the the the change. And then you're trying to classify water, which is in that case floods.

00:17:42.190 --> 00:17:42.750
Markert, Kel (MSFC-ST11)[UAH]
OK.
00:17:45.750 --> 00:17:51.010
Markert, Kel (MSFC-ST11)[UAH]
I don't have a good example of this OK, so remember when I was mentioning that comparing.
00:17:51.440 --> 00:17:56.370
Markert, Kel (MSFC-ST11)[UAH]
A star data to optical data in some cases, you might not want to do that.
00:17:57.220 --> 00:18:08.170
Markert, Kel (MSFC-ST11)[UAH]
And remember when we're looking at our slides on Monday and I said, You Know in in arid region. What looks like water? What doesn't look like water and then the dark shadows?
00:18:09.060 --> 00:18:12.090
Markert, Kel (MSFC-ST11)[UAH]
Yeah, well the Sandy areas were not water.
00:18:13.040 --> 00:18:28.430
Markert, Kel (MSFC-ST11)[UAH]
That happens basically everywhere and so this is an example of a flood map in Cambodia and I just wanted to highlight that we extracted floods. The Red area from the Jersey datasets and like this area here. These are all sandbars.
00:18:29.740 --> 00:18:57.510
Markert, Kel (MSFC-ST11)[UAH]
So, in this case, it's incorrectly classifying floods as sandbars. But in the SAR imagery. It looks like water because it of that specular reflection or low backscatter values and so in this case, it would probably be beneficial, either to apply. This log amplitude ratio approach or have some historical information of SAR data that we can compare to.
00:18:58.990 --> 00:18:59.980
Markert, Kel (MSFC-ST11)[UAH]
If that makes sense.
00:19:01.000 --> 00:19:02.880
Markert, Kel (MSFC-ST11)[UAH]
OK, I just wanted to touch on that.
00:19:04.400 --> 00:19:05.090
Markert, Kel (MSFC-ST11)[UAH]
So.
00:19:06.470 --> 00:19:26.460
Markert, Kel (MSFC-ST11)[UAH]
The the other the last thing that we'll talk about and and look at today is estimating flood water depth. So a lot of times you know it's it's pretty straightforward to estimate extent from these datasets right. It's pretty natural right. You're looking down, saying OK that's where it's at.
00:19:27.910 --> 00:19:42.520
Markert, Kel (MSFC-ST11)[UAH]
It's not as straight and in extent is somewhat of an indicator of of impact on on a you know of a flooding event, but really once you're looking at like like impact in terms of damages and and.
00:19:44.720 --> 00:20:00.630
Markert, Kel (MSFC-ST11)[UAH]
Yeah, damages and losses and everything like that. Uh you want some indication of like depth right because it is like the more it's it's flooded the more damage. There is or the more like crop loss or what happened right and so there's been some tools that have been developed.
00:20:01.250 --> 00:20:17.610
Markert, Kel (MSFC-ST11)[UAH]
Come to estimate flood water depth and I I do want to say like take it with a grain of salt. It's not going to be like within centimeters accuracy. Maybe within meters accuracy. But it's highly dependent on your digital elevation model and in this case.

00:20:18.360 --> 00:20:29.470
Markert, Kel (MSFC-ST11)[UAH]
Yeah, we took the the flood layers. I'm just going to talk with that again. We took the this water map that we created and then ran the depth estimation and you can kind of see where.
00:20:30.830 --> 00:20:43.470
Markert, Kel (MSFC-ST11)[UAH]
It's giving you a value where dark blue areas are like 5 meters and greater in depth and then these like this really bright yellow like this area here is like one meter in depth.
00:20:44.680 --> 00:20:45.210
Markert, Kel (MSFC-ST11)[UAH]
Uhm.
00:20:46.140 --> 00:21:02.830
Markert, Kel (MSFC-ST11)[UAH]
And you know, I said take it with a grain of salt. I mean, you can see in the in the River. We don't actually have bathymetry information. We don't have any DM information. And so it kind of does this thing. So where there's not good elevation information you can get some artifacts.
00:21:04.980 --> 00:21:21.200
Markert, Kel (MSFC-ST11)[UAH]
Probably a good way of doing it is just using the flood Maps and we'll do that, today, so that way you're not taking into account any kind of permanent water. But for the most part. This can give you a decent estimate of flood water depth.
00:21:23.470 --> 00:21:23.970
Markert, Kel (MSFC-ST11)[UAH]
OK.
00:21:25.100 --> 00:21:26.330
Markert, Kel (MSFC-ST11)[UAH]
Any questions.
00:21:29.780 --> 00:21:42.410
Markert, Kel (MSFC-ST11)[UAH]
Hello is our sometimes gets sounds like sandbars in that case is treated as well. It's my point is that again.
00:21:43.210 --> 00:21:52.720
Markert, Kel (MSFC-ST11)[UAH]
So yeah, so start, sending the the question was why this are kind of like have dark areas for Sands and so the.
00:21:53.770 --> 00:21:55.160
Markert, Kel (MSFC-ST11)[UAH]
The idea behind it is like.
00:21:56.480 --> 00:22:18.780
Markert, Kel (MSFC-ST11)[UAH]
It's it's since the beam right and then the beam is going to either skip off the ground, it's either going to like kind of get in there and the signals gotta get lost or you're going to get some return back and and somewhere in between there right so it so some signal can get lost. And then you'll get some back or you could just get a really strong signal back in the case of sand.
00:22:19.550 --> 00:22:30.650
Markert, Kel (MSFC-ST11)[UAH]
The source signal actually penetrates a bit and then because the sand is like very grainy and it basically it scatters within the sand and then you just lose the signal.
00:22:30.980 --> 00:22:33.270
Markert, Kel (MSFC-ST11)[UAH]
OK, great, thanks it bounced off.
00:22:34.390 --> 00:22:43.330
Markert, Kel (MSFC-ST11)[UAH]
Exactly yeah, so SARS, yeah, it's not even like it's not even reading if it's bounced off or not. It's just reading what has returned so.

00:22:44.760 --> 00:22:55.760
Markert, Kel (MSFC-ST11)[UAH]
Yeah, that in that case that's what that's what happens and then there's also like the soils, too, like with our data, depending on the soil moisture you can get different.
00:22:55.820 --> 00:23:17.760
Markert, Kel (MSFC-ST11)[UAH]
Uhm views of what's going on right so I'm I'm actually not super familiar with this. But like in some cases, I know for dry Sandy soils. You just lose the signal right. But in some cases, you can get like wet soils and you can get maybe a bright signal R or something in between. And so I.
00:23:19.300 --> 00:23:28.700
Markert, Kel (MSFC-ST11)[UAH]
Uh I think it has to do something with the dielectric constant of slow or the water anyways. So I'm not. I'm not a soil remote sensing.
00:23:29.690 --> 00:23:34.190
Markert, Kel (MSFC-ST11)[UAH]
Uh I just am familiar with that, you lose the signal in the sand.
00:23:34.960 --> 00:23:35.490
Markert, Kel (MSFC-ST11)[UAH]
Gotcha.
00:23:36.320 --> 00:23:42.410
Markert, Kel (MSFC-ST11)[UAH]
But there are cases where they use our data like Sentinel, 12 like estimates oyster OK so.
00:23:44.240 --> 00:23:44.610
Markert, Kel (MSFC-ST11)[UAH]
OK.
00:23:45.670 --> 00:23:47.410
Markert, Kel (MSFC-ST11)[UAH]
Uh any other questions.
00:23:49.530 --> 00:23:51.380
Markert, Kel (MSFC-ST11)[UAH]
Looking at the chat I don't see anything.
00:23:53.720 --> 00:24:02.400
Markert, Kel (MSFC-ST11)[UAH]
A meal, the question is, is that your dog. He taught programming to no that is not my dog. I do not have a Golden retriever.
00:24:05.140 --> 00:24:20.350
Markert, Kel (MSFC-ST11)[UAH]
OK, so you know if if there are questions. Feel free to put them in the chat and you know, someone like a mule or amander bitblt off or somebody will let me know, and we will get your question answered.
00:24:21.710 --> 00:24:32.860
Markert, Kel (MSFC-ST11)[UAH]
OK, so moving on, I'm going to open up. The notebook and those who are following along can do so as well. Can you see my notebook or is it still the presentation?
00:24:34.390 --> 00:24:39.130
Cherrington, Emil A. (MSFC-ST11)[UAH]
We can see the notebook and then just a quick, one killer. You're gonna re share the link to the notebook.
00:24:36.830 --> 00:24:37.600
Markert, Kel (MSFC-ST11)[UAH]
Just a quick.
00:24:41.530 --> 00:24:44.760
Markert, Kel (MSFC-ST11)[UAH]
Uh yeah, let me actually I could just put it in the chat here.

00:24:45.600 --> 00:24:49.930
Cherrington, Emil A. (MSFC-ST11)[UAH]
Yeah, 'cause it since you said follow along and I assume that means you're gonna share it in the chat.
00:24:51.470 --> 00:24:53.990
Markert, Kel (MSFC-ST11)[UAH]
Yeah, there, you go sorry thank you a meal.
00:24:56.910 --> 00:25:07.880
Markert, Kel (MSFC-ST11)[UAH]
OK, so again as we did on Monday. We are going to go through some setup so to begin you'll need to.
00:25:08.670 --> 00:25:13.810
Markert, Kel (MSFC-ST11)[UAH]
Connect to the notebook so up here on the right you can just click connect.
00:25:15.240 --> 00:25:21.510
Markert, Kel (MSFC-ST11)[UAH]
And you'll see that it'll be it'll say connecting initializing and then once it's connected you should see this.
00:25:23.530 --> 00:25:23.990
Markert, Kel (MSFC-ST11)[UAH]
Our check.
00:25:25.090 --> 00:25:28.450
Markert, Kel (MSFC-ST11)[UAH]
Oh, I forgot to mention OK, so last.
00:25:29.270 --> 00:25:36.090
Markert, Kel (MSFC-ST11)[UAH]
Uh on Monday, someone was asking about exporting things will go through an example today of exporting things.
00:25:37.420 --> 00:25:43.870
Markert, Kel (MSFC-ST11)[UAH]
Just just to show you like what the timing for exporting is.
00:25:44.460 --> 00:25:53.380
Markert, Kel (MSFC-ST11)[UAH]
These 16 minutes, 11 minutes and 25 minute. Those were for this case that we're going to go through which I think is.
00:25:54.560 --> 00:25:57.860
Markert, Kel (MSFC-ST11)[UAH]
Belize Guatemala, Honduras, El Salvador, Nicaragua.
00:25:58.830 --> 00:26:10.820
Markert, Kel (MSFC-ST11)[UAH]
So it's a pretty large area granted we don't have full coverage of imagery for these areas, but you can see how we can process a good amount of imagery and export things within a reasonable amount of time.
00:26:12.800 --> 00:26:13.210
Markert, Kel (MSFC-ST11)[UAH]
So.
00:26:14.280 --> 00:26:18.010
Markert, Kel (MSFC-ST11)[UAH]
Just wanted to note that so once you're connected.
00:26:19.790 --> 00:26:37.840
Markert, Kel (MSFC-ST11)[UAH]
You'll go ahead and run this cell again. This is to connect to Google Drive and so you know once you hit run. You'll get this URL you just click that and you can sign in just click. The account that you want to use and then sign in.
00:26:39.130 --> 00:26:47.480
Markert, Kel (MSFC-ST11)[UAH]
I'll give you this authentication code just copy that by clicking this and go over and paste and hit enter.
00:26:50.700 --> 00:26:52.530
Markert, Kel (MSFC-ST11)[UAH]
So once that's completed.

00:26:54.410 --> 00:27:04.920
Markert, Kel (MSFC-ST11)[UAH]
Again, you should see it should say mounted at content drive and then if you. Refresh your folders. You can see drive and my drive and all your stuff in there.
00:27:06.220 --> 00:27:07.400
Markert, Kel (MSFC-ST11)[UAH]
OK, UM.
00:27:08.220 --> 00:27:16.120
Markert, Kel (MSFC-ST11)[UAH]
After we're connected to Google Drive. We will install Hydra floods and GE map will use this for.
00:27:16.170 --> 00:27:23.480
Markert, Kel (MSFC-ST11)[UAH]
Or uh you know again Hydra floods is the package for the surface water and flood mapping and GE map is for?
00:27:26.350 --> 00:27:37.690
Markert, Kel (MSFC-ST11)[UAH]
Uh for just creating Maps so you'll see a bunch of stuff happen and at the end. It will say you must restart do not worry about that do not restart.
00:27:38.650 --> 00:27:39.280
Markert, Kel (MSFC-ST11)[UAH]
Uhm.
00:27:40.010 --> 00:27:44.530
Markert, Kel (MSFC-ST11)[UAH]
And then we can move on so at this point we're importing in all of our packages.
00:27:46.430 --> 00:27:48.980
Markert, Kel (MSFC-ST11)[UAH]
And we will hit.
00:27:49.970 --> 00:27:51.200
Markert, Kel (MSFC-ST11)[UAH]
Oops that was weird.
00:27:52.910 --> 00:27:54.710
Markert, Kel (MSFC-ST11)[UAH]
Did not mean to do that so once?
00:27:55.720 --> 00:28:13.770
Markert, Kel (MSFC-ST11)[UAH]
You have your packages import you'll go to GE map run this and then we can authenticate much like we did for Google Drive, where it lasts a Google Earth engine wants to access your account allow it copy your authentication code and paste in here.
00:28:16.870 --> 00:28:17.430
Markert, Kel (MSFC-ST11)[UAH]
OK.
00:28:18.520 --> 00:28:23.650
Markert, Kel (MSFC-ST11)[UAH]
For all those following along were you able to successfully.
00:28:24.490 --> 00:28:27.090
Markert, Kel (MSFC-ST11)[UAH]
Authenticated and get everything and imported.
00:28:28.530 --> 00:28:29.430
Markert, Kel (MSFC-ST11)[UAH]
If not,
00:28:30.780 --> 00:28:31.410
Markert, Kel (MSFC-ST11)[UAH]
say something.

00:28:32.270 --> 00:28:32.670
Markert, Kel (MSFC-ST11)[UAH]
OK.
00:28:34.890 --> 00:28:35.370
Markert, Kel (MSFC-ST11)[UAH]
OK.
00:28:36.150 --> 00:28:51.060
Markert, Kel (MSFC-ST11)[UAH]
Cool so to begin this we're going to do another recap of surface water mapping using the Hydra floods. API this will be very quick you know, not as labor says the uh on Monday, so.
00:28:52.420 --> 00:29:02.030
Markert, Kel (MSFC-ST11)[UAH]
What we're doing here so I think last time I showed an example of using this helper function called Country B box or country bounding box.
00:29:03.150 --> 00:29:12.600
Markert, Kel (MSFC-ST11)[UAH]
And what this does is you just give it a name of country and he'll give you the bounding box for that country So what if you want to process a lot of countries. This is how you do it.
00:29:12.650 --> 00:29:12.980
Markert, Kel (MSFC-ST11)[UAH]
Yes.
00:29:14.590 --> 00:29:20.370
Markert, Kel (MSFC-ST11)[UAH]
You'll just wrap it in this feature collection and then you can just list all the countries that you're interested in.
00:29:23.700 --> 00:29:25.890
Markert, Kel (MSFC-ST11)[UAH]
OK so once we have that.
00:29:26.980 --> 00:29:39.070
Markert, Kel (MSFC-ST11)[UAH]
We're going to so now we have a region and we're going to focus on a date that has some good amount of imagery for the hurricane edit iota case.
00:29:39.890 --> 00:29:55.280
Markert, Kel (MSFC-ST11)[UAH]
Uh and this point, it's November 6 for 2020 and we'll just go ahead and run that and get the data. We can check and will see that we have 9 images that we're going to process and will show an example of this.
00:29:56.310 --> 00:29:56.930
Markert, Kel (MSFC-ST11)[UAH]
Uhm.
00:29:58.100 --> 00:30:17.640
Markert, Kel (MSFC-ST11)[UAH]
So again we need to do a trend correction on our data so at and and we'll do some kind of hand masking at the end like we talked about on Monday. And so here we're just getting a a DM and the height above nearest drainage from that same data set.
00:30:18.870 --> 00:30:25.700
Markert, Kel (MSFC-ST11)[UAH]
And in this case, we are applying the slope correction or the trend correction to the Sentinel, one data sets.
00:30:26.830 --> 00:30:34.110
Markert, Kel (MSFC-ST11)[UAH]
And we're applying our special filter can anyone. Tell me why we want to do those 2 processes for SAR.
00:30:38.190 --> 00:30:53.390
Markert, Kel (MSFC-ST11)[UAH]
Sparkles right the parking right things right, but it's just like let's all just like random random stuff. Yeah, yeah, so Sarah had like just how it's acquired it just has some random noise associated with it. So the special filter helps with that and flattening is shadows or dark?

00:30:53.440 --> 00:31:12.110
Markert, Kel (MSFC-ST11)[UAH]
Right so you want to not exactly sure how it works, but yeah, yeah, so uh exactly Travis so you have your look angle for your for your satellite and it's looking kind of not necessarily oblique, but it hasn't at an angle and so you can get shadows on the back of the mountains and yeah.
00:31:13.550 --> 00:31:30.470
Markert, Kel (MSFC-ST11)[UAH]
OK, so you don't so when you're doing this operationally you don't necessarily need to do this aggregation process because it will happen when you export. But just for visualization purposes. We're going to do this aggregation this is some visualization.
00:31:31.350 --> 00:31:34.630
Markert, Kel (MSFC-ST11)[UAH]
And we're just going to visualize our data set that we're processing.
00:31:35.730 --> 00:31:42.160
Markert, Kel (MSFC-ST11)[UAH]
And so you can see that at this point we requested a lot of data.
00:31:43.660 --> 00:31:46.000
Markert, Kel (MSFC-ST11)[UAH]
But it may not be all this data.
00:31:47.130 --> 00:31:53.060
Markert, Kel (MSFC-ST11)[UAH]
So here's the here's the regions that were processing as you saw we just got the bounding boxes for these.
00:31:53.620 --> 00:31:59.080
Markert, Kel (MSFC-ST11)[UAH]
5 countries, I'm going to actually zoom into an area and Guatemala.
00:31:59.920 --> 00:32:01.590
Markert, Kel (MSFC-ST11)[UAH]
That I know we have the imagery for.
00:32:02.730 --> 00:32:13.880
Markert, Kel (MSFC-ST11)[UAH]
And here we go starting get imagery wonder if I zoom out if it will actually process for there should be a swath over here and a swath over here.
00:32:14.940 --> 00:32:16.350
Markert, Kel (MSFC-ST11)[UAH]
So so 2 swaths.
00:32:17.640 --> 00:32:19.260
Markert, Kel (MSFC-ST11)[UAH]
Well let that load for a second.
00:32:27.710 --> 00:32:29.350
Markert, Kel (MSFC-ST11)[UAH]
Come on Earth engine you can do it.
00:32:31.530 --> 00:32:44.930
Markert, Kel (MSFC-ST11)[UAH]
Did you ask the unmasked thing? When you have oceans involved? Yes, so the question was do. You wanna so for Dems data do you want to use this unmask when oceans are involved?
00:32:45.530 --> 00:32:47.050
Markert, Kel (MSFC-ST11)[UAH]
And the answer is yes.
00:32:47.110 --> 00:32:55.350
Markert, Kel (MSFC-ST11)[UAH]
Yes, that's because you know, these datasets just assume that there's no data over oceans.
00:32:56.490 --> 00:33:19.510
Markert, Kel (MSFC-ST11)[UAH]
And sometimes you'll just have an acquisition over oceans and so to prevent your processing pipeline. We will talk

about this. A little more on Friday but basically you want to prevent your processing pipeline for breaking so if it fails on one image. It'll fail on all of them and so you just kind of want to make sure that it has all the data to process.
00:33:20.690 --> 00:33:21.250
Markert, Kel (MSFC-ST11)[UAH]
Good question.
00:33:21.940 --> 00:33:24.500
Markert, Kel (MSFC-ST11)[UAH]
The other question in the chat, yeah, oh thank you.
00:33:24.550 --> 00:33:31.370
Markert, Kel (MSFC-ST11)[UAH]
Yeah, question in chat if we have a higher resolution DM can, we use that instead absolutely so.
00:33:32.400 --> 00:33:43.910
Markert, Kel (MSFC-ST11)[UAH]
I just use this data set because it's readily available on Earth engine. If you want to use your DM what you'll need to do is ingest it into Earth engine and you can connect to it directly.
00:33:44.580 --> 00:33:49.520
Markert, Kel (MSFC-ST11)[UAH]
So, in this case what you'll need to do so for example.
00:33:52.730 --> 00:33:56.620
Markert, Kel (MSFC-ST11)[UAH]
I am going to look at this for a second NASA.
00:33:57.890 --> 00:33:58.480
Markert, Kel (MSFC-ST11)[UAH]
Yeah.
00:34:04.830 --> 00:34:19.660
Markert, Kel (MSFC-ST11)[UAH]
So for example, if you want to use your DM I'm just going to call this my DM and then you'll read it in as like the image but instead of like this. NASA DM you'll give it the path to the Dems that you select that you have.
00:34:21.310 --> 00:34:22.220
Markert, Kel (MSFC-ST11)[UAH]
And it should work.
00:34:24.680 --> 00:34:25.150
Markert, Kel (MSFC-ST11)[UAH]
OK.
00:34:26.440 --> 00:34:29.230
Markert, Kel (MSFC-ST11)[UAH]
I am tired of waiting for that to process.
00:34:30.600 --> 00:34:35.730
Markert, Kel (MSFC-ST11)[UAH]
But you can kind of see that lines of the path. So where there's one kind of over here and one over here.
00:34:37.380 --> 00:34:46.930
Markert, Kel (MSFC-ST11)[UAH]
OK, so now we're going to process the the water image and we're just going to apply the edge. Otsu function and we are going to.
00:34:46.980 --> 00:34:48.250
Markert, Kel (MSFC-ST11)[UAH]
To uh?
00:34:49.120 --> 00:34:50.220
Markert, Kel (MSFC-ST11)[UAH]
Create a mosaic.
00:34:52.710 --> 00:34:56.580
Markert, Kel (MSFC-ST11)[UAH]
So this is some crazy funky code going on here.

00:34:58.300 --> 00:35:11.950
Markert, Kel (MSFC-ST11)[UAH]
What this is basically doing is it's taking the the water mass that we're deriving and it's doing some some cleaning so if you're familiar with morphological filters like opening and closing basically you can get.
00:35:12.360 --> 00:35:29.730
Markert, Kel (MSFC-ST11)[UAH]
Yeah, some, like random pixels that are that are there that aren't necessarily water. It's just like a one off pixel and so this opening and closing process kind of like removes those one off pixels and makes this smooth boundary around the water.
00:35:30.640 --> 00:35:31.630
Markert, Kel (MSFC-ST11)[UAH]
That you're extracting.
00:35:33.140 --> 00:35:40.920
Markert, Kel (MSFC-ST11)[UAH]
And then finally what we're doing here is only considering pixels that are less than 15 meters from height above nearest range.
00:35:41.690 --> 00:35:42.420
Markert, Kel (MSFC-ST11)[UAH]
So it's
00:35:43.120 --> 00:35:50.100
Markert, Kel (MSFC-ST11)[UAH]
couple operations packed into one and and I do want to note that we are actively working on kind of.
00:35:51.210 --> 00:35:59.560
Markert, Kel (MSFC-ST11)[UAH]
Uh having these algorithms readily available to users so that way. They don't have to do this crazy code. It can just be like a simple function.
00:36:00.560 --> 00:36:02.650
Markert, Kel (MSFC-ST11)[UAH]
So that's something on the To Do List.
00:36:03.770 --> 00:36:14.430
Markert, Kel (MSFC-ST11)[UAH]
But for now, we can do it manually and and load it so once that's done, we can run this and.
00:36:16.140 --> 00:36:22.200
Markert, Kel (MSFC-ST11)[UAH]
Bam get her water image and you see here how it's kind of like smoothed out on the edges.
00:36:23.700 --> 00:36:25.900
Markert, Kel (MSFC-ST11)[UAH]
And there's like small like it.
00:36:26.620 --> 00:36:28.710
Markert, Kel (MSFC-ST11)[UAH]
Should remove some of the smaller ones but?
00:36:29.860 --> 00:36:32.140
Markert, Kel (MSFC-ST11)[UAH]
That's what that morphological filtering is doing.
00:36:34.140 --> 00:36:48.480
Markert, Kel (MSFC-ST11)[UAH]
OK, so here we can explore a little bit. There's actually a kind of a cool not cool. Sorry that's kind of insensitive, but there was flooding on the over here in Honduras.
00:36:49.130 --> 00:36:52.790
Markert, Kel (MSFC-ST11)[UAH]
And just kinda wanna show it if it loads up.
00:36:59.960 --> 00:37:02.190
Markert, Kel (MSFC-ST11)[UAH]
Let's say it's over here, we'll see if I can.

00:37:09.740 --> 00:37:11.930
Markert, Kel (MSFC-ST11)[UAH]
Uh will let that load.
00:37:13.350 --> 00:37:15.090
Markert, Kel (MSFC-ST11)[UAH]
But that's just a recap of.
00:37:16.720 --> 00:37:38.520
Markert, Kel (MSFC-ST11)[UAH]
You know processing the the data for the surface water Maps right 'cause. We want to have a surface water map so that way. We can extract floods. I did provide some examples of of code so that way. You can export things, so this example here. You just have to click show code so this will actually export the data to Earth engine.
00:37:39.640 --> 00:37:44.600
Markert, Kel (MSFC-ST11)[UAH]
You have to give it an asset ID and you have to specify that you're exporting to asset.
00:37:46.520 --> 00:37:49.190
Markert, Kel (MSFC-ST11)[UAH]
So that's an example there.
00:37:50.290 --> 00:37:55.040
Markert, Kel (MSFC-ST11)[UAH]
This example here is gonna export to Google Drive.
00:37:55.800 --> 00:37:57.390
Markert, Kel (MSFC-ST11)[UAH]
So I will actually run that.
00:37:58.240 --> 00:37:59.720
Markert, Kel (MSFC-ST11)[UAH]
And UM.
00:38:00.530 --> 00:38:04.930
Markert, Kel (MSFC-ST11)[UAH]
So for this for this water map that we just created we can just go ahead and export.
00:38:05.600 --> 00:38:10.430
Markert, Kel (MSFC-ST11)[UAH]
Uh I'm just going to call this live 'cause I export it once before.
00:38:11.810 --> 00:38:25.960
Markert, Kel (MSFC-ST11)[UAH]
So you you change well actually you don't really have to change anything. I'll just export to your drive so if you run that and then you go and look at you can go to likecode.earthengine.google.com forward slash tasks.
00:38:26.780 --> 00:38:36.200
Markert, Kel (MSFC-ST11)[UAH]
And you can see that you know this. This data set has been submitted to server and it will run in process and hopefully by the end of this training, we can.
00:38:37.080 --> 00:38:37.720
Markert, Kel (MSFC-ST11)[UAH]
Seeing.
00:38:39.550 --> 00:38:41.250
Markert, Kel (MSFC-ST11)[UAH]
Also in this domain scripting.
00:38:42.610 --> 00:38:43.050
Markert, Kel (MSFC-ST11)[UAH]
Alright.
00:38:44.520 --> 00:38:47.240
Markert, Kel (MSFC-ST11)[UAH]
So yeah, so, so if you have your?

00:38:48.300 --> 00:38:49.920
Markert, Kel (MSFC-ST11)[UAH]
If you like the code editor.
00:38:51.210 --> 00:38:59.270
Markert, Kel (MSFC-ST11)[UAH]
You can show here on the right usually it just shows up a console, but you can go to tasks and you can see that that's running as well.
00:39:00.470 --> 00:39:05.990
Markert, Kel (MSFC-ST11)[UAH]
So now it's running on server will let that cook and then come back to it.
00:39:08.040 --> 00:39:11.510
Markert, Kel (MSFC-ST11)[UAH]
Are there any questions on the recap for surface water mapping?
00:39:13.710 --> 00:39:14.800
Markert, Kel (MSFC-ST11)[UAH]
No OK.
00:39:16.440 --> 00:39:19.890
Markert, Kel (MSFC-ST11)[UAH]
So now we're going to focus on extracting Oh yeah, go ahead.
00:39:17.460 --> 00:39:17.960
Cherrington, Emil A. (MSFC-ST11)[UAH]
Take care.
00:39:19.440 --> 00:39:24.940
Cherrington, Emil A. (MSFC-ST11)[UAH]
Can I can I get ask uh kind of retroactive question so going back to the Dem?
00:39:19.940 --> 00:39:21.810
Markert, Kel (MSFC-ST11)[UAH]
Yeah, I guess.
00:39:22.130 --> 00:39:24.020
Markert, Kel (MSFC-ST11)[UAH]
Ask a question.
00:39:25.210 --> 00:39:25.710
Markert, Kel (MSFC-ST11)[UAH]
Every.
00:39:25.570 --> 00:39:28.110
Cherrington, Emil A. (MSFC-ST11)[UAH]
Question from Estefana.
00:39:27.630 --> 00:39:28.000
Markert, Kel (MSFC-ST11)[UAH]
Yeah.
00:39:29.010 --> 00:39:36.990
Cherrington, Emil A. (MSFC-ST11)[UAH]
Uhm any so, so you're using in A. The default DM or what have you. The SRTM from from Google Earth engine?
00:39:37.790 --> 00:40:03.100
Cherrington, Emil A. (MSFC-ST11)[UAH]
Uh do you have any experience with you know like you you're using the SRTM but you think another one is better or something like that. I guess just sit. You know since you developed Hydra floods and all this good stuff do you have kind of tricks of the trade suggestions for? What might help with you know making something a wee bit better and also regarding the that you know question about higher res DM.
00:40:03.710 --> 00:40:10.390
Cherrington, Emil A. (MSFC-ST11)[UAH]
Uh like for instance, in Guatemala. I think that they have a a 20 meter DM that's from Ortho photos, etc.
00:40:10.450 --> 00:40:32.770
Cherrington, Emil A. (MSFC-ST11)[UAH]

Yeah is there a point where you think having a super high res DM might be overkill. Like and then I think we still have the participant here from from El Salvador. They have if I'm not mistaken like a one meter liter based DM for the whole country and so you know would uh would something that detailed be necessary or you think SRTM is is good enough.
00:40:34.800 --> 00:40:38.770
Markert, Kel (MSFC-ST11)[UAH]
Yeah, that's that's a really good question, I mean, all thanks so for.
00:40:40.540 --> 00:40:49.700
Markert, Kel (MSFC-ST11)[UAH]
So for the example of doing the train corrections and you know, I don't necessarily think having a higher resolution Dems.
00:40:50.400 --> 00:40:52.780
Markert, Kel (MSFC-ST11)[UAH]
Really affect sings.
00:40:54.080 --> 00:40:56.740
Markert, Kel (MSFC-ST11)[UAH]
Or or for the hand for that matter.
00:40:58.280 --> 00:41:28.730
Markert, Kel (MSFC-ST11)[UAH]
Uhm I typically use the The Merit Dems because this is a hydrologically conditioned Dems. What that means is they looked at flow paths and and the landscape of things and they kind of like fix some errors within the Dems to make it more like if you drop a you know theoretically if you drop of water at this pixel will actually flow to water kind of thing and represent the reality so that's why I like that, particularly because Hydra floods is you know with water.
00:41:29.010 --> 00:41:31.160
Markert, Kel (MSFC-ST11)[UAH]
Uh and especially the hand.
00:41:32.300 --> 00:41:46.160
Markert, Kel (MSFC-ST11)[UAH]
I will say to your question, though, even though it may not necessarily matter at this point with high resolution information doing like the train flattening and the masking out high elevations later on will do.
00:41:47.260 --> 00:41:47.970
Markert, Kel (MSFC-ST11)[UAH]
Uh.
00:41:49.160 --> 00:41:57.290
Markert, Kel (MSFC-ST11)[UAH]
Flood depth estimation and that is where High Resolution D very accurate. DMS will provide much more accurate results.
00:41:58.000 --> 00:41:59.410
Markert, Kel (MSFC-ST11)[UAH]
So if you have light art.
00:42:00.140 --> 00:42:05.020
Markert, Kel (MSFC-ST11)[UAH]
And you want to estimate flood depth definitely use Lidar for for the flood depth estimation.
00:42:05.760 --> 00:42:21.940
Markert, Kel (MSFC-ST11)[UAH]
And in this case, we use global DMS just because that's more readily available. I know so if you click on here. You'll get this. This paper, which is the implementation of the flood water depth estimation tool.
00:42:22.820 --> 00:42:26.750
Markert, Kel (MSFC-ST11)[UAH]
Uh they they tested it and if I can find it.
00:42:29.960 --> 00:42:49.220
Markert, Kel (MSFC-ST11)[UAH]
Uh yeah, so they tested it using light art here in the US and compared it against a hydrodynamic model. So it's really

developed for high resolution DM. It's kind of used for the more coarse resolution Dems. But if you have high resolution DM use it for the flood water depth estimation.
00:42:49.970 --> 00:42:52.170
Markert, Kel (MSFC-ST11)[UAH]
Uhm but it May.
00:42:53.500 --> 00:43:02.690
Markert, Kel (MSFC-ST11)[UAH]
You know, I don't I don't think it will make too much of you can definitely use it. But I don't think it will make much of a difference if you use it for the terrain flattening?
00:43:02.940 --> 00:43:11.350
Markert, Kel (MSFC-ST11)[UAH]
Would it would it slow it down for the train flattening higher much higher location. Yeah, the question was will slow it down for the train flattening.
00:43:13.520 --> 00:43:15.870
Markert, Kel (MSFC-ST11)[UAH]
Short answer is probably not.
00:43:17.570 --> 00:43:22.030
Markert, Kel (MSFC-ST11)[UAH]
The the reason for that being is because when you're using Earth engine.
00:43:22.710 --> 00:43:40.100
Markert, Kel (MSFC-ST11)[UAH]
You're all of your computations are for what you really want at the end is like to export. These data and at that point you specify scale to process and So what Earth engine does is basically takes all the imagery at different resolutions and Maps it to that scale.
00:43:41.350 --> 00:43:55.060
Markert, Kel (MSFC-ST11)[UAH]
So it will it it's basically just using the lower resolution information. But if you have so going back to the flood water depth estimation tool even though you may export it at say 30 meters.
00:43:55.900 --> 00:44:06.850
Markert, Kel (MSFC-ST11)[UAH]
By you, having really good information at the lower sorry at the higher resolutions. It means you're 30 meter estimates are going to be much better.
00:44:07.240 --> 00:44:08.880
Markert, Kel (MSFC-ST11)[UAH]
OK, OK.
00:44:11.450 --> 00:44:14.250
Cherrington, Emil A. (MSFC-ST11)[UAH]
And then one just one follow on question on that one kill.
00:44:12.920 --> 00:44:14.760
Markert, Kel (MSFC-ST11)[UAH]
One just one more question on that.
00:44:14.960 --> 00:44:15.260
Markert, Kel (MSFC-ST11)[UAH]
Yeah.
00:44:15.170 --> 00:44:22.170
Cherrington, Emil A. (MSFC-ST11)[UAH]
So so is it the DM that we're using in in this for all of the Central America analysis or the SRTM.
00:44:16.720 --> 00:44:18.220
Markert, Kel (MSFC-ST11)[UAH]
So so there.
00:44:19.340 --> 00:44:20.470
Markert, Kel (MSFC-ST11)[UAH]
In whisper.

00:44:21.520 --> 00:44:23.110
Markert, Kel (MSFC-ST11)[UAH]
Yeah, yeah.
00:44:25.140 --> 00:44:27.680
Markert, Kel (MSFC-ST11)[UAH]
Sorry repeat the the last part is it.
00:44:28.270 --> 00:44:34.440
Cherrington, Emil A. (MSFC-ST11)[UAH]
As for the analysis are we using merit or SRTM for the Central America analysis.
00:44:28.350 --> 00:44:29.630
Markert, Kel (MSFC-ST11)[UAH]
Sir it's yeah just.
00:44:36.010 --> 00:44:37.530
Markert, Kel (MSFC-ST11)[UAH]
We're using merit at this point.
00:44:38.060 --> 00:44:40.290
Cherrington, Emil A. (MSFC-ST11)[UAH]
OK and then that's in Earth engine.
00:44:39.050 --> 00:44:39.990
Markert, Kel (MSFC-ST11)[UAH]
Yeah, and.
00:44:42.170 --> 00:44:43.150
Markert, Kel (MSFC-ST11)[UAH]
Yes, that is.
00:44:43.040 --> 00:44:44.670
Cherrington, Emil A. (MSFC-ST11)[UAH]
OK, perfect thanks GAIL.
00:44:46.280 --> 00:44:46.590
Markert, Kel (MSFC-ST11)[UAH]
Yep.
00:44:48.990 --> 00:44:49.560
Markert, Kel (MSFC-ST11)[UAH]
OK.
00:44:52.750 --> 00:44:56.520
Markert, Kel (MSFC-ST11)[UAH]
Anyways so OK, cool, yeah, those are great questions.
00:44:57.090 --> 00:44:57.760
Markert, Kel (MSFC-ST11)[UAH]
Uhm.
00:44:58.760 --> 00:44:59.460
Markert, Kel (MSFC-ST11)[UAH]
So.
00:45:00.540 --> 00:45:08.830
Markert, Kel (MSFC-ST11)[UAH]
Now we're going to move on to extracting floods and we're going to use it for like different sing with permanent water to speed things up actually exported this data.
00:45:10.740 --> 00:45:20.010
Markert, Kel (MSFC-ST11)[UAH]
So I that's why I have this code here actually export it for you. Hopefully, I I set the permissions to be open so hopefully we won't have an issue.
00:45:21.880 --> 00:45:29.590
Markert, Kel (MSFC-ST11)[UAH]
But some yeah, this will really speed things up so that way. We're not waiting like this case for data process.

00:45:30.730 --> 00:45:39.890
Markert, Kel (MSFC-ST11)[UAH]
OK, so if you can just read that in basically what we're doing is we're extracting out the the SAR data and then we restricting out the water layer.
00:45:40.960 --> 00:45:41.550
Markert, Kel (MSFC-ST11)[UAH]
Uhm.
00:45:42.540 --> 00:45:49.970
Markert, Kel (MSFC-ST11)[UAH]
OK so in this first case remember, we had 3 cases of kind of using JRC and these cases have been.
00:45:50.020 --> 00:45:53.470
Markert, Kel (MSFC-ST11)[UAH]
Uhm uhm coded into Hydra floods.
00:45:54.270 --> 00:45:58.270
Markert, Kel (MSFC-ST11)[UAH]
And so the first case that we're going to go over is using this yearly permanent water.
00:45:59.620 --> 00:46:15.740
Markert, Kel (MSFC-ST11)[UAH]
Uh and so Hydra floods has this function called extract flood and it's just doing that differencing process that we talked about so it's comparing a reference data set and it's comparing your observation and extracting out what is the difference?
00:46:16.340 --> 00:46:24.780
Markert, Kel (MSFC-ST11)[UAH]
And in this case you know, we specify what the references and it's basically we talked about like yearly in this case.
00:46:25.630 --> 00:46:32.630
Markert, Kel (MSFC-ST11)[UAH]
Uhm there's there's a small little gotcha in this so it's looking at the previous 5 years.
00:46:33.740 --> 00:46:42.380
Markert, Kel (MSFC-ST11)[UAH]
Of of yearly data so it's saying if it's been if it's being classified as permanent within the past 5 years we will consider that as permanent.
00:46:42.890 --> 00:46:44.760
Markert, Kel (MSFC-ST11)[UAH]
Uhm that.
00:46:45.680 --> 00:46:54.680
Markert, Kel (MSFC-ST11)[UAH]
Maybe not that well that is. Maybe not the best, because you know if you have a big event can have changes in the in the channel but.
00:46:55.680 --> 00:46:57.880
Markert, Kel (MSFC-ST11)[UAH]
That's currently how we have it coded up.
00:46:58.840 --> 00:47:06.250
Markert, Kel (MSFC-ST11)[UAH]
And so you can run that and you'll get your floods for that. Yearly data and then we can run it and as you see it loads much faster.
00:47:06.840 --> 00:47:07.450
Markert, Kel (MSFC-ST11)[UAH]
Uhm.
00:47:08.180 --> 00:47:37.410
Markert, Kel (MSFC-ST11)[UAH]
Was it did it load for everybody? Yeah, OK cool so that means it is public good so you can. Sorry I should assume it again? So you can see here where like blue is that is the water that we detected from earlier and then the red area is just the difference between that water and what is permanent and so you can see here and kind of zoom around that you know it's extracting out there's a good amount of flooding to on this day.

00:47:38.070 --> 00:47:39.060
Markert, Kel (MSFC-ST11)[UAH]
Uh in this region.
00:47:41.430 --> 00:47:42.020
Markert, Kel (MSFC-ST11)[UAH]
So.
00:47:43.010 --> 00:47:49.880
Markert, Kel (MSFC-ST11)[UAH]
I also wanted to show this guy this guy kind of struck me it seemed like it was just a lot of flooding.
00:47:51.080 --> 00:47:55.040
Markert, Kel (MSFC-ST11)[UAH]
So uhm OK, so that is our first case.
00:47:56.750 --> 00:48:10.680
Markert, Kel (MSFC-ST11)[UAH]
I do want to note with this example, 2, so you'll notice this kind of weird effect going on down here right where it's saying that you know red in this case as floods, but it's saying it's flooded in the ocean.
00:48:12.990 --> 00:48:22.520
Markert, Kel (MSFC-ST11)[UAH]
Which is kind of funny but what's happening here is the JRC data set only is buffered out? I think 5 kilometres or something from shorelines?
00:48:23.640 --> 00:48:31.940
Markert, Kel (MSFC-ST11)[UAH]
From significant islands, I should say because you could see here that there's no buffer out here so.
00:48:32.810 --> 00:48:38.580
Markert, Kel (MSFC-ST11)[UAH]
You know just be aware of that this does happen and so.
00:48:39.700 --> 00:48:40.950
Markert, Kel (MSFC-ST11)[UAH]
Yeah, and maybe.
00:48:42.100 --> 00:48:55.330
Markert, Kel (MSFC-ST11)[UAH]
Something simple to where you just try and paint in what's going on out in our oceans. But it is doing what it's expected to do. It's just shared she doesn't have any data out here and so it just considers it floods.
00:48:56.420 --> 00:48:57.550
Markert, Kel (MSFC-ST11)[UAH]
Uh yeah.
00:48:59.040 --> 00:49:08.380
Markert, Kel (MSFC-ST11)[UAH]
OK, so that's that actually I I. I really like this one to be honest with you. This this algorithm speaking anecdotally.
00:49:09.510 --> 00:49:12.480
Markert, Kel (MSFC-ST11)[UAH]
Because it's not anything.
00:49:13.380 --> 00:49:29.640
Markert, Kel (MSFC-ST11)[UAH]
Like that it's it's pretty smooth results what I mean by smooth is like it's not very noisy. You don't get like a lot of just you will see in the other examples. You'll get some, like kind of grainy along you know the River channels or whatnot.
00:49:30.500 --> 00:49:52.510
Markert, Kel (MSFC-ST11)[UAH]
This is a case here where I was telling you that you know it's probably like exposed sandbar or something and this our data picked it up as as water, but in the JRC data set because it's optical Sarah looks or sorry sand looks bright and optical so it's not going to pick it up there, you can distinguish it easily.

00:49:53.540 --> 00:49:56.050
Markert, Kel (MSFC-ST11)[UAH]
So there are there are some nuances associated with it.
00:49:57.060 --> 00:50:05.560
Markert, Kel (MSFC-ST11)[UAH]
OK, but you know for the most part I. I like this approach and and for the I think I highlighted yes or sorry Monday.
00:50:06.190 --> 00:50:27.620
Markert, Kel (MSFC-ST11)[UAH]
Uh we used Hydra floods to provide data to the World Food Program in a flooding in Cambodia. This is the algorithm that we use the you know look at the past 5 years of of yearly permanent water and difference it from our observations and that's what we provided as flood non flood kind of thing to to the World Food Program.
00:50:30.040 --> 00:50:30.500
Markert, Kel (MSFC-ST11)[UAH]
OK.
00:50:31.880 --> 00:50:54.760
Markert, Kel (MSFC-ST11)[UAH]
The next case that we're going to talk about is the long term occurrence so in this case right so the JRC has monthly observations of water and so from 1985, the president. They just like reduce that down and looked at percentages of observations that were water. That's the occurrence layer and so you can set this option by saying reference equals occurrence.
00:50:55.920 --> 00:51:03.750
Markert, Kel (MSFC-ST11)[UAH]
We also have to give it a permanent water threshold, so to say like anything above this number of observations is permanent water.
00:51:04.540 --> 00:51:08.260
Markert, Kel (MSFC-ST11)[UAH]
Uhm in this case, I think the default is 75.
00:51:09.110 --> 00:51:13.880
Markert, Kel (MSFC-ST11)[UAH]
But you know feel free to play around with it, so it it's zero to 100.
00:51:14.940 --> 00:51:24.320
Markert, Kel (MSFC-ST11)[UAH]
So if you give it I think 100. It's probably going to classify everything as floods or close to everything as floods, but you know play around with it, I think.
00:51:24.980 --> 00:51:32.390
Markert, Kel (MSFC-ST11)[UAH]
Uh 80 looked a little too high so I might do 75.
00:51:34.050 --> 00:51:35.380
Markert, Kel (MSFC-ST11)[UAH]
And UM.
00:51:36.450 --> 00:51:47.330
Markert, Kel (MSFC-ST11)[UAH]
Yeah, you can look at that so it seems like it's not even like picking up. This domain channel here. So you can just play around with the the threshold a little bit, maybe 70.
00:51:50.750 --> 00:51:53.060
Markert, Kel (MSFC-ST11)[UAH]
Still, not picking up that main channel geez.
00:51:54.280 --> 00:51:55.870
Markert, Kel (MSFC-ST11)[UAH]
Maybe 50.
00:51:58.120 --> 00:52:00.640
Markert, Kel (MSFC-ST11)[UAH]
50 is a 2 year term period.

00:52:06.640 --> 00:52:16.850
Markert, Kel (MSFC-ST11)[UAH]
Yeah, so you can see how you can play around the threshold. And it gives you a little bit different results. I was just looking for a small area. You know you probably want to look at.
00:52:18.280 --> 00:52:19.190
Markert, Kel (MSFC-ST11)[UAH]
Somewhere else.
00:52:21.060 --> 00:52:23.450
Markert, Kel (MSFC-ST11)[UAH]
To say what's flooded versus what's not flooded.
00:52:24.870 --> 00:52:31.740
Markert, Kel (MSFC-ST11)[UAH]
Uhm OK and again so this is looking at the whole record right so it's in by.
00:52:32.770 --> 00:52:34.150
Markert, Kel (MSFC-ST11)[UAH]
I have any thoughts on like.
00:52:35.040 --> 00:52:36.830
Markert, Kel (MSFC-ST11)[UAH]
Pros or cons of that.
00:52:38.520 --> 00:52:46.410
Markert, Kel (MSFC-ST11)[UAH]
Like should we be looking at the whole record. How long is the whole record from 1985 to present so almost 40 years.
00:52:49.340 --> 00:52:50.250
Markert, Kel (MSFC-ST11)[UAH]
Right yeah.
00:52:50.300 --> 00:53:02.920
Markert, Kel (MSFC-ST11)[UAH]
Merging things change, yeah, well reference change overtime like changed course and stuff, depending on yeah, and then and then reservoirs could be built and other things, so yeah, I mean?
00:53:03.920 --> 00:53:04.970
Markert, Kel (MSFC-ST11)[UAH]
Uh this.
00:53:06.300 --> 00:53:12.070
Markert, Kel (MSFC-ST11)[UAH]
This is an option, but you know, depending on your use case it may not be the best option.
00:53:13.110 --> 00:53:31.420
Markert, Kel (MSFC-ST11)[UAH]
So again the permanent threshold is that meaning 50, so if you set it at 50. That means if 50% of the is it percentage or what does it mean again? Yeah, so the question is what? What what exactly is this permanent threshold then like units or what does it mean?
00:53:32.630 --> 00:53:54.970
Markert, Kel (MSFC-ST11)[UAH]
So for example, a so the JRC datasets like an occurrence right like percent of time that it's been observed observed as water so a 100 means 100% of the time it's water and so like 50 would mean like 50% of the out of all the observations, we've had. We've observed 50% of the time is being water.
00:53:55.240 --> 00:53:55.600
Markert, Kel (MSFC-ST11)[UAH]
OK.
00:53:57.770 --> 00:54:10.120
Markert, Kel (MSFC-ST11)[UAH]
They actually like makes me think of another thing because then by think of a problem with that. Think of like how they so JRC is derived from optical data and I see like a problem with that.

00:54:11.460 --> 00:54:14.340
Markert, Kel (MSFC-ST11)[UAH]
Lesson like the winter, when it's like raining.
00:54:15.230 --> 00:54:21.450
Markert, Kel (MSFC-ST11)[UAH]
They would have less observations. Yeah, that's exactly right alma, so that she hurt her answer was.
00:54:21.500 --> 00:54:25.790
Markert, Kel (MSFC-ST11)[UAH]
As uh when it whenever it's a rainy you'll have less observations.
00:54:26.510 --> 00:54:29.780
Markert, Kel (MSFC-ST11)[UAH]
And so you're you're you can misspeak flooding.
00:54:30.700 --> 00:54:41.270
Markert, Kel (MSFC-ST11)[UAH]
Uh you can miss a lot of data because there's a clouds and so it may not be the the best option for like a persistently cloud cover area like I think.
00:54:42.580 --> 00:54:50.090
Markert, Kel (MSFC-ST11)[UAH]
Bottom Allah has quite a bit of clouds throughout the year right or or a meal went how what was the clearest.
00:54:50.370 --> 00:54:55.210
Markert, Kel (MSFC-ST11)[UAH]
Uh Landsat image of bullies or something wasn't it like only 5%.
00:54:55.970 --> 00:54:56.560
Markert, Kel (MSFC-ST11)[UAH]
Cloudy.
00:54:57.550 --> 00:55:02.400
Markert, Kel (MSFC-ST11)[UAH]
Never was like a purely clear, Landsat image that are right.
00:55:05.520 --> 00:55:06.480
Markert, Kel (MSFC-ST11)[UAH]
Maybe he stepped away.
00:55:07.890 --> 00:55:08.270
Markert, Kel (MSFC-ST11)[UAH]
OK.
00:55:09.130 --> 00:55:20.380
Markert, Kel (MSFC-ST11)[UAH]
So again like, this is a really good data set but I I think you know you should really consider like? What are you trying to do and some of the nuances associated with the data sets?
00:55:22.850 --> 00:55:30.920
Markert, Kel (MSFC-ST11)[UAH]
OK, the last thing we're going to talk about for comparing to permanent water is the seasonal information.
00:55:32.120 --> 00:55:42.760
Markert, Kel (MSFC-ST11)[UAH]
So again what the seasonal information is doing is it's kind of like the occurrence, but it's only for a particular month right so in this case.
00:55:43.940 --> 00:56:08.730
Markert, Kel (MSFC-ST11)[UAH]
Uh what we're doing here, you can say references seasonal and we also have to provide a threshold because it's looking at occurrence within that month, so again 100 would mean that that 100% of the observations have been classified as water and so in this case. Let's say 80 maybe 75, I don't know you played around threshold.
00:56:10.430 --> 00:56:21.850
Markert, Kel (MSFC-ST11)[UAH]
And specify a month or is it. Yep, Yep that's a very good question. And the question was Do you have to specify a month the answer is?

00:56:22.670 --> 00:56:23.280
Markert, Kel (MSFC-ST11)[UAH]
Yes, and no.
00:56:24.230 --> 00:56:30.620
Markert, Kel (MSFC-ST11)[UAH]
So what it's doing is it's extracting out the month, the date information from the image.
00:56:31.300 --> 00:56:40.180
Markert, Kel (MSFC-ST11)[UAH]
OK, OK, so you just have to make sure that emit the observation image that you're providing that you want to compare against.
00:56:40.890 --> 00:56:49.300
Markert, Kel (MSFC-ST11)[UAH]
Is like has that date property and that date property in in earth engine? Is system colon time underscore start?
00:56:50.700 --> 00:56:55.360
Markert, Kel (MSFC-ST11)[UAH]
So I'm actually I could show you that let me see how bleak.
00:57:01.770 --> 00:57:04.620
Markert, Kel (MSFC-ST11)[UAH]
Don't mind all my crazy stuff.
00:57:06.450 --> 00:57:07.340
Markert, Kel (MSFC-ST11)[UAH]
Over the place.
00:57:10.360 --> 00:57:13.300
Markert, Kel (MSFC-ST11)[UAH]
Yep, so here you'll see like it has a start date property.
00:57:14.150 --> 00:57:14.580
Markert, Kel (MSFC-ST11)[UAH]
OK.
00:57:15.900 --> 00:57:29.090
Markert, Kel (MSFC-ST11)[UAH]
And I think if you like edit, it, you gonna edit it here, but usually if you're doing Hydra floods processing. It will carry all that information. The only time it will lose a date is when you do a reduction.
00:57:30.590 --> 00:57:41.360
Markert, Kel (MSFC-ST11)[UAH]
So each each each image has its own metadata and the way Hydra floods is setup will carry all that metadata, but then once you do a reduction it just loses it.
00:57:41.790 --> 00:57:42.110
Markert, Kel (MSFC-ST11)[UAH]
OK.
00:57:44.020 --> 00:57:50.260
Markert, Kel (MSFC-ST11)[UAH]
And just for reference. Our our water image that we've processed earlier exported in 19 minutes so.
00:57:51.490 --> 00:57:52.200
Markert, Kel (MSFC-ST11)[UAH]
It's pretty good.
00:57:53.450 --> 00:57:58.270
Markert, Kel (MSFC-ST11)[UAH]
That's doing the train flattening speckled filtering water mapping so.
00:57:59.820 --> 00:58:00.310
Markert, Kel (MSFC-ST11)[UAH]
Nice.
00:58:03.580 --> 00:58:07.290
Markert, Kel (MSFC-ST11)[UAH]
OK, any other questions on the seasonal flooding.

00:58:11.760 --> 00:58:21.330
Markert, Kel (MSFC-ST11)[UAH]
Again, you can play around the threshold, and kind of see 70. You looked like it didn't. It still didn't get that Channel, now, it's looking a little better, but still.
00:58:22.140 --> 00:58:28.900
Markert, Kel (MSFC-ST11)[UAH]
See what I mean by like the yearly kind of looks the best you know you don't get this kind of stuff along the channel anyways.
00:58:30.020 --> 00:58:34.360
Markert, Kel (MSFC-ST11)[UAH]
OK, the last thing is just comparing the different approaches so.
00:58:35.310 --> 00:58:36.200
Estéfana Velásquez (CENAOS) (Invitado)
I have a question.
00:58:36.230 --> 00:58:36.960
Markert, Kel (MSFC-ST11)[UAH]
I have a question.
00:58:38.120 --> 00:58:39.310
Markert, Kel (MSFC-ST11)[UAH]
Uh yeah, please go ahead.
00:58:38.440 --> 00:58:38.810
Estéfana Velásquez (CENAOS) (Invitado)
Alright.
00:58:40.390 --> 00:59:09.890
Estéfana Velásquez (CENAOS) (Invitado)
Yeah, I just hope that you didn't say this already, but I I don't think I heard it and in the part of the code that it sets for other using early permanent water for this case, we will use previous 5 years. But I don't know in which and what part do we choose what we compare these previous 5 years to their wrist the most recent image or where do I set the date to?
00:59:09.970 --> 00:59:11.560
Estéfana Velásquez (CENAOS) (Invitado)
To do this conversation.
00:59:15.000 --> 00:59:17.250
Markert, Kel (MSFC-ST11)[UAH]
Yeah, thank you. That's a really good question.
00:59:17.990 --> 00:59:22.480
Markert, Kel (MSFC-ST11)[UAH]
So the the date information is being extracted from the image.
00:59:24.430 --> 00:59:27.320
Markert, Kel (MSFC-ST11)[UAH]
So so maybe I could do this.
00:59:29.710 --> 00:59:32.730
Markert, Kel (MSFC-ST11)[UAH]
Water score image dot.
00:59:33.420 --> 00:59:36.230
Markert, Kel (MSFC-ST11)[UAH]
Date dot get info.
00:59:37.740 --> 00:59:38.320
Markert, Kel (MSFC-ST11)[UAH]
Earth.
00:59:41.050 --> 00:59:41.670
Markert, Kel (MSFC-ST11)[UAH]
4.

00:59:42.900 --> 00:59:43.240
Markert, Kel (MSFC-ST11)[UAH]
Matt.
00:59:49.040 --> 00:59:52.490
Markert, Kel (MSFC-ST11)[UAH]
OK so it has this date property.
00:59:53.840 --> 00:59:57.840
Markert, Kel (MSFC-ST11)[UAH]
In reality, like the metadata like I was mentioning is is system time start.
00:59:58.530 --> 01:00:04.840
Markert, Kel (MSFC-ST11)[UAH]
Uh so you can extract that out, and basically it's looking at this and saying like this is our stop date.
01:00:06.140 --> 01:00:21.680
Markert, Kel (MSFC-ST11)[UAH]
Anything after this do not consider because we don't know right and so, so from 2020. So it will count 20202019201820172016. Those are the 5 years that it will look back at.
01:00:24.710 --> 01:00:33.770
Markert, Kel (MSFC-ST11)[UAH]
Yeah, yeah, it does change depending on what date so you don't have to explicitly set it. The only thing you have to do is make sure your image has a date as date information.
01:00:34.760 --> 01:00:35.930
Markert, Kel (MSFC-ST11)[UAH]
Did that answer your question?
01:00:36.140 --> 01:00:38.520
Estéfana Velásquez (CENAOS) (Invitado)
But if if uh.
01:00:39.820 --> 01:00:59.080
Estéfana Velásquez (CENAOS) (Invitado)
If I wanted to to compare it with like a some extreme events. Some fast floating. I don't know. Maybe I'm just brainstorming, but baby. I can choose which years I want to compare it with or just the previous 5 year.
01:00:52.300 --> 01:00:52.680
Markert, Kel (MSFC-ST11)[UAH]
Yeah.
01:01:01.090 --> 01:01:29.120
Markert, Kel (MSFC-ST11)[UAH]
Yeah, so using this particular one. It's just going to give you the 5 years. Maybe so you can compare to other extreme events. You'll just have will go through an example here in a second actually that that will give you like an an example of how to do that, so and and maybe maybe I can ask you what, if there was a year that was a particularly extreme event and we can go through that example will that help.
01:01:30.490 --> 01:01:31.790
Estéfana Velásquez (CENAOS) (Invitado)
Yeah, it's very much please.
01:01:32.690 --> 01:01:33.090
Markert, Kel (MSFC-ST11)[UAH]
OK.
01:01:35.030 --> 01:02:04.840
Markert, Kel (MSFC-ST11)[UAH]
I was at EarthLink gym that you could manually change the date so she could she do that, if she wanted just change the date manually and then that way or not? That's right. No, not necessary. So the question was could she change the date manually within Earth engine, not necessarily because that date is tide to that observation. What if I understood correctly what she's wanting to do is compare that observation with another yeah, yeah, yeah, so let's let's move on actually and then we'll we'll get to that example. Sorry.

01:02:05.020 --> 01:02:09.710
Markert, Kel (MSFC-ST11)[UAH]
Last thing I wanted to show is you know this is just comparison of the different examples.
01:02:10.500 --> 01:02:12.050
Markert, Kel (MSFC-ST11)[UAH]
So you just kind of toggle on and off.
01:02:12.110 --> 01:02:15.710
Markert, Kel (MSFC-ST11)[UAH]
Love you know what's different OK.
01:02:17.660 --> 01:02:34.560
Markert, Kel (MSFC-ST11)[UAH]
So I think this is the the example that you're that you're referencing too will go through this example quickly and and then we can go back and we'll change. I'll ask you what date was it was another event and then we can kind of compare.
01:02:35.710 --> 01:03:05.600
Markert, Kel (MSFC-ST11)[UAH]
So, in this case, we're going to do a preemptive pre and post differencing so in this case. We're going to do the classification difference sing and the change detection process. So here we have our pre event. And in this case. I was focusing on hurricane at an iota and so basically. I they hit sometime in late October. So to be safe. I just we're grabbing all the imagery for September, the month prior.
01:03:05.960 --> 01:03:09.640
Markert, Kel (MSFC-ST11)[UAH]
And we're going to create a reference image from that so.
01:03:10.030 --> 01:03:18.020
Markert, Kel (MSFC-ST11)[UAH]
And again this is processing the all the 5 countries. So Belize, Guatemala and Nicaragua El Salvador and Honduras.
01:03:19.310 --> 01:03:32.440
Markert, Kel (MSFC-ST11)[UAH]
So we're just doing the same process where we do. The train flattening. We're doing the filtering and then we're reducing it down to a mean so basically it's taking all the pixels so for individual pixel. Whatever observation there was we're just taking the mean value of that.
01:03:33.440 --> 01:03:36.320
Markert, Kel (MSFC-ST11)[UAH]
Uh so pretty pretty straightforward.
01:03:36.540 --> 01:03:38.250
Markert, Kel (MSFC-ST11)[UAH]
Come come composite.
01:03:39.570 --> 01:03:51.660
Markert, Kel (MSFC-ST11)[UAH]
And the last thing we're going to do is we're going to create a pre image. So, in this case. We're going to segment out the areas that are water from this from September.
01:03:53.080 --> 01:04:17.070
Markert, Kel (MSFC-ST11)[UAH]
And then this is the This is the function that you will want to use if you want to compare your image to a particular other event or a pre image. It's it's called discrete difference and So what it takes this is the observation image. So our water image was from the hurricane. Edit Iota event and then our reference image is that pre pre event.
01:04:17.680 --> 01:04:33.030
Markert, Kel (MSFC-ST11)[UAH]
And so we can just run that and get our basically it's doing actually the extract floods. What I'll showing earlier with JRC. It actually uses this same function within it to do that difference.
01:04:35.400 --> 01:04:41.900
Markert, Kel (MSFC-ST11)[UAH]
The only the only difference sorry for the multiple uses of the word difference? The only.

01:04:43.390 --> 01:04:49.290
Markert, Kel (MSFC-ST11)[UAH]
A distinguishing factor between this function and the extract floods up here.
01:04:50.120 --> 01:04:57.190
Markert, Kel (MSFC-ST11)[UAH]
Uh is that this extract floods just grabs the JRC information for you and then runs that discrete difference.
01:05:00.910 --> 01:05:02.240
Markert, Kel (MSFC-ST11)[UAH]
OK, UM.
01:05:03.060 --> 01:05:09.180
Markert, Kel (MSFC-ST11)[UAH]
While that's running this actually might take a while because this is processing a whole month of data.
01:05:10.220 --> 01:05:10.790
Markert, Kel (MSFC-ST11)[UAH]
Uhm.
01:05:11.760 --> 01:05:23.610
Markert, Kel (MSFC-ST11)[UAH]
So does someone want to give me a another event just give me like a month or a week or something to where there was a pretty that we want to compare to.
01:05:26.530 --> 01:05:30.190
Markert, Kel (MSFC-ST11)[UAH]
Our our our friends from Central America do you have one?
01:05:30.120 --> 01:05:41.990
Estéfana Velásquez (CENAOS) (Invitado)
Yeah, here here can meet we compare it since wears the same. But for Honduras was almost the same areas that were affected.
01:05:36.420 --> 01:05:37.530
Markert, Kel (MSFC-ST11)[UAH]
Practicing.
01:05:43.980 --> 01:05:54.070
Estéfana Velásquez (CENAOS) (Invitado)
So he wants number, previewing September also September 98 and the post is October 19th.
01:05:44.310 --> 01:05:45.250
Markert, Kel (MSFC-ST11)[UAH]
OK, so.
01:05:56.240 --> 01:06:00.870
Markert, Kel (MSFC-ST11)[UAH]
OK, so let's do this because our data doesn't go back that far.
01:05:57.280 --> 01:05:57.600
Estéfana Velásquez (CENAOS) (Invitado)
Yeah.
01:06:00.920 --> 01:06:01.160
Markert, Kel (MSFC-ST11)[UAH]
Right.
01:06:02.060 --> 01:06:07.210
Markert, Kel (MSFC-ST11)[UAH]
We're gonna do, I'm actually going to create some new code for you.
01:06:09.620 --> 01:06:14.450
Markert, Kel (MSFC-ST11)[UAH]
And we're going to pull the Lance. We're going to pull the Landsat Series for doing that so.
01:06:14.890 --> 01:06:16.820
Estéfana Velásquez (CENAOS) (Invitado)
Or maybe we can do like that.

01:06:15.800 --> 01:06:17.110
Markert, Kel (MSFC-ST11)[UAH]
Or maybe we could do it.
01:06:18.290 --> 01:06:22.540
Estéfana Velásquez (CENAOS) (Invitado)
You know, so there was a real problem last year or so.
01:06:18.340 --> 01:06:18.830
Markert, Kel (MSFC-ST11)[UAH]
Money.
01:06:20.090 --> 01:06:20.710
Markert, Kel (MSFC-ST11)[UAH]
Class.
01:06:21.490 --> 01:06:22.720
Markert, Kel (MSFC-ST11)[UAH]
Roll it back.
01:06:25.750 --> 01:06:27.110
Markert, Kel (MSFC-ST11)[UAH]
OK, what are the dates for that.
01:06:31.570 --> 01:06:32.340
Estéfana Velásquez (CENAOS) (Invitado)
Provided.
01:06:34.180 --> 01:06:36.280
Guillermo Adriel Renderos Mejía
Which event are you looking for?
01:06:39.320 --> 01:06:40.170
Markert, Kel (MSFC-ST11)[UAH]
Uh.
01:06:41.730 --> 01:06:43.780
Markert, Kel (MSFC-ST11)[UAH]
That's fine, let's do let's do Hurricane Mitch.
01:06:48.040 --> 01:06:52.750
Markert, Kel (MSFC-ST11)[UAH]
Sorry I muted myself? What are the dates that you said 1998 September?
01:07:00.510 --> 01:07:01.320
Markert, Kel (MSFC-ST11)[UAH]
Through October.
01:07:07.290 --> 01:07:09.060
Markert, Kel (MSFC-ST11)[UAH]
Was that Landsat 5 reliance?
01:07:09.370 --> 01:07:11.320
Markert, Kel (MSFC-ST11)[UAH]
The meal was Landsat 7, up at that point.
01:07:17.240 --> 01:07:18.210
Markert, Kel (MSFC-ST11)[UAH]
Is it millstone?
01:07:26.670 --> 01:07:29.540
Markert, Kel (MSFC-ST11)[UAH]
OK, so I think it's Lance Athletic. Good thing we have that in here.
01:07:31.760 --> 01:07:37.330
Markert, Kel (MSFC-ST11)[UAH]
OK, so we'll do Lt 5 is Lance at 5:00.
01:07:38.080 --> 01:07:39.380
Markert, Kel (MSFC-ST11)[UAH]
And we are going to do.

01:07:39.430 --> 01:07:42.360
Markert, Kel (MSFC-ST11)[UAH]
UNDWI equals.
01:07:45.420 --> 01:07:45.830
Markert, Kel (MSFC-ST11)[UAH]
Hi.
01:07:52.280 --> 01:07:53.410
Markert, Kel (MSFC-ST11)[UAH]
And that and that.
01:07:54.600 --> 01:07:55.210
Markert, Kel (MSFC-ST11)[UAH]
Uh.
01:08:16.640 --> 01:08:17.790
Markert, Kel (MSFC-ST11)[UAH]
Feel like it's very quiet.
01:08:29.500 --> 01:08:29.960
Markert, Kel (MSFC-ST11)[UAH]
But.
01:08:34.690 --> 01:08:39.360
Markert, Kel (MSFC-ST11)[UAH]
K what that run Earth engine capacity exceeded nice.
01:08:40.460 --> 01:08:43.630
Markert, Kel (MSFC-ST11)[UAH]
OK let's see if we can run the hurricane Mitch example.
01:08:46.670 --> 01:08:47.840
Markert, Kel (MSFC-ST11)[UAH]
Uh.
01:08:57.240 --> 01:09:02.490
Markert, Kel (MSFC-ST11)[UAH]
Set call this floods, Mitch difference, or water image from.
01:09:03.400 --> 01:09:08.630
Markert, Kel (MSFC-ST11)[UAH]
We're gonna do Mitch water, and we're going to have to reduce that down to mode.
01:09:11.050 --> 01:09:11.820
Markert, Kel (MSFC-ST11)[UAH]
Master mode.
01:09:14.270 --> 01:09:15.660
Markert, Kel (MSFC-ST11)[UAH]
Ann.
01:09:19.450 --> 01:09:20.940
Markert, Kel (MSFC-ST11)[UAH]
Let's see if we can do this.
01:09:26.080 --> 01:09:27.390
Markert, Kel (MSFC-ST11)[UAH]
5. Dot.
01:09:34.780 --> 01:09:35.870
Markert, Kel (MSFC-ST11)[UAH]
Hope this works.
01:09:38.330 --> 01:09:39.680
Markert, Kel (MSFC-ST11)[UAH]
Live coding is never.
01:09:41.300 --> 01:09:41.670
Markert, Kel (MSFC-ST11)[UAH]
Right.

01:09:51.980 --> 01:09:54.140
Markert, Kel (MSFC-ST11)[UAH]
So this match.
01:10:13.460 --> 01:10:14.030
Markert, Kel (MSFC-ST11)[UAH]
K.
01:10:18.010 --> 01:10:19.300
Markert, Kel (MSFC-ST11)[UAH]
In our errors, so far.
01:10:20.780 --> 01:10:23.570
Markert, Kel (MSFC-ST11)[UAH]
Ah whoa.
01:10:24.400 --> 01:10:25.170
Markert, Kel (MSFC-ST11)[UAH]
It works.
01:10:25.320 --> 01:10:26.180
Markert, Kel (MSFC-ST11)[UAH]
First, try.
01:10:28.440 --> 01:10:29.270
Markert, Kel (MSFC-ST11)[UAH]
Alright.
01:10:33.750 --> 01:10:35.340
Markert, Kel (MSFC-ST11)[UAH]
Oh, oh, I messed up.
01:10:35.640 --> 01:10:38.160
Markert, Kel (MSFC-ST11)[UAH]
Ah, it worked technically.
01:10:40.410 --> 01:10:52.220
Markert, Kel (MSFC-ST11)[UAH]
Uh we remember him in DWI higher values mean water and so this edge. Otsu threshold is our automatically does like less than so we just need to invert it.
01:10:55.440 --> 01:10:56.740
Markert, Kel (MSFC-ST11)[UAH]
But it's close very close.
01:10:59.650 --> 01:11:00.760
Markert, Kel (MSFC-ST11)[UAH]
Uh OK.
01:11:05.040 --> 01:11:18.640
Markert, Kel (MSFC-ST11)[UAH]
So this looks like the Mitch example, so this isn't probably the best example that you see, there's a lot of clouds and shadows well that's really bad.
01:11:19.740 --> 01:11:20.350
Markert, Kel (MSFC-ST11)[UAH]
So.
01:11:22.300 --> 01:11:27.430
Markert, Kel (MSFC-ST11)[UAH]
Uh you know for example, like up here we can probably compare let's see.
01:11:28.830 --> 01:11:30.200
Markert, Kel (MSFC-ST11)[UAH]
There's still a lot of clouds.
01:11:36.850 --> 01:11:40.360
Markert, Kel (MSFC-ST11)[UAH]
But there's some good amount of flooding going on here, so let's see.

01:11:43.380 --> 01:11:45.100
Markert, Kel (MSFC-ST11)[UAH]
It's not too crazy, I mean, it's not.
01:11:47.380 --> 01:11:51.800
Markert, Kel (MSFC-ST11)[UAH]
I mean, comparing the 2 it wasn't like Hurricane EDA Iota case was.
01:11:52.770 --> 01:11:53.920
Markert, Kel (MSFC-ST11)[UAH]
That much larger.
01:11:56.660 --> 01:12:01.490
Markert, Kel (MSFC-ST11)[UAH]
So did that help answer your question by the way I'm just kind of going on and.
01:12:02.290 --> 01:12:03.890
Estéfana Velásquez (CENAOS) (Invitado)
Yes, yes, thank you.
01:12:02.530 --> 01:12:28.450
Markert, Kel (MSFC-ST11)[UAH]
Coding being interested, so, so theoretically you can't do this right with this discrete difference. You can say like. Hey, like I want to compare it to another event or I want to compare it to a pre prevents or like a dry period, or something and have it work and I wish this actually ran. It's kind of funny that there Hurricane Mitch example, ran but this didn't.
01:12:30.520 --> 01:13:00.850
Markert, Kel (MSFC-ST11)[UAH]
Oh, cool, it works, sometimes sometimes if it doesn't work, the first time you may be just got to like rerun, it again because Earth engine on the back end caches results so sometimes if it doesn't run first time it's like it'll get halfway there, and then you'll say try again. It will already start from halfway so at least in the hurricane at an iota case right so here's our pre event. We should we saw this in the slides right. Here's our pre event. Here's our post event and then we can just.
01:13:00.910 --> 01:13:10.910
Markert, Kel (MSFC-ST11)[UAH]
Extract out was actually floods and I do want to mention that you know just process a whole months worth of data over all these.
01:13:12.430 --> 01:13:12.840
Markert, Kel (MSFC-ST11)[UAH]
So.
01:13:14.760 --> 01:13:18.060
Markert, Kel (MSFC-ST11)[UAH]
It's pretty I mean, earthly I'm still like sometimes I just.
01:13:18.840 --> 01:13:20.890
Markert, Kel (MSFC-ST11)[UAH]
I'm baffled by how much earth engine does.
01:13:22.550 --> 01:13:30.080
Markert, Kel (MSFC-ST11)[UAH]
Uhm and it looks kind of fuzzy because we're not doing that aggregation right. It's it's actually like giving like if you zoom in it's.
01:13:30.700 --> 01:13:37.580
Markert, Kel (MSFC-ST11)[UAH]
It's legitimate results, but it kind of looks fuzzy because of that special filter and how earth engine works. So it's just kind of like a?
01:13:38.310 --> 01:13:38.920
Markert, Kel (MSFC-ST11)[UAH]
A thing.

01:13:41.660 --> 01:13:42.170
Markert, Kel (MSFC-ST11)[UAH]
Thanks.
01:13:43.950 --> 01:13:52.520
Markert, Kel (MSFC-ST11)[UAH]
So, there, you go that's how you do different seeing doing a pre and post moving on so we did. Hurricane Mitch I'll leave that in there as an example.
01:13:53.230 --> 01:14:11.640
Markert, Kel (MSFC-ST11)[UAH]
Uh so moving on so that was looking at you know classified Maps right looking at just like chat like you know where where we said it was before where we said it was now and kind of just the difference and in this case. We're going to do change detection, so this is that log rhythmic amplitude ratio process.
01:14:12.420 --> 01:14:13.540
Markert, Kel (MSFC-ST11)[UAH]
Uh so.
01:14:14.360 --> 01:14:15.140
Markert, Kel (MSFC-ST11)[UAH]
You're familiar.
01:14:16.120 --> 01:14:27.920
Markert, Kel (MSFC-ST11)[UAH]
No this isn't water depth. This is the change detection for a flooding event. So we're looking at we're looking at the actual values of a pre and post event and seeing what that change in change in backscatter values are.
01:14:28.770 --> 01:14:31.560
Markert, Kel (MSFC-ST11)[UAH]
Uhm and you'll see it actually provides a pretty nice.
01:14:33.610 --> 01:14:37.040
Markert, Kel (MSFC-ST11)[UAH]
A flood map and you don't like anyways.
01:14:38.330 --> 01:14:41.600
Markert, Kel (MSFC-ST11)[UAH]
So to do this, it needs to be an amplitude.
01:14:41.790 --> 01:14:46.560
Markert, Kel (MSFC-ST11)[UAH]
Uhm units so SAR data is because of?
01:14:47.750 --> 01:15:11.530
Markert, Kel (MSFC-ST11)[UAH]
The nature of how it works. What is typically done as you take the log rhythmic but the log base 10 of the data and then that's the that's the signal in decibels right and so to do any like actual processing. It should theoretically be in this amplitude, which is the raw values and so we need to convert and So what we're seeing up here is actually the the decibels.
01:15:12.450 --> 01:15:13.040
Markert, Kel (MSFC-ST11)[UAH]
Uhm.
01:15:13.700 --> 01:15:19.570
Markert, Kel (MSFC-ST11)[UAH]
And so to do any processing will convert it to the power or also known as amplitude.
01:15:20.590 --> 01:15:41.160
Markert, Kel (MSFC-ST11)[UAH]
And so Hydra floods has a a function to do that. It's called DB DB to power and so you'll convert your data your post image to amplitude and then you'll divide your pre image and amplitude and then you'll take the log base 10 of those, and that's your log rhythmic amplitude ratio.
01:15:42.250 --> 01:15:42.830
Markert, Kel (MSFC-ST11)[UAH]
Uhm.

01:15:43.530 --> 01:15:50.730
Markert, Kel (MSFC-ST11)[UAH]
I will say that we should probably code this up into a function to make it nice and simple for users so we can do this.
01:15:51.150 --> 01:15:56.290
Markert, Kel (MSFC-ST11)[UAH]
Uh quite easily so in this case you'll see that by taking.
01:15:56.390 --> 01:16:10.000
Markert, Kel (MSFC-ST11)[UAH]
Uh log amplitude ratio will just get like a change map right so it will be an L essentially be an intensity of change, so from that intensity of change then we can use that and start.
01:16:11.540 --> 01:16:17.440
Markert, Kel (MSFC-ST11)[UAH]
We can just use our thresholding algorithm and say what intensity of change was actually floods.
01:16:18.500 --> 01:16:31.970
Markert, Kel (MSFC-ST11)[UAH]
So that's what we're doing here again. This is as before because this our data has a lot of the fund special, and other things going on. We're just cleaning up the data set and then we can map it.
01:16:39.420 --> 01:16:40.310
Markert, Kel (MSFC-ST11)[UAH]
Any questions.
01:16:42.310 --> 01:16:43.690
Markert, Kel (MSFC-ST11)[UAH]
While we're waiting for this to run.
01:16:55.630 --> 01:16:56.090
Markert, Kel (MSFC-ST11)[UAH]
OK.
01:17:00.290 --> 01:17:03.460
Markert, Kel (MSFC-ST11)[UAH]
So you can see here it's kind of stuck on this water mapping part.
01:17:05.080 --> 01:17:06.810
Markert, Kel (MSFC-ST11)[UAH]
So I'll just give it a bit.
01:17:20.310 --> 01:17:25.390
Markert, Kel (MSFC-ST11)[UAH]
I need to look at why it's like not picking up these clouds all the time for clients at 5:00.
01:17:41.870 --> 01:17:43.290
Markert, Kel (MSFC-ST11)[UAH]
Do do do do.
01:17:43.340 --> 01:17:43.610
Markert, Kel (MSFC-ST11)[UAH]
You know.
01:17:44.890 --> 01:17:45.400
Markert, Kel (MSFC-ST11)[UAH]
Uhm.
01:17:46.970 --> 01:17:51.610
Markert, Kel (MSFC-ST11)[UAH]
Did did did anybody else run the export process that we went through?
01:17:52.800 --> 01:17:55.370
Markert, Kel (MSFC-ST11)[UAH]
Reminder in 12 minutes, 12 minutes.
01:17:55.560 --> 01:17:56.070
Markert, Kel (MSFC-ST11)[UAH]
You beat me.

01:17:56.130 --> 01:17:57.850
Markert, Kel (MSFC-ST11)[UAH]
Hey man,
01:18:02.180 --> 01:18:15.550
Markert, Kel (MSFC-ST11)[UAH]
yeah, well cool, so uhm well. That's actually going we can actually look at that so if I go to my drive? What I'd call it hydro fluid something don't mind all this junk with.
01:18:17.380 --> 01:18:19.230
Markert, Kel (MSFC-ST11)[UAH]
Uh sure.
01:18:29.720 --> 01:18:30.570
Markert, Kel (MSFC-ST11)[UAH]
To refresh.
01:18:31.290 --> 01:18:34.170
Markert, Kel (MSFC-ST11)[UAH]
So the question is chat OK, thank you.
01:18:41.670 --> 01:18:43.740
Markert, Kel (MSFC-ST11)[UAH]
Alright question on the chat.
01:18:46.620 --> 01:18:57.070
Markert, Kel (MSFC-ST11)[UAH]
Is that fast code example is going to be available for the shared drive and I'll solve it? Are Mitch was very extreme case that we want to compare to yes, so I have saved this.
01:18:58.010 --> 01:18:58.620
Markert, Kel (MSFC-ST11)[UAH]
Uhm.
01:19:00.150 --> 01:19:06.180
Markert, Kel (MSFC-ST11)[UAH]
And I think if you maybe not. Now, if you're if you're following along but afterwards.
01:19:06.600 --> 01:19:11.880
Markert, Kel (MSFC-ST11)[UAH]
Uh if you want to refresh that that example should show up.
01:19:14.230 --> 01:19:19.380
Markert, Kel (MSFC-ST11)[UAH]
Uh and if it doesn't I think you have Betsy and ameles.
01:19:19.600 --> 01:19:21.560
Markert, Kel (MSFC-ST11)[UAH]
Uh contact information.
01:19:22.210 --> 01:19:28.000
Markert, Kel (MSFC-ST11)[UAH]
If if that doesn't show up then we can work with you know reach out and we can work with you and.
01:19:28.060 --> 01:19:28.450
Markert, Kel (MSFC-ST11)[UAH]
Yeah.
01:19:29.250 --> 01:19:29.810
Markert, Kel (MSFC-ST11)[UAH]
Uh.
01:19:30.550 --> 01:19:33.620
Markert, Kel (MSFC-ST11)[UAH]
Provide an example, maybe that's what I should do.
01:19:33.670 --> 01:19:39.560
Markert, Kel (MSFC-ST11)[UAH]
You know while we're waiting care. I'm going to actually write down my contact information.

01:19:48.550 --> 01:19:49.660
Markert, Kel (MSFC-ST11)[UAH]
Yeah, I'll put it in the chat too.
01:19:54.550 --> 01:20:02.340
Markert, Kel (MSFC-ST11)[UAH]
Yeah, so if you have any questions on Hydra floods or anything, you know feel free to to reach out here.
01:20:03.740 --> 01:20:05.660
Markert, Kel (MSFC-ST11)[UAH]
I'm also going to put this in the chat.
01:20:09.090 --> 01:20:12.920
Markert, Kel (MSFC-ST11)[UAH]
So we can happy to work with you and and.
01:20:13.780 --> 01:20:15.690
Markert, Kel (MSFC-ST11)[UAH]
Get your examples on things.
01:20:17.260 --> 01:20:19.390
Markert, Kel (MSFC-ST11)[UAH]
I've been feeling this is going to be a case where.
01:20:20.500 --> 01:20:24.970
Markert, Kel (MSFC-ST11)[UAH]
Doesn't run or you're just going to have to run it again and it will go?
01:20:26.100 --> 01:20:31.200
Markert, Kel (MSFC-ST11)[UAH]
Maybe because, like Earth engines likewise everybody processing for Central America.
01:20:31.510 --> 01:20:33.800
Markert, Kel (MSFC-ST11)[UAH]
Well, we exactly yeah.
01:20:36.490 --> 01:20:39.400
Markert, Kel (MSFC-ST11)[UAH]
OK, any other questions.
01:20:53.040 --> 01:20:53.930
Markert, Kel (MSFC-ST11)[UAH]
Ocean.
01:20:54.830 --> 01:20:55.220
Markert, Kel (MSFC-ST11)[UAH]
OK.
01:20:56.050 --> 01:20:57.370
Markert, Kel (MSFC-ST11)[UAH]
On the map where you have like?
01:20:57.600 --> 01:21:00.010
Markert, Kel (MSFC-ST11)[UAH]
Eventually demonstrates 'cause he did like a whole month.
01:21:01.910 --> 01:21:07.140
Markert, Kel (MSFC-ST11)[UAH]
So so there are different times right so are they so they and they overlap and stuff, so.
01:21:07.180 --> 01:21:07.430
Markert, Kel (MSFC-ST11)[UAH]
So.
01:21:08.100 --> 01:21:20.060
Markert, Kel (MSFC-ST11)[UAH]
So, like there's some old ones in 7 days, even in terms of yeah, so basically the question is how do you account for the differences in times and observations? Yeah, so that's the whole like there's A?

01:21:21.180 --> 01:21:25.040
Markert, Kel (MSFC-ST11)[UAH]
People basically spend their entire careers trying to answer that question.
01:21:25.090 --> 01:21:25.750
Markert, Kel (MSFC-ST11)[UAH]
OK.
01:21:26.520 --> 01:21:27.190
Markert, Kel (MSFC-ST11)[UAH]
Uhm.
01:21:28.190 --> 01:21:32.100
Markert, Kel (MSFC-ST11)[UAH]
So, in in the remote sensing world, that's called compositing.
01:21:32.930 --> 01:21:51.400
Markert, Kel (MSFC-ST11)[UAH]
And it's a very, very simple way to do it is just take the meaning of the observations, so in this case. It's a month and you assume that in a month. There's not going to be a massive amount of change unless there's a event like a hurricane or flooding or something like that right, but theoretically by taking some.
01:21:52.040 --> 01:21:54.550
Markert, Kel (MSFC-ST11)[UAH]
You know statistic it should.
01:21:56.380 --> 01:22:10.970
Markert, Kel (MSFC-ST11)[UAH]
In less it was a really huge event. It shouldn't really affect things right so depending on how you want to do it. I mean, they're like literally people spend their entire field doing compositing so that's why I was like Oh, we're just taking the mean and yeah.
01:22:13.000 --> 01:22:20.650
Markert, Kel (MSFC-ST11)[UAH]
And actually that that brings up a good point that you made so moving back up here along this.
01:22:21.590 --> 01:22:22.170
Markert, Kel (MSFC-ST11)[UAH]
Uhm.
01:22:23.950 --> 01:22:41.400
Markert, Kel (MSFC-ST11)[UAH]
So if you notice that there are like there's some swaths going from bottom from yeah, bottom right to top left and then bottom left to top right. Those are actually 2 different orbit path so that's a sending and descending orbits.
01:22:42.290 --> 01:22:48.320
Markert, Kel (MSFC-ST11)[UAH]
Within SAR because the data is so inherently linked to the viewing angle.
01:22:49.370 --> 01:22:55.870
Markert, Kel (MSFC-ST11)[UAH]
You actually shouldn't be a calculating statistics on ascending versus descending.
01:22:56.960 --> 01:23:10.650
Markert, Kel (MSFC-ST11)[UAH]
If you're going to be calculating in doing so I didn't know know technically but for the sake of if you were doing a scientific analysis, you should not composite ascending and descending SAR, yeah, because because?
01:23:10.720 --> 01:23:30.280
Markert, Kel (MSFC-ST11)[UAH]
Uh yes sort sort of flies. I forget which way to set a one goes but sort it. Its side looking right so as a as a satellites flying across it's looking down this way right so if you're if you're going from bottom left to top right. We're looking down this way right you're seeing one side of the landscape.
01:23:31.530 --> 01:23:45.550
Markert, Kel (MSFC-ST11)[UAH]
Versus if you're coming this way, and going down. You're seeing the other side right and because Sarah is based on geometry 's your in your compositing it ends up just being nonsense, but for this case.

01:23:45.600 --> 01:23:45.800
Markert, Kel (MSFC-ST11)[UAH]
Yes.
01:23:47.020 --> 01:23:55.460
Markert, Kel (MSFC-ST11)[UAH]
Yeah, it's more of a proof of concept, but and and I do want to say that, like really Hydra floods has.
01:23:58.120 --> 01:24:04.680
Markert, Kel (MSFC-ST11)[UAH]
So on this note, so we do have differentiation between ascending and descending so you can do Hydra floods.
01:24:04.910 --> 01:24:14.800
Markert, Kel (MSFC-ST11)[UAH]
Uhm ACS that for a sending and hydro floods does for descending and so just for fun.
01:24:16.170 --> 01:24:24.600
Markert, Kel (MSFC-ST11)[UAH]
Uh I'll let that run and then you can kind of see that it's only gonna be a Sydney is from bottom right to top left.
01:24:26.850 --> 01:24:28.960
Markert, Kel (MSFC-ST11)[UAH]
While that's running will actually look at this.
01:24:29.020 --> 01:24:31.000
Markert, Kel (MSFC-ST11)[UAH]
Uh change detection.
01:24:31.770 --> 01:24:38.450
Markert, Kel (MSFC-ST11)[UAH]
So we have our prevent post event and we have our log amplitude ratio.
01:24:39.730 --> 01:24:56.030
Markert, Kel (MSFC-ST11)[UAH]
And so as I mentioned log amplitude ratio is kind of like an intensity of change and so in this case what we're doing at the end right as we did a thresholding algorithm and so you can threshold it and then you can see where those changes were.
01:24:59.970 --> 01:25:03.650
Markert, Kel (MSFC-ST11)[UAH]
And and just note like sometimes you will get like.
01:25:07.070 --> 01:25:10.680
Markert, Kel (MSFC-ST11)[UAH]
Yeah, so that's why I tried to clean it up.
01:25:12.110 --> 01:25:12.740
Markert, Kel (MSFC-ST11)[UAH]
What was that?
01:25:13.700 --> 01:25:15.570
Markert, Kel (MSFC-ST11)[UAH]
Well, maybe there is a signal I don't know.
01:25:16.880 --> 01:25:17.490
Markert, Kel (MSFC-ST11)[UAH]
So.
01:25:19.440 --> 01:25:25.060
Markert, Kel (MSFC-ST11)[UAH]
But what I what I what what I wanted to show it. This is the log amplitude ratio is.
01:25:26.260 --> 01:25:28.540
Markert, Kel (MSFC-ST11)[UAH]
Like you don't have to worry about the.
01:25:29.660 --> 01:25:31.860
Markert, Kel (MSFC-ST11)[UAH]
The thing you have to worry about is defining.

01:25:33.180 --> 01:26:03.060
Markert, Kel (MSFC-ST11)[UAH]
What is your pre and post but because you're comparing sardis? Are you don't have to worry about like if it was a sandbar or if it was an airport or something like that right because in both images. You're going to see dark as airport right and so even though it even though it's looks as dark and we may extract it as water on its own if we're taking the difference. There will be no difference right so and though in those cases, it's actually better to use the log.
01:26:03.230 --> 01:26:08.700
Markert, Kel (MSFC-ST11)[UAH]
2 ratio, but with that comes some nuances on what do you consider to be?
01:26:09.740 --> 01:26:15.330
Markert, Kel (MSFC-ST11)[UAH]
Yeah, what do you what do you consider to be your reference right so if you if you take a dry period?
01:26:16.200 --> 01:26:17.590
Markert, Kel (MSFC-ST11)[UAH]
You know of a man.
01:26:18.240 --> 01:26:40.900
Markert, Kel (MSFC-ST11)[UAH]
So for example, in Southeast Asia. There's a very distinct dry season and a very distinct wet season and so, if you take those 2 differences. You know you could possibly just be picking up the the natural changes in the seasons like vegetation changes or anything like that, and and so, if you can get something, as close as possible to the actual event that's probably best.
01:26:42.140 --> 01:26:44.830
Markert, Kel (MSFC-ST11)[UAH]
In this case, we only did a month prior right.
01:26:46.980 --> 01:26:48.470
Markert, Kel (MSFC-ST11)[UAH]
And this did not run yet.
01:26:49.840 --> 01:26:52.760
Markert, Kel (MSFC-ST11)[UAH]
I'm going to come back to that in a bit, just for the sake of time.
01:26:52.820 --> 01:26:53.340
Markert, Kel (MSFC-ST11)[UAH]
Uhm.
01:26:54.290 --> 01:27:07.520
Markert, Kel (MSFC-ST11)[UAH]
For the difference a sending descending thing, but moving on at the end. So are there any questions on the the log amplitude ratio or the change detection for SAR?
01:27:23.020 --> 01:27:24.490
Markert, Kel (MSFC-ST11)[UAH]
OK, I'm not seeing any.
01:27:24.550 --> 01:27:41.530
Markert, Kel (MSFC-ST11)[UAH]
Yeah, questions, but I do want to mention to. I need to look at literature and see but I know there's change detection for optical imagery too. It's just this log amplitude ratio is pretty famous for SAR so wanted to highlight that.
01:27:43.380 --> 01:27:52.060
Markert, Kel (MSFC-ST11)[UAH]
OK, the last thing I wanted to mention here is this flood depth estimation again. This is using this flood water depth estimation tool.
01:27:52.740 --> 01:27:53.350
Markert, Kel (MSFC-ST11)[UAH]
Uhm.
01:27:54.860 --> 01:27:57.380
Markert, Kel (MSFC-ST11)[UAH]
It's encapsulated in one.

01:27:58.010 --> 01:27:58.860
Markert, Kel (MSFC-ST11)[UAH]
Uhm.
01:27:59.820 --> 01:28:03.790
Markert, Kel (MSFC-ST11)[UAH]
One function so there's I don't know.
01:28:05.060 --> 01:28:06.680
Markert, Kel (MSFC-ST11)[UAH]
It's not super exciting, but
01:28:07.500 --> 01:28:19.080
Markert, Kel (MSFC-ST11)[UAH]
uh it gives some pretty exciting results So what you do is you can give it a water image or a flood image. Basically, if you give it a flood image. It's only going to do like the flooded parts.
01:28:19.590 --> 01:28:22.100
Markert, Kel (MSFC-ST11)[UAH]
Uh so just keep that in mind.
01:28:23.250 --> 01:28:32.860
Markert, Kel (MSFC-ST11)[UAH]
And if you do the a full water image. There will be some uncertainties associated with permanent water so you can just run this.
01:28:33.650 --> 01:28:39.320
Markert, Kel (MSFC-ST11)[UAH]
So what do you provide here is that image so we can do flood yearly or we can even do like a water image?
01:28:39.960 --> 01:28:55.080
Markert, Kel (MSFC-ST11)[UAH]
The water image all it basically wants is a binary image so zero, meaning non water. One meaning water and you can provide a DM so again this can be any DM if you have your own Dems. You can as long as it's uploaded on Earth engine.
01:28:56.090 --> 01:29:01.160
Markert, Kel (MSFC-ST11)[UAH]
You can use that in this case, we're just using Hydro.
01:29:02.440 --> 01:29:04.050
Markert, Kel (MSFC-ST11)[UAH]
Sorry merit hydro Dems.
01:29:04.940 --> 01:29:10.090
Markert, Kel (MSFC-ST11)[UAH]
Uh this keyword is really just for visualization.
01:29:11.350 --> 01:29:12.880
Markert, Kel (MSFC-ST11)[UAH]
So what this is doing so I'd.
01:29:13.520 --> 01:29:15.590
Markert, Kel (MSFC-ST11)[UAH]
Uhm again if you notice.
01:29:17.700 --> 01:29:27.630
Markert, Kel (MSFC-ST11)[UAH]
When we zoom out here it gets very fuzzy when we do like neighborhood operations. That's just because Earth engine is doing the neighborhoods at very large scales.
01:29:29.420 --> 01:29:34.230
Markert, Kel (MSFC-ST11)[UAH]
The flood water depth estimation tool is all neighborhood up operations.
01:29:35.330 --> 01:29:39.240
Markert, Kel (MSFC-ST11)[UAH]
So by doing force projection what we're doing is we're just saying like.

01:29:40.230 --> 01:29:52.650
Markert, Kel (MSFC-ST11)[UAH]
Force it to be the projection that we want it to be so that way. It's not giving us that little fuzziness. But in reality. If you export it. It's going to be whatever scale you exported that so this is just for visualization.
01:29:54.100 --> 01:29:58.130
Markert, Kel (MSFC-ST11)[UAH]
Uh did already run this, I did cool so.
01:29:59.920 --> 01:30:00.560
Markert, Kel (MSFC-ST11)[UAH]
Cool.
01:30:02.630 --> 01:30:19.180
Markert, Kel (MSFC-ST11)[UAH]
We turn this off, yeah, so you see here. This is our flood water depth estimation, where and here again. Yellow means lower like lower depth so like around one or so meters less than a meter and then if it was like really dark blue.
01:30:20.530 --> 01:30:26.510
Markert, Kel (MSFC-ST11)[UAH]
It would uh it would be about 5 meters or greater so this is you know not.
01:30:27.120 --> 01:30:30.610
Markert, Kel (MSFC-ST11)[UAH]
It's pretty deep, I mean, this probably like what 33 meters or so.
01:30:32.270 --> 01:30:32.930
Markert, Kel (MSFC-ST11)[UAH]
Uhm.
01:30:35.120 --> 01:30:36.300
Markert, Kel (MSFC-ST11)[UAH]
Yeah, I'm just.
01:30:37.410 --> 01:30:46.710
Markert, Kel (MSFC-ST11)[UAH]
So I mean, take it with a grain of salt. I do want to mention so on the going back tracking to that Dems resolution question you see here that the.
01:30:48.090 --> 01:31:00.600
Markert, Kel (MSFC-ST11)[UAH]
The resolution like if you zoom in quite a bit like Merit Dems is at 90 meter resolution. So really you're only going to get depth set about 90 meter resolution so if you have a one meter resolution.
01:31:01.190 --> 01:31:03.950
Markert, Kel (MSFC-ST11)[UAH]
Uh yeah, yeah, it's going to be better.
01:31:05.100 --> 01:31:08.000
Markert, Kel (MSFC-ST11)[UAH]
Also I do want to Note 2 for this.
01:31:08.550 --> 01:31:09.930
Markert, Kel (MSFC-ST11)[UAH]
Uh algorithm.
01:31:11.150 --> 01:31:17.590
Markert, Kel (MSFC-ST11)[UAH]
If you have so I SRTM kind of gives funky results because.
01:31:18.660 --> 01:31:31.430
Markert, Kel (MSFC-ST11)[UAH]
Like vertical resolution in your DM actually matters to So what I mean by that is like if your DM is integer values where it goes like you know 500 meters 501 meters 502 meters.
01:31:32.620 --> 01:31:54.450
Markert, Kel (MSFC-ST11)[UAH]
You're really only going to get changes in depth at 1:00 meter resolution vertically right and that kind of gives some

funky results and another reason why we're using mayor at this point is because it's it's a It's a gradient like it's a continuous value. It's not just like Bend into one meter depths or Heights.
01:31:55.170 --> 01:32:00.780
Markert, Kel (MSFC-ST11)[UAH]
So you can get a little bit better results. That's just the caveat with the with the approach.
01:32:03.050 --> 01:32:03.680
Markert, Kel (MSFC-ST11)[UAH]
OK.
01:32:05.230 --> 01:32:09.040
Markert, Kel (MSFC-ST11)[UAH]
I'm not going to talk about this static map creation, UM.
01:32:09.900 --> 01:32:21.820
Markert, Kel (MSFC-ST11)[UAH]
This was I was actually in a meeting earlier with our colleagues from develop and they're asking what if we want to just make a static map, which is kind of funny usually people want interactive Maps.
01:32:22.950 --> 01:32:32.760
Markert, Kel (MSFC-ST11)[UAH]
But I I completely understand and so I was trying to do a quick example. 'cause there are tools for that. But I ran out of time so.
01:32:33.490 --> 01:32:44.560
Markert, Kel (MSFC-ST11)[UAH]
Uhm come back later and then we'll just give an example of how to create a static map using Python from these datasets, but at this point.
01:32:47.760 --> 01:32:48.870
Markert, Kel (MSFC-ST11)[UAH]
It's not available.
01:32:49.940 --> 01:32:50.530
Markert, Kel (MSFC-ST11)[UAH]
Due to time.
01:32:52.030 --> 01:32:55.090
Markert, Kel (MSFC-ST11)[UAH]
OK so that's all I had.
01:32:55.720 --> 01:32:58.090
Markert, Kel (MSFC-ST11)[UAH]
Uh maybe this finally finished.
01:32:59.640 --> 01:33:01.790
Markert, Kel (MSFC-ST11)[UAH]
I stopped it OK, I'll I'll run it again.
01:33:03.520 --> 01:33:06.430
Markert, Kel (MSFC-ST11)[UAH]
So that's what we had 4 oh it worked cheese.
01:33:10.130 --> 01:33:11.740
Markert, Kel (MSFC-ST11)[UAH]
OK, so now you notice.
01:33:13.180 --> 01:33:17.010
Markert, Kel (MSFC-ST11)[UAH]
All the swaps are going from bottom right to top left.
01:33:18.190 --> 01:33:22.930
Markert, Kel (MSFC-ST11)[UAH]
That's the technically correct way to do composites with our data.
01:33:24.090 --> 01:33:24.440
Markert, Kel (MSFC-ST11)[UAH]
So.

01:33:26.440 --> 01:33:28.330
Markert, Kel (MSFC-ST11)[UAH]
OK, UM.
01:33:29.190 --> 01:33:32.680
Markert, Kel (MSFC-ST11)[UAH]
Yeah, so that's all I had for today's training.
01:33:33.420 --> 01:33:48.230
Markert, Kel (MSFC-ST11)[UAH]
Next training will be on Friday. I know that's kind of everybody wants to spend their Friday. Evenings learning about floods, but uhm so apologies for the poor timing, but it was really.
01:33:49.170 --> 01:33:58.810
Markert, Kel (MSFC-ST11)[UAH]
The only time we could do it, So what we'll do on Friday is we'll take what we've learned here, so we, we basically went through this whole process of.
01:34:01.450 --> 01:34:14.240
Markert, Kel (MSFC-ST11)[UAH]
Uh of getting data doing the preprocessing doing the surface water mapping and then going in and doing extracting out floods and some derivative products from floods like flood depth.
01:34:15.460 --> 01:34:28.680
Markert, Kel (MSFC-ST11)[UAH]
So on Friday what we're going to do is just wrap that whole thing up into a script and we're going to talk about how to deploy that on say a server and so you can run it continuously or have it running.
01:34:29.120 --> 01:34:32.390
Markert, Kel (MSFC-ST11)[UAH]
Uh for a particular event or something.
01:34:33.180 --> 01:34:33.710
Markert, Kel (MSFC-ST11)[UAH]
Uhm.
01:34:34.960 --> 01:35:04.950
Markert, Kel (MSFC-ST11)[UAH]
If uh if you're interested so I will record doing that on on Friday. But if you're interested in following along it will really help if you have Python installed and Hydra fluids installed on a local installation. We we cannot do the the automatic setup and and runs in in Colab will actually have to write a script and and set something up on your local machine and so.
01:35:05.190 --> 01:35:10.460
Markert, Kel (MSFC-ST11)[UAH]
I posted the link to the installation for Hydra floods, it's very simple.
01:35:11.210 --> 01:35:26.320
Markert, Kel (MSFC-ST11)[UAH]
Uh you know, we basically have installed been installing it for these other notebooks. So if you can if you want to follow along you can get and do that, if not the the session will be recorded into and you can come back and revisit it.
01:35:27.480 --> 01:35:47.460
Markert, Kel (MSFC-ST11)[UAH]
So that's what we will be doing on on Friday and then we'll talk about some examples and maybe some kind of of considerations for running this at scale actually we will definitely be talking about some considerations on running this at scale and will actually be taking what we've learned and kind of like.
01:35:48.220 --> 01:35:55.110
Markert, Kel (MSFC-ST11)[UAH]
Uh doing it a different way that makes it more scalable and a little bit more processing efficient.
01:35:56.460 --> 01:36:00.920
Markert, Kel (MSFC-ST11)[UAH]
OK are there any questions before we call it a day?

01:36:09.600 --> 01:36:13.450
Markert, Kel (MSFC-ST11)[UAH]
I am taking silence as a no questions.
01:36:13.860 --> 01:36:14.720
Markert, Kel (MSFC-ST11)[UAH]
James.
01:36:16.170 --> 01:36:16.540
Markert, Kel (MSFC-ST11)[UAH]
Yeah.
01:36:17.950 --> 01:36:30.500
Markert, Kel (MSFC-ST11)[UAH]
Uhm yeah, so you have my email, UM if you know if there are any questions or you want to follow up on something you know, please. Feel free to email me and we can.
01:36:31.190 --> 01:36:34.920
Markert, Kel (MSFC-ST11)[UAH]
Uh you know help you as best we can.
01:36:34.970 --> 01:36:46.000
Markert, Kel (MSFC-ST11)[UAH]
And I forgot who asks a question about the hurricane. Mitch example, disown wanna try refreshing and seeing if this hurricane. Mitch example shows up.
01:36:50.990 --> 01:37:12.200
Markert, Kel (MSFC-ST11)[UAH]
And granted please. Please don't judge the example. It's kind of rough because I you know it was coded on the fly in like a couple minutes OK. It is in there. Thank you so it will if you're going to do any analysis. I promise it will take some refinement, but you know it. At least shows you how to do it.
01:37:13.170 --> 01:37:23.160
Markert, Kel (MSFC-ST11)[UAH]
So OK well thanks everyone for your attention and time and we will talk on Friday. I hope everyone has a great rest of the day.
01:37:25.680 --> 01:37:27.110
Biplov Bhandari
Thanks GAIL bye bye.
01:37:26.860 --> 01:37:27.960
Markert, Kel (MSFC-ST11)[UAH]
Yeah, like.
01:37:51.610 --> 01:38:16.260
Markert, Kel (MSFC-ST11)[UAH]
Yeah, so for for the recording 6. I'll repeat so the question was when I was talking about scaling what is what do I mean by scaling so right now we've only kind of been processing for you know one event one day. You know for a small kind of area right what I mean by scaling is like.
01:38:17.150 --> 01:38:25.800
Markert, Kel (MSFC-ST11)[UAH]
If we want to do months worth of data processing if we want to do something over the entire continental US kind of processing.
01:38:26.470 --> 01:38:41.190
Markert, Kel (MSFC-ST11)[UAH]
What do we need to do and set up for that right and So what I mean by scaling is like taking taking the the the processing for this one case in like making it like more data larger area more time that's what I mean?
01:38:41.360 --> 01:38:42.960
Markert, Kel (MSFC-ST11)[UAH]
OK, so.
01:38:44.330 --> 01:38:46.040
Markert, Kel (MSFC-ST11)[UAH]
Yeah, good question.

01:38:46.890 --> 01:38:49.950
Markert, Kel (MSFC-ST11)[UAH]
Sorry I kind of get jargon like your friend.
01:38:51.330 --> 01:38:56.800
Markert, Kel (MSFC-ST11)[UAH]
OK, well, I'm going to stop the recording at this point if anybody has any questions.
01:38:59.100 --> 01:39:00.600
Markert, Kel (MSFC-ST11)[UAH]
Yeah, we'll figure out thanks everyone.