Photogeology in Terrain Evaluation (Part – 2)
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Lecture - 14
Photo Interpretations: Coastal and Fluvial Landforms-2

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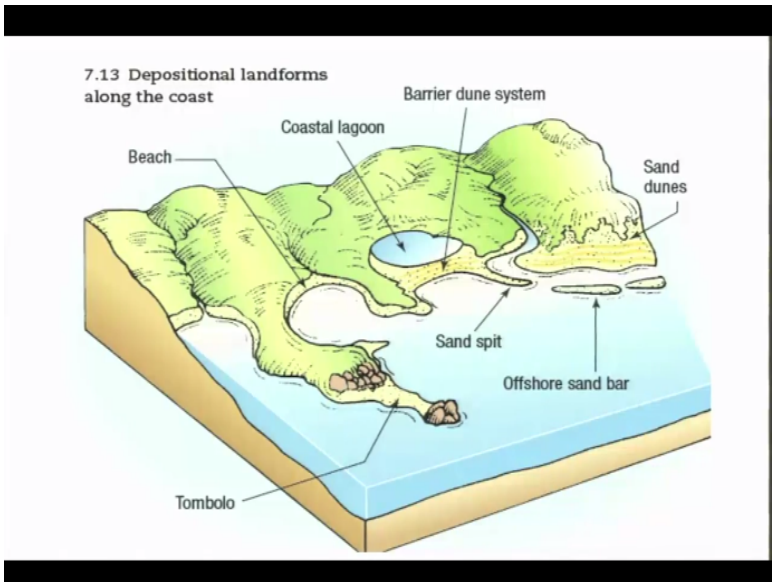

Welcome back, so in the previous lecture, we talked about the different coastal landforms and I hope by now you must have been comfortable in looking at like several cartoons or the sketches which shows that how the different erosional and depositional landforms will look like along the coastline and as I told that the different landforms will depend on or the typical landforms will depend on how the coastal configuration is okay and what is the longshore wave direction and all that okay.

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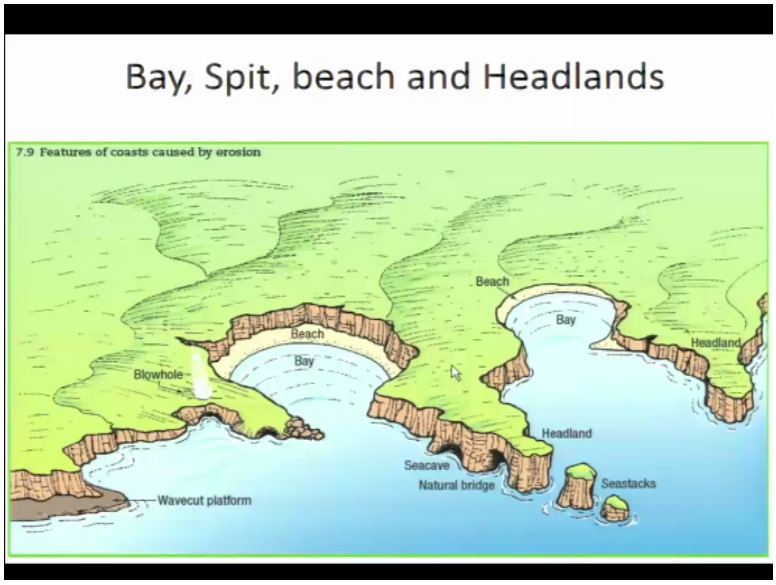

So at the areas you may see beaches okay and the headlands okay, tombolo and all that okay and then of course the marine terraces also.

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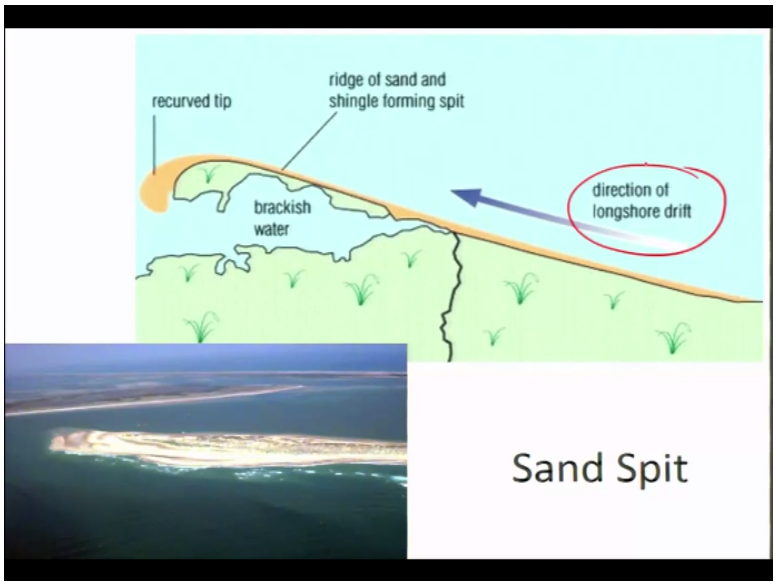

Now this is a typical example of what we were talking about the spit okay and spit is highly dependent on the direction of the longshore waves okay. How it looks like from the space okay?

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This looks like something very typical, so you have a barrier which has been hitting slowly developed okay or building up okay, it will come this will completely get closed and this will become a shot of a lagoon area okay. So this is a typical of spit.

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And another example of the spit at the fringe of the reef okay.

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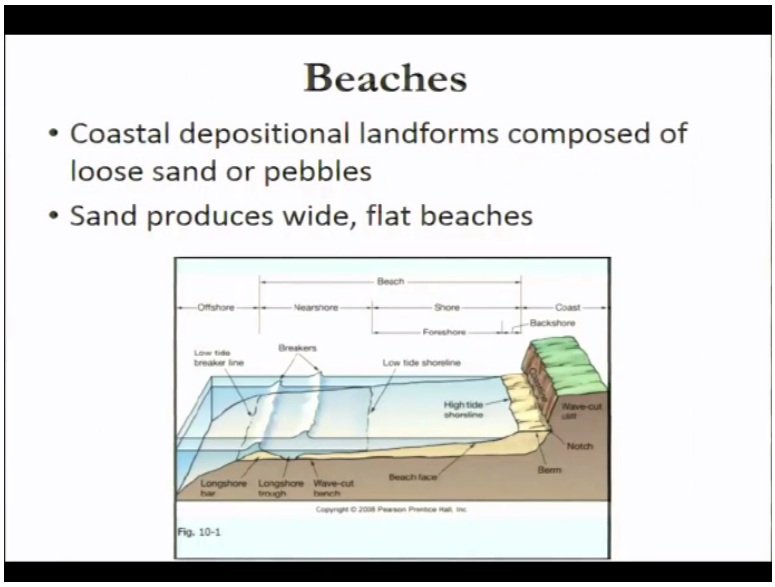

And then coming to the beaches how it looks like okay.

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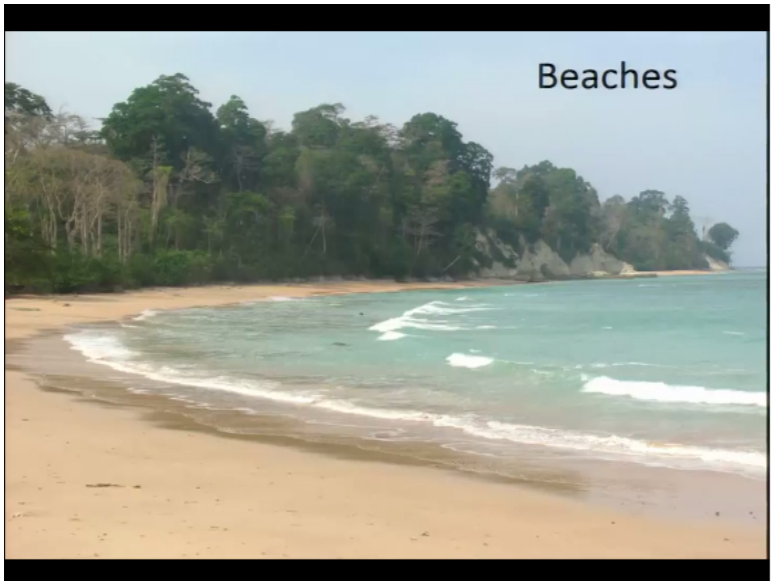

Now this is a typical example of beach as well as the rocky cliffs okay. You are having the cliffs along this from Andaman.

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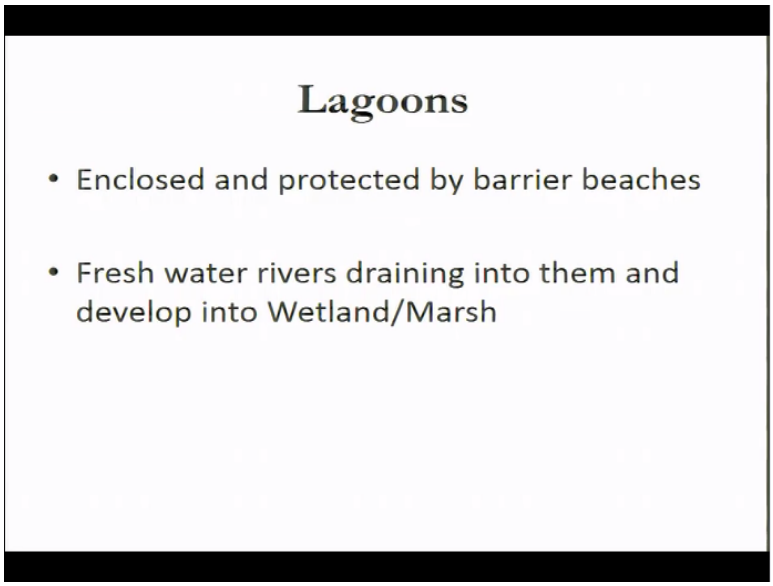

Now coming to the lagoon enclosed and protected by barrier beaches okay. Fresh water river draining into them and develop into sort of a wetland or marsh areas okay.

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So this is slightly away from the beach okay fine. So you have a marshy area or marsh or a wetland which has started developing in this area even have a contribution of the line water or the ocean water at the time of the high tide okay and if you see this side here where my pointer is this is slightly in higher ground okay and if you cross this okay you will go down towards the ocean crossing the beach okay.

So what if I have to draw a section here and what it looks like okay, so you have a beach here, you go up here and then you are having the shallow area. So this is your lagoon and this one is your beach ridge or the longitudinal dune and then you are having the beach and then you get into the ocean here. So this is a typical topography which is keen in some of the location along the coastal regions okay.

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So you will have again the mangroves which are typical also in the coastal regions okay.

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It looks like the tropical mangroves.

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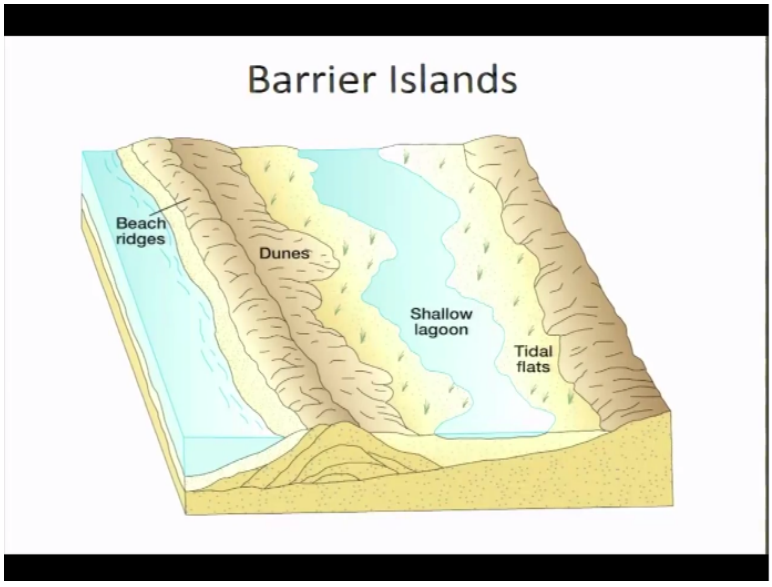

Now beach ridges, shallow lagoon or we can say the wetlands and then tidal flats okay.

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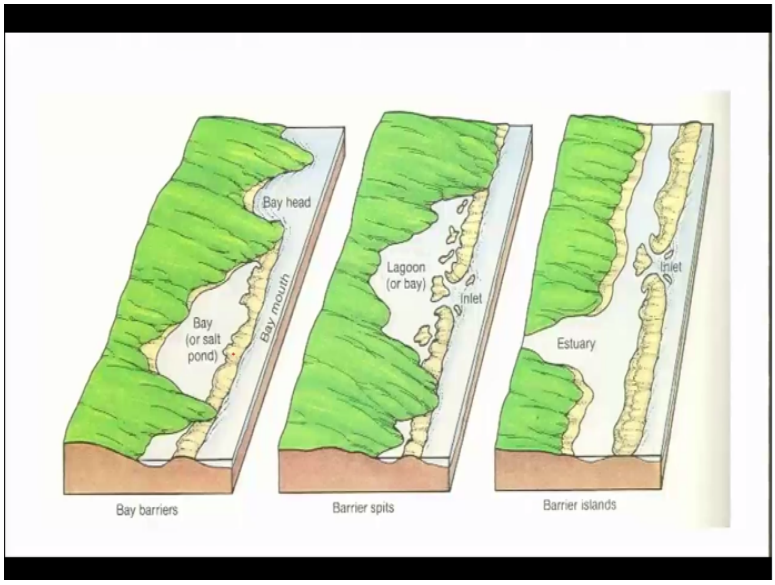

As I told that if you have a spit which is developing maybe the time will come this will close up and then you will have confirmation of the pond or the enclosed lagoonal area or Bay area okay.

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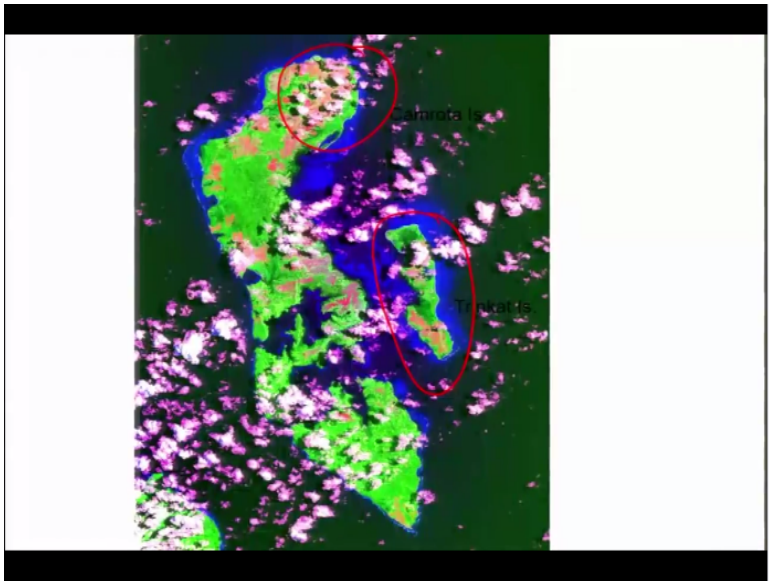

This is an interesting thing which you can use as a typical of photo interpretation. Now this story comes from in the 2004 Sumatra-Andaman earthquake okay. So this is a Landsat data of Trinket Island, of course it is covered with a lot of clouds here but just to show that what exactly happened but this is before the 2004 and then one of the photograph which I was showing was from here the terraces from Andaman okay.

Now this is Camrota and we will see some examples of the photographs from the Trinket Island, what happened during 2004 Sumatra-Andaman earthquake again using the satellite

data okay. This is first whichever I already explained this but I will talk this is from this area this one, this is the Camrota island. So what you see in the next photograph, the photograph which we have taken is from this direction okay. So you can see this portion in that okay.

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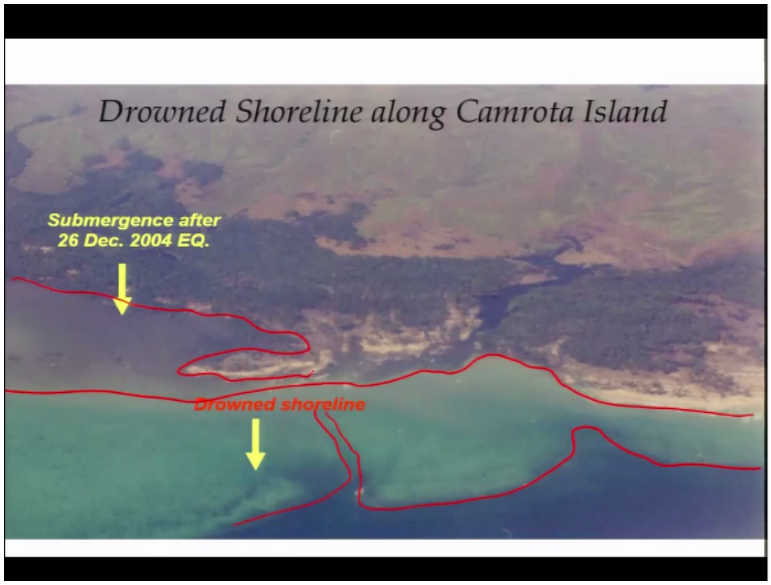

So we have like as I told that we were able to pick up multiple terraces here which also indicate the previous sea level okay. So we have also drowned shorelines along the Camrota Island and even photographs were taken from this side here if we go further this side then we took from here looking like that okay. Clearly you can make out the drowned shorelines okay. If you draw this, you can see this here okay.

So there are channels here, small channels and this is presently a shoreline here but again this portion if you clearly see there is a clear difference over here okay. So this portion and then you have a channel which is similar to this what you have okay. So the ancient channel here. So, this is your drowned shoreline and this is the area as I was talking about that this have a different shade okay.

This got subsided or submerged after 2004 earthquake okay. So this is an example of the drowned shoreline as well as the submerged area. I will remove this so that you can clearly see it or differentiate at least, you try to see this portion here and then you will be able to make out the drowned area okay, even this is submerged okay.

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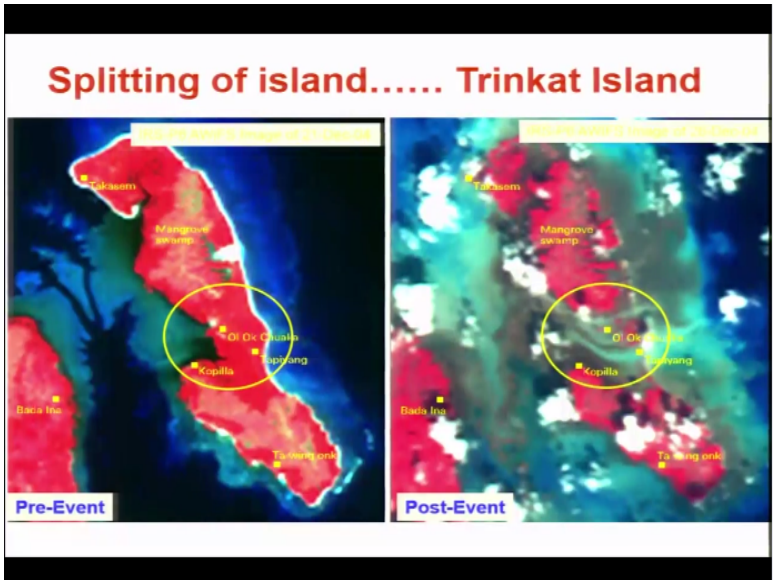

Now splitting of island that is in Trinkat Island, so this is before 2004 and if you see the date I will request (()) (07:44) to make it correct okay correct to see properly it says 21 December 2004 okay and what happened in 2004 December 26th okay? You can easily make out the difference okay. You see this portion here comparatively what you see here okay fine. That is a variation or the difference maybe that this was because of the land level change which took place, the area subsided okay.

And the island is not having that much of elevation to protect the movement of the waves okay or the ocean waters okay. So ocean water crossed the island here filtered into the inundation of this part. So what you see is the splitting of two islands, now this is one island, this is another island. Now water flows through and through, earlier it was not okay because the area went down, subsided, you are able to see this okay.

So you can compare this and see what happened, so again I am going to use the satellite data okay.

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Now this is oblique aerial photographs which we took, shadow here you see is the blades of the airplane engine and this is what they say the splitting of the island okay. This portion which I have shown here is in here again, so earlier it was the land mass was exposed here but because of the subsidence the water has flown through and through giving an impression that this island has been splitted in two okay fine. Of course, in some areas there was erosion because of the Tsunami waves.

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So Tsunami impact gained another satellite photo or it shows the difference between before and after okay same area. So the idea here is to show you this that you can easily make out that how much portion was affected by the Tsunami waves okay. So there is same island over here but now you cannot see the same existing okay, even if you can see this very clear, a bridge has been blown off from here okay.

And most of this portion here has gone okay and over here also this area maybe you can see this only this portion here and then most of the area I am just doing rough this thing okay. This whole area has been affected okay. So you can easily make out that how much area got affected and how much land we lost okay during 2004 okay.

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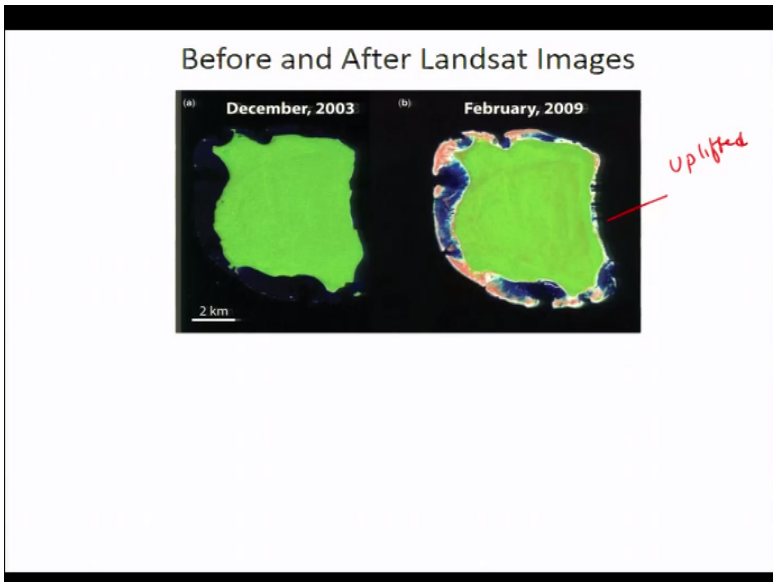

There is another example from Sentinel Island but this shows the emergence okay. The area got uplifted and the Sentinel Islands exist along the west coast of Andaman Islands okay.

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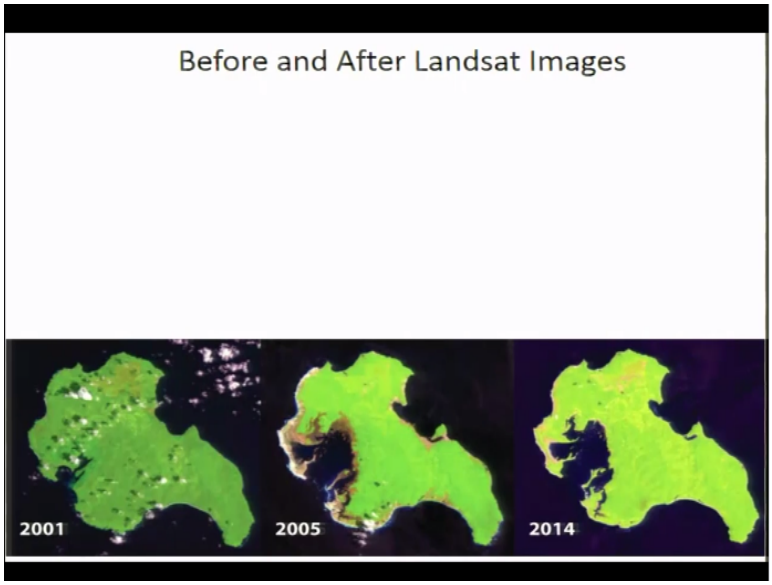

Similarly, like this also you can make out easily that how much area was affected from different images okay. So comparison of different images also helps you in typical of land-use pattern okay.

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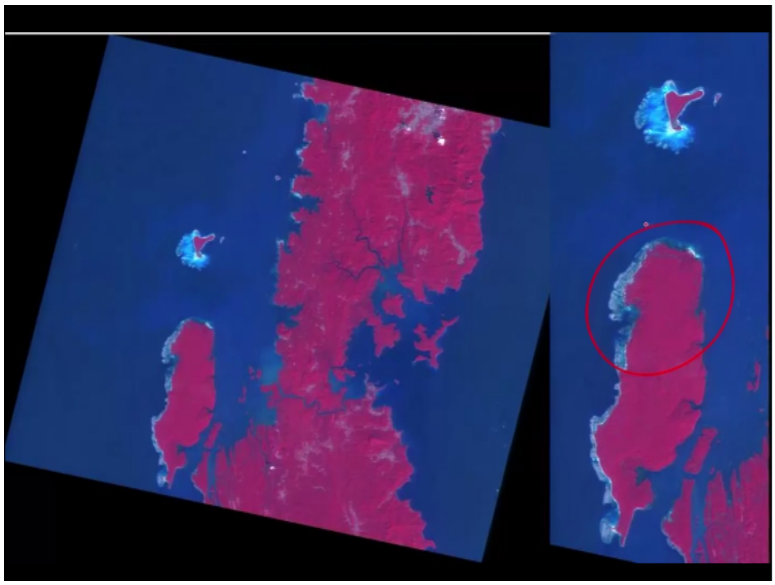

Another example from before and after, so this is an after one okay where you have this again this is an Interview Island and North Reef Island which shows the emergence of the area okay. So next photograph from this area will show you this is before and this is after okay.

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So this is an Interview Island which shows the uplift of the coral reef and this is an Interview Island which also shows the uplift of the coral reefs okay. So the area had uplifted and the coral reef exposed to the surface okay. So you can see a large number of microatolls here which are sitting above the mean sea level.

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Now coming to this, these are few aerial photographs from which we will try to tell you that how you can extract the landforms okay. So the different type of fluvial landforms we already discussed in the previous part but in these we will show how quickly you can identify and extract the information of different landforms okay and that also helps you in locating the sides for if you are coming up with a future development okay.

I will do this and then we will stop here but this is the one okay. Now if you look at this one what this photograph what best you can trace out is the most prominent features okay. So you have an outline here. Now this of course we can easily make out and say that this is the present-day channel and in between we have some channel bars okay. So this is the present part of the channel of course this all bars are the part of active floodplain.

And then here if you carefully see this portion okay is your cliff. This is your riverbank okay. Similarly, on this side also you can see this okay. So this portion becomes your terrace as well as here also. Now the other part which you will talk about will be the shape or the morphology of the channel. So you have meander here, you have meander here okay. So this portion will be more erosive, this portion will be erosive and this portion will be depositional areas okay.

So this you can easily mark okay as well as other than that you can demarcate again and again these are the channels okay which are coming and meeting okay. There are the streams which are coming and meeting the main stream here okay. These are the hilly areas which you can mark okay.

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Now coming to the next photograph again, these are very similar but black and white photos where you can pick up the fluvial landforms. One thing very important here we can ask while tracing out the landforms here okay but why the channel is so straight here okay and then you have a very thin portion of vegetation here okay. Now this channel here what we say is your channel and this is an example of a channelized flow okay.

So artificially constructed levees on either side to allow the water to flow through and through here. Other than that another important feature which you may be able to pick up and it will be easier if we see this in three dimension okay. So there is a fault which runs here okay very active fault along this line here.

Anyways, this is another part but this one is a typical of a channelized flow where we can see the levees on either side which are protecting this area within the peak flat okay. So water will not spill over. Now if you have to draw the cross-section how it looks like okay? Here cross-section will be something like this okay. You have a channel here and then you have so these are the areas which you want to protect.

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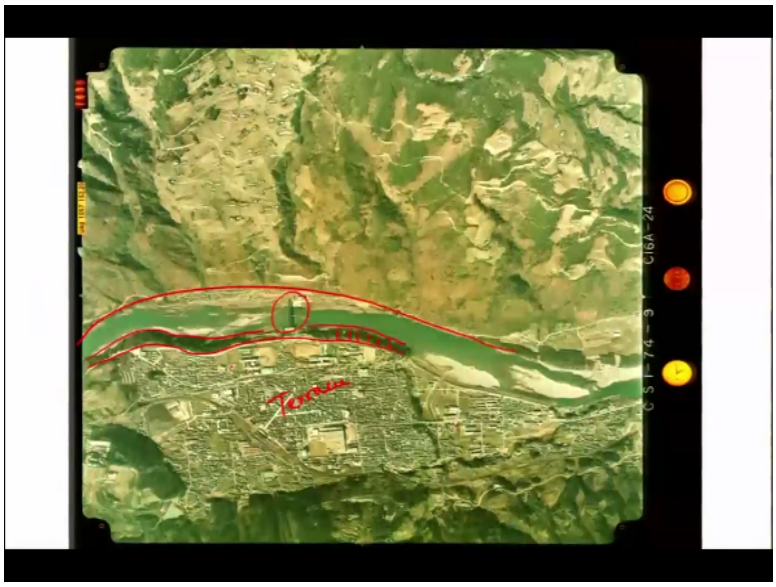

But if you see here okay it is again very typical of your channel here and then along with that you have a settlement sitting on this region okay. So if you carefully observe, then you can identify some man-made structures, this is the bridge here but at the same time if you see the portion like accumulation of the water on both the sides okay probably could be a barrier here okay fine.

But here this portion you see and this contact here is your riverbank okay. So this becomes terrace and again if you see this one you are having meander, so this portion is getting eroded and this portion is not getting so much affected okay fine.

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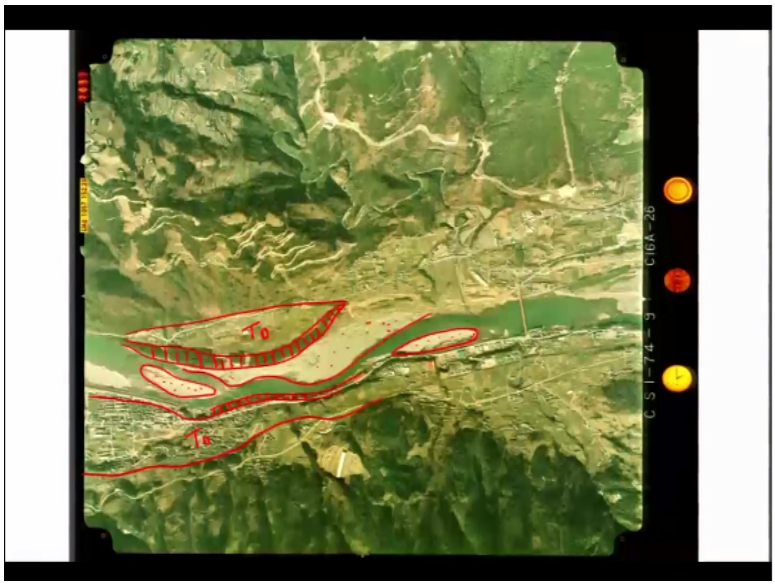

Another example of the channel morphology where you can easily pick up the sandbars and the meander bars here also. So I will give you some exercises okay which will help you in

identifying and delineating such features okay. Now this is a cliff here which goes like that okay. So this is one surface and same surface at the same height okay is also seen on the other bank. So this is also the same and this portion is the base of the hills okay.

So this is one surface, so this if I say the tilt T1 or T0, so this is also T0 surface here. So like that you can pick up several landforms and this a present-day bar. It is part of the active floodplain.

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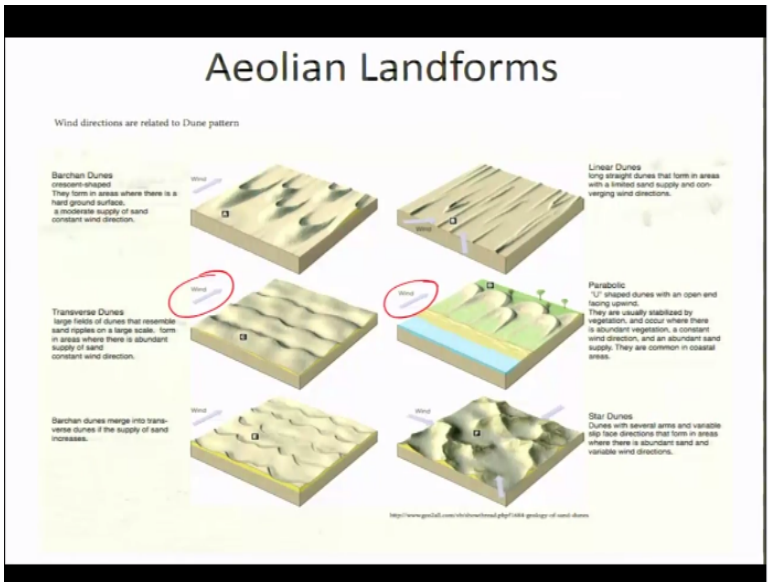

We will discuss in greater detail like we have not talked about the different type of Aeolian landform except one slide and one area of which I was talking close to Gujarat is along the border of India and Pakistan that is Thar Desert okay. Now getting into the landscape identification of Aeolian developed by the wind action, we need to learn little bit about that how it looks like okay like different dunes how it looks like either they are barchans or we say transposed dunes or we say longitudinal or linear dunes, parabolic dunes, star dunes okay.

So what type of features we will see on the surface okay because we have typical of like what you see here okay the wind directions are been shown here okay fine but then also we are having different type of landforms related to the wind action okay. So this is the windward side and this is the leeward side okay and then you are having barchans dunes, again you are having the wind direction from here.

But then you are having the leeward side on that okay fine. So based on the shape and all that, we will try to get into the details of this one and then we will try to see that how it looks

like on the surface of the earth from the satellite data okay. So we will stop here and will continue in the next lecture okay. Thank you so much.