

**Remote Sensing and GIS for Rural Development**  
**Professor Pennan Chinnasamy**  
**Centre for Technology Alternatives for Rural Areas (CTARA)**  
**Indian Institute of Technology Bombay**  
**Week 11**  
**Lecture no. 01**  
**Remote Sensing based indicators database**

(Refer Slide Time: 0:17)



The slide thumbnail displays the following information:

- Remote Sensing and GIS for rural development**
- Week 11: Lecture 1**
- PENNAN CHINNASAMY**
- FACULTY:**
- CENTRE FOR TECHNOLOGY ALTERNATIVES FOR RURAL AREAS (CTARA)**
- INTERDISCIPLINARY PROGRAM ON CLIMATE STUDIES (IDPCS)**
- CENTRE FOR POLICY STUDIES (CPS)**
- CENTRE FOR MACHINE INTELLIGENCE AND DATA SCIENCE (C-MINDS)**
- INDIAN INSTITUTE OF TECHNOLOGY - BOMBAY**
- NPTEL - REMOTE SENSING AND GIS FOR RURAL DEVELOPMENT**
- P.Chinnasamy@iitb.ac.in**

Hello everyone, welcome to the NPTEL course on remote sensing and GIS for rural development, this is week 11, lecture 1. While concluding week 10 we looked at a lot of indicators that can be used for crop statistics of the indicators, we look in depth on NDVI, the Normalized Difference Vegetation Index. And we looked at multiple platforms that can be used to share NDVI data as raw data. For example, Bhuvan, NASA's data, you could download it and do calculations.

However, we also showcased some platforms where the analysis has already been done and provided as an output. This is important, because we do get to see the analysed data quickly and look into the search aspects. So, now slowly, what is happening is we are getting high speed computing facilities, internet and memory capacities as clouds, so these data can readily be downloaded, applied, calculated for indicators. So, what is missing? What is missing is how do you apply these data? So, now, initially, we had data issues, but finding applications has become more-more difficult.

(Refer Slide Time: 02:02)

**RS for Rural Development**

2

- **Week 10:**
  - RS for Crops statistics
  - RS indicators for Crop growth/acreage/health – NDVI
  - NDVI: BHUVAN/NASA/Giovanni/Sentinel-Hub
- **Week 11:**
  - RS indicators database
  - RS and Crowd Sourced data for Rural Development
  - RS and Crowd Sourced data for Rural Infrastructures
    - Schools
    - Health care
  - Gov. Databases (MGNREGA/IWMP)

So, we are looking at remote sensing for Rural Development, datasets specifically. And as I said the week 10 we started with an analysis of remote sensing need for crop statistics, because there are a lot of issues in crop statistics in the current system, lot of latency, latency is delay and transparency. Transparency means is it unbiased, is it less prone to human and instrumentation errors, etc. So, there was less transparency in this aspect, because we do not know when the statistics was taken readily I am saying for a public or Research Institute.

Whereas, if you use remote sensing based data along with the observation data, there is more transparency, you know exactly when the image is taken, you have a to the minute when it was taken and download it. And you also have the proven record of the use of the data through scientific literature and lot of people have vouched for particular software's driven these remote sensing data.

So, now, we will look into further analysis of these indicators. So in week 10, we looked at crop indicators of a crop type and crop yield mapping and how they are very-very important for multiple stakeholders. So I am using the summary kind of summary between week 10 and week 11, because due to time availability, we have been focusing on each week separately and there is a continued link between each week which we will discuss in week 12 which is the last week.

So, in week 10 we looked at the need for remote sensing data for crop statistics, because there is delay there is data issues and data gaps along with bias and transparency. Then we looked at remote sensing indicators for crop growth and health acreage and NDVI was found through

literature review as top crop indicator on vegetation indicator. If we remember that when we looked into each of these government portals, the Indian ones, the United States, the European Union's. The Indian through Bhuvan, the United States through NASA and Giovanni Earth Explorer and also the European Union's Sentinel hub.

We noticed that only 2 indicators came up as dominant and of that NDVI is the dominant across these platforms and our research papers and that is why we spend more time on explaining the theory of NDVI and what data is needed, how do you calculate it? When we step into how do you calculate NDVI we showed the equation of NIR minus red by NIR plus red, and then we said the range is minus 1 to plus 1, giving classes for the range as minus 1 is water, barren to plus 1 is the peak healthy vegetation.

However, even though this can be done geo gi software, we discussed the possibility of using platforms and the platforms were given as Bhuvan, NASA, Giovanni, Sentinel hub. So in week 11, what we will do is we will build upon these exercise and then showcase that the NDVI has been improved and we will stop with NDVI in lecture 10 itself, because there are multiple other indicators that we should be looking at. We will have a hands on quick indicator for water and also look at some other very-very important aspects.

So the more sensing indicators database, we will go through today in week 11 first lecture, followed by remote sensing tools, which are aided with crowdsourcing tools, I will revisit the synergized mapping schematic and show that how satellite data, government observation data and crowd sourced data can be pulled together in a complete platform and used for rural development.

So we will be using QGIS extensively in week 11 and showcasing how these data can be used, plotted, etc. We will go back and forth between Google Earth Pro, I have shown you how to install it, how to run it, so hopefully you could have Google Earth Pro installed and QGIS installed. Very-very important to install QGIS and keep it ready for this week's exercise. And then we have, as I said, the rural infrastructures we will dig into this is not just a rural remote sensing and GIS course for water management and crop management, but also health care, schools, roads are important.

The only issue here is most of the population is dependent on agriculture and for them, that is the livelihood that is where they want to see themselves for the full life, they do not want to come out into urban systems where education demands it the basic education is done. So as I

would say normally in villages, you will see girl child stopping at 10, and boys also stopping at 9 and 10, 11, 12, maybe because he entered into farming, so only some have the opportunity to go out and study. So the schools are placed in the villages, but the higher education is outside the villages you will have to travel and come back.

So depending on a lot of social and economic limitations and challenges, you are allowed to go for education. So my father, as I said, came from a village studied a PhD in the US through these systems village school until tenth and then PUC in Trichy, the main town and then college in Chennai, and then PhD. in the US, whereas my mother did not have that option, she was stopped at tenth standard. So here is where a live example of rural limitations are there, slowly this is changing, which is good, only when it changes everyone has access to quality education.

So we will go through Week 11 specifically mentioning these schools healthcare systems and how they have to be updated by the government using the data from remote sensing and processing sources. Then we will also look into some government databases like MGNREGA and IWMP and showcase how these could be evaluated further used further for bridging the gap between the available data, then there is a data gap of errors and latency, the most important error in the gap or data gap is a data issue I will say is latency.

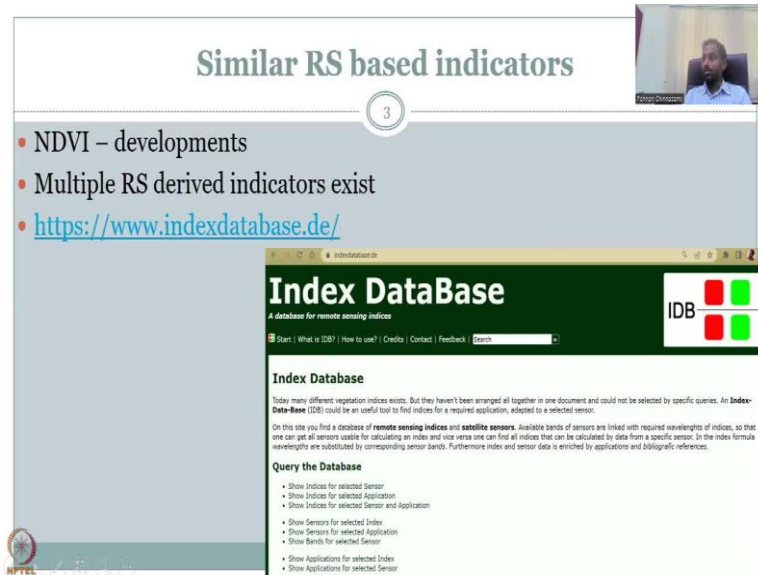
How can you prepare for the next 10 years if you have data only from the past 20 years data, let us say if I need to plan from 2023 to 2050 or 2023 to 2033, I do need data from 2011 to 22, however, it stops at 2011. For example, the census data we have is 2011. The next census data should come out soon, but due to COVID it was kind of stopped.

So, please think on these terms that for rural development to happen in a very sustainable way, we need to have current data and sometimes the data is limited due to challenges faced by the government, it is very-very expensive to send capacity to collect data in the villages, rural areas, cities are more easier because people commute within the city they get the data. But villages are very, very difficult in some areas where tribals are there it is very inaccessible also, the forest and livelihood options they have. So, that data is very difficult to get and for those reasons we can use remote sensing data.

So, that is what we will be using in this course of lecture, we will go through a particular beautiful software, community initiated, volunteer initiative, open source, that mixes remote sensing data and open source data and those who are taking this course I hope you can also

contribute to the community by using the data, contributing data, and also checking if the data is correct or not.

(Refer Slide Time: 11:29)



The slide is titled "Similar RS based indicators" and features a small video inset of a speaker in the top right corner. The main content consists of a bulleted list:

- NDVI – developments
- Multiple RS derived indicators exist
- <https://www.indexdatabase.de/>

Below the list is a screenshot of the Index DataBase website. The website header includes the title "Index DataBase" and the tagline "A database for remote sensing indices". It also features a navigation menu with links for "Start", "What is IDB?", "How to use?", "Credits", "Contact", and "Feedback", along with a search bar. The main content area of the website is titled "Index Database" and contains introductory text and a "Query the Database" section with several options:

- Show Indices for selected Sensor
- Show Indices for selected Application
- Show Indices for selected Sensor and Application
- Show Sensors for selected Index
- Show Sensors for selected Application
- Show Bands for selected Sensor
- Show Applications for selected Index
- Show Applications for selected Sensor

So, this we will start this week's lecture. And what we have noticed that NDVI has been used widely, but also there has been updates of NDVI or developments of NDVI. And that is multiple reasons, one is for a site specific regions and site specific conditions, maybe the NDVI did not work well. So they used an enhanced NDVI, E-NDVI is there. And some researchers would put their names in front saying, let us say Pennan NDVI, P-NDVI. So, these kind of NDVI's are also there in literature, the base is the same, the ideology is the same like which means that basic ideology is that a healthy plant will reflect more green and infrared, whereas a non-healthy plant will absorb the green color.

So you see a different set of colors, reflectance, and that is the basic principle that is being used. But E-NDVI would use hyper-spectral, multispectral images, rather than maybe red, they will use a different color, and then the principle is the same, so they will use it or it will be also crop specific. So for example, your green plants will always stay green, but then when it grows and starts to yield, it turns to brown like paddy and rice, I say. Normally, people remember wheat as brown, but when you go to the field, when it is growing, it is always green and then when it is mature it becomes brown or golden brown color, husk is the wheat paddy husk is also brown in color.

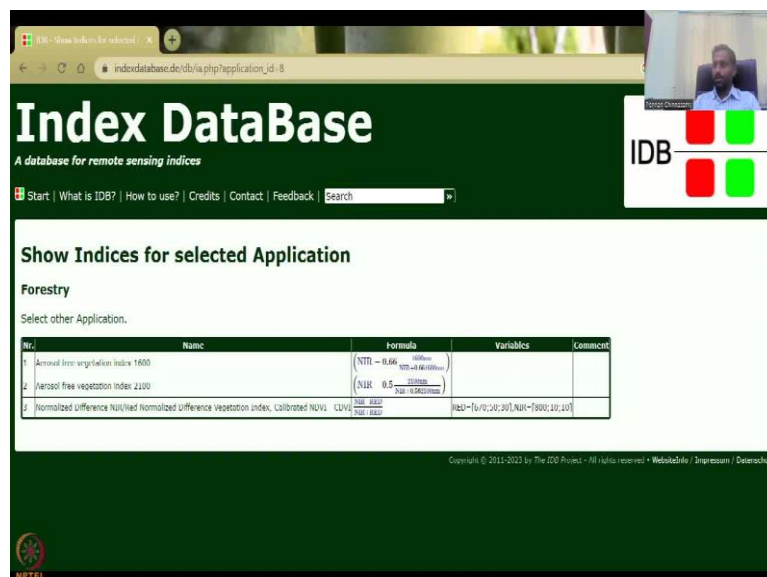
So these colors are reflected in a different way. So just because green is not there does not mean that the plant is healthy, it has matured, and then it is ready for harvest. So these are

captured as different indicators, we will see some of them now, there are multiple-multiple remote sensing derived indicators, first is the same reason that costly to measure on the ground, observation data is limited, there is a big latency, latency as in gap between the data collected and the data distributed or published.

So for example, an observation data, the government will take the data, then bring it back, it takes a couple of weeks to travel from the rural to the cities where offices are there, then they start working on the data, cleaning the data, etc. etc. takes time, so that is why you see a latency of almost a year. So a year or six months between observation to putting it on the web page, whereas the remote sensing data is there, all you need is a model which has NDVI as a model already existing, you just apply the model to the observation data, and then see how the results come up.

On this note, I would like to say that just not NDVI there are multiple-multiple indicators a lot of people have done research and this website I have found is really-really impressive. It gives you almost all the indicators that you would like to access and the curators of this website have done really well. It is a database from Germany, a database for remote sensing indices, as it says on this part of the webpage. I will be happy to explain this in this current lecture in over the next 20 minutes.

(Refer Slide Time: 15:13)



The screenshot shows the Index DataBase website interface. The main heading is "Index DataBase" with the subtitle "A database for remote sensing indices". Below the heading is a navigation menu with links: "Start", "What is IDB?", "How to use?", "Credits", "Contact", "Feedback", and a search bar. The main content area is titled "Show Indices for selected Application" and is currently set to "Forestry". Below this, there is a table with the following data:

№.	Name	Formula	Variables	Comment
1	Arsenal Iron Vegetation Index 1600	$NTI = 0.66 \frac{NIR - SWIR}{NIR + SWIR}$		
2	Arsenal Free Vegetation Index 2100	$NIR = 0.5 \frac{NIR - SWIR}{NIR + SWIR}$		
3	Normalized Difference Normalized Difference Vegetation Index, Calibrated NDVI	$CNDVI = \frac{NIR - SWIR}{NIR + SWIR}$	$NIR = (NIR - 200) / 100; SWIR = (SWIR - 1000) / 100$	

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Index DataBase  
A database for remote sensing indices

Start | What is IDB? | How to use? | Credits | Contact | Feedback | Search

## Index Database

Today many different vegetation indices exists. But they haven't been arranged all together in one document and could not be selected by specific queries. An **Index-Data-Base (IDB)** could be an useful tool to find indices for a required application, adapted to a selected sensor.

On this site you find a database of **remote sensing indices** and **satellite sensors**. Available bands of sensors are linked with required wavelengths of indices, so that one can get all sensors usable for calculating an index and vice versa one can find all indices that can be calculated by data from a specific sensor. In the index formula wavelengths are substituted by corresponding sensor bands. Furthermore index and sensor data is enriched by applications and bibliographic references.

### Query the Database

- Show Indices for selected Sensor
- Show Indices for selected Application
- Show Indices for selected Sensor and Application
- Show Sensors for selected Index
- Show Sensors for selected Application
- Show Bands for selected Sensor
- Show Applications for selected Index
- Show Applications for selected Sensor

### Query the Database

- Show Indices for selected Sensor
- Show Indices for selected Application
- Show Indices for selected Sensor and Application
- Show Sensors for selected Index
- Show Sensors for selected Application
- Show Bands for selected Sensor
- Show Applications for selected Index
- Show Applications for selected Sensor

### List of available data

- List of available Indices
- List of available Sensors
- List of available Applications
- List of References
- Visualisation of Sensor Bands
- Visualisation of required Index Wavelengths

### Your feedback

- Submit your suggestions

### JSON-API

If you want to use the data for Webservices, you can use the JSON-API. In order to get access to the API, please contact us.

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Index DataBase  
A database for remote sensing indices

Start | What is IDB? | How to use? | Credits | Contact | Feedback | Search

## Feedback

### Your Feedback

Subject

Text

Name


E-Mail

indexdatabase.de/info/contact.php

# Index DataBase

A database for remote sensing indices

Start | What is IDB? | How to use? | Credits | Contact | Feedback |




## Contact information

For further information please contact

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indexdatabase.de/info/credits.php

# Index DataBase

A database for remote sensing indices


Start | What is IDB? | How to use? | Credits | Contact | Feedback |



## Credits

Conceptualized and realized by Verena Henrich, Gunther Krauss, Christian Götze and Christopher Sandow.

We thank




for supporting the implementation of JSON-API. Check visualisation of indices on Sentinel Playground.

Documentation of JSON-API

### Publications

- Henrich, V., Krauss, G., Götze, C., Sandow, C. (2012): **IDB - www.indexdatabase.de, Entwicklung einer Datenbank für Fernerkundungsindizes.** AK Fernerkundung, Bochum, 4-5. 10. 2012. (PDF)
- Henrich, V., Jung, A., Götze, C., Sandow, C., Thürkow, D., Gläßer, C. (2009): **Development of an online indices database: Motivation, concept and implementation.** 6th EARSeL Imaging Spectroscopy SIG Workshop Innovative Tool for Scientific and Commercial Environment Applications Tel Aviv, Israel, March 16-18, 2009. (PDF)



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# Index DataBase

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### Talks

- Henrich, V. (2012) **IDB - Index-Database; Development of a database for remote sensing indices.** ZFL-Colloquium, Bonn, 21. 06. 2012.
- Henrich, V. (2012) **Index-Database; Recent Developments.** Crop Science Colloquium, University of Bonn, 23. 05. 2012.

technical realization of the webpage: G. Krauss.

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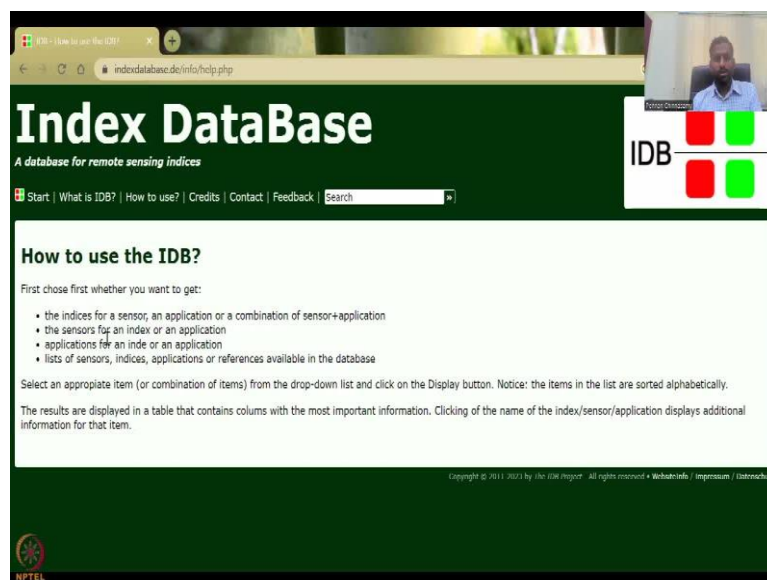




So, let us go through this link I will click the link and share now. So, we are opening the webpage, so hope my screen is visible yes it is. So, when you go to Start Page, normally the database or DE you will come to this and this is the logos they have, you can look at it as a database for remote sensing indices, indicators and create different vegetation taxes exist, but they have not been put in a common document which is very-very important, because you should not be redoing what others do, there is lots of indicators, just look at the positives and negatives, look at the literature review and then use it. But where do you use it, what is the formula etc.

So, this person has put in very-very well and a lot of lot of information is there we just see how this is going to be. So you can give feedback, we will come back we can put your name, numbers and give a feedback contact is Verena Henrich and Katharina Bruser of University of Bonn, institute of crop science. And then credits, who they give credit conceptualize, realized by Verena Henrich, Ginthar Krauss, Christian Gotze, and Christopher Sandow and they thank Sentinel hub, because it is not only Sentinel data, it is a lot of data that has been put up, it is old, they started in 2012, almost 10 years old, but still it gets updated, which is really fascinating.

(Refer Slide Time: 16:52)



The screenshot shows a web browser window displaying the Index DataBase (IDB) website. The page title is "Index DataBase" with the subtitle "A database for remote sensing indices". The navigation menu includes "Start", "What is IDB?", "How to use?", "Credits", "Contact", and "Feedback". A search bar is located in the top right corner. The main content area is titled "How to use the IDB?" and contains the following text:

First chose first whether you want to get:

- the indices for a sensor, an application or a combination of sensor+application
- the sensors for an index or an application
- applications for an index or an application
- lists of sensors, indices, applications or references available in the database

Select an appropriate item (or combination of items) from the drop-down list and click on the Display button. Notice: the items in the list are sorted alphabetically.

The results are displayed in a table that contains columns with the most important information. Clicking of the name of the index/sensor/application displays additional information for that item.

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The screenshot shows the homepage of the Index DataBase (IDB) website. The browser address bar displays 'indexdatabase.de/info/idb.php'. The page features a green header with the title 'Index DataBase' and the subtitle 'A database for remote sensing indices'. A navigation menu includes links for 'Start', 'What is IDB?', 'How to use?', 'Credits', 'Contact', and 'Feedback', along with a search bar. A video thumbnail in the top right corner shows a man speaking. The main content area is titled 'What is IDB?' and contains the following text:

**What is IDB?**  
The IDB is a tool for working with remote sensing indices. It provides a quick overview of which indices are usable for a specific sensor and a specific topic. There is no such tool available at the moment as far as we know, despite the necessity to have a more structured overview of current research results in the area of remote sensing indices.

**Motivation**  
Today, many different vegetation indices exist, but they have not been arranged together in one document, nor is it possible to select or query them interactively. We consider it valuable, to have a databased tool that can be used to query indices for criterias like sensors and applications.

**Concept**  
The basic idea of the IDB is to allow the user to select a remote sensing sensor, an application etc. and to get an overview of all possible indices fitting the chosen selection. By selecting an index, all possible sensors are listed, and the best fitting bands were also automatically calculated. A detailed literature list, as well as the references are also displayed in the overview. In the future, the user will also be able to download data for a remote sensing-software like ERDAS-Model-Maker or ENVI-IDL and export the literature list or the formulas in different formats.

**Further Development**  
• Adding more bibliographic references

The NPTEL logo is visible in the bottom left corner.

This screenshot shows the same website page as above, but with additional content under the 'Further Development' and 'And last but not least' sections.

**Further Development**

- Adding more bibliographic references
- Extending the application section
- Export indices as IDL program code
- Implementing community functionalities (discussion board, user comments on indices)

**And last but not least**  
If you find any mistake, would like to add new data, have any ideas for improvement or just want to give us some feedback, please do not hesitate to contact us.

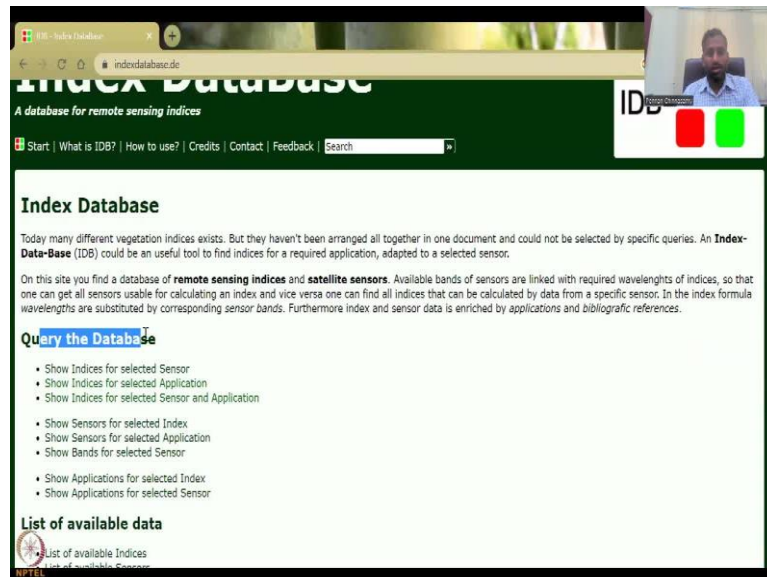
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And then how to use it is the some tutorials, indicators, click, etc. So which we will do now. So what is IDB is further development, they are adding more references, so you do not have to do the literature review, they are doing it for you, and if you have any mistakes, any new data that can be added, which is missing from this database, you can put it in the contact feedback section and then give it to them. So here it is, you can also do a search NDVI, etc. and then see if you could search for a particular database.

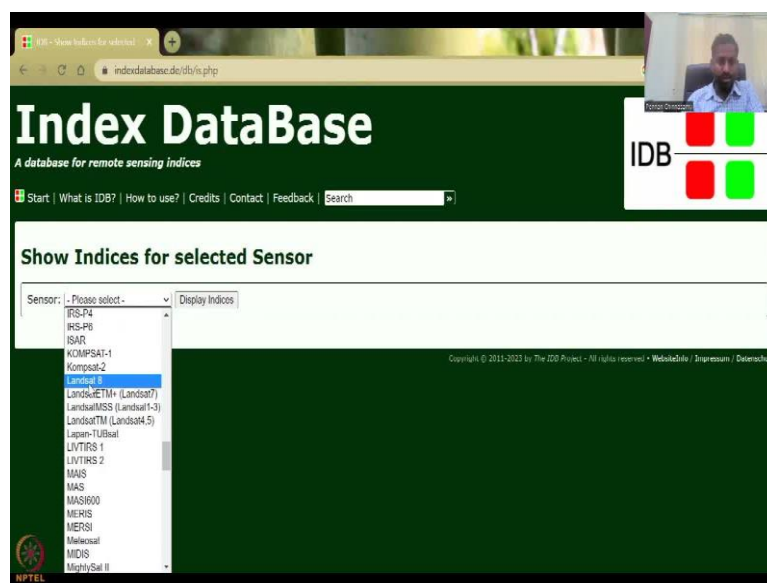
Then what you could do is you can actually look into the different sections in this database that can be created and you can see that how people have been used using citing. So it is also good to cite it. It is not needed as they did not put any disclaimers, but it is always good that you can tell your friends and how I am saying I immensely been helped by this website, a lot

of my students, I hear this on day one, the PhD students to go through it, because you do not have to reproduce what others are doing already.

(Refer Slide Time: 18:18)



The screenshot shows the homepage of the Index Database (IDB). The browser address bar displays 'indexdatabase.de'. The page features a green header with the 'Index Database' logo and the tagline 'A database for remote sensing indices'. Below the header, there is a navigation menu with links for 'Start', 'What is IDB?', 'How to use?', 'Credits', 'Contact', and 'Feedback', along with a search bar. The main content area includes a section titled 'Index Database' with an introductory paragraph explaining the database's purpose. Below this is a section titled 'Query the Database' with a list of search options: 'Show Indices for selected Sensor', 'Show Indices for selected Application', 'Show Indices for selected Sensor and Application', 'Show Sensors for selected Index', 'Show Sensors for selected Application', 'Show Bands for selected Sensor', 'Show Applications for selected Index', and 'Show Applications for selected Sensor'. At the bottom, there is a section titled 'List of available data' with links to 'List of available Indices' and 'List of available Sensors'. A small video feed of a person is visible in the top right corner.



The screenshot shows the 'Show Indices for selected Sensor' page on the Index Database website. The browser address bar displays 'indexdatabase.de/ids/is.php'. The page features a green header with the 'Index Database' logo and the tagline 'A database for remote sensing indices'. Below the header, there is a navigation menu with links for 'Start', 'What is IDB?', 'How to use?', 'Credits', 'Contact', and 'Feedback', along with a search bar. The main content area includes a section titled 'Show Indices for selected Sensor'. A dropdown menu for 'Sensor:' is open, showing a list of sensors: 'IRS-P4', 'IRS-P6', 'ISAR', 'KOMPSAT-1', 'Kompsat-2', 'Landsat-3', 'LandsatETM+ (Landsat7)', 'LandsatMSS (Landsat1-3)', 'LandsatTM (Landsat4,5)', 'Lapan-TUbaal', 'LVTIRS 1', 'LVTIRS 2', 'MAIS', 'MAS', 'MASR00', 'MERIS', 'MERSI', 'Mediasat', 'MIDIS', and 'MightySat II'. A 'Display Indices' button is visible to the right of the dropdown menu. A small video feed of a person is visible in the top right corner. The footer contains the text 'Copyright © 2011-2023 by The IDB Project - All rights reserved - WebSiteInfo / Impressum / Datenschut

Index DataBase  
A database for remote sensing indices

Start | What is IDB? | How to use? | Credits | Contact | Feedback | Search

Video Overview

### Show Indices for selected Sensor

Sensor: Please select - Display Indices

- IKONOS-2
- ILAS-II
- IMS-1
- IMS
- INSAT-3E
- IRS-1A
- IRS-1B
- IRS-1C
- IRS-1D
- IRS-P2
- IRS-P3
- IRS-P4
- IRS-P8
- ISAR
- KOMPASAT-1
- Kompas-2
- Landsat 8
- LandsatETM+ (Landsat7)
- LandsatMSS (Landsat1-3)
- LandsatTM (Landsat4-5)

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Index DataBase  
A database for remote sensing indices

Start | What is IDB? | How to use? | Credits | Contact | Feedback | Search

Video Overview

### Show Indices for selected Sensor

Sensor: Please select - Display Indices

- ILAS-II
- IMS-1
- IMS
- INSAT-3E
- IRS-1A
- IRS-1B
- IRS-1C
- IRS-1D
- IRS-P2
- IRS-P3
- IRS-P4
- IRS-P8
- ISAR
- KOMPASAT-1
- Kompas-2
- Landsat 8
- LandsatETM+ (Landsat7)
- LandsatMSS (Landsat1-3)
- LandsatTM (Landsat4-5)
- Luzern-TÜBital

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Index DataBase  
A database for remote sensing indices

Start | What is IDB? | How to use? | Credits | Contact | Feedback | Search

Video Overview

### Show Indices for selected Sensor

**AWIFS**

Select other Sensor.

No results for the selected combination.

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NPTEL



indexdatabase.de/idb/is.php?sensor\_id=168

General Formula	Formula	Calculated	Comment
	$\frac{1.22 \sqrt{\lambda \cdot \sin^2 \theta}}{2 \cdot \sin^2 \theta} \cdot \sqrt{\frac{1.22 \cdot \sin^2 \theta}{\lambda} + 0.981} \cdot \sqrt{\frac{1.22 \cdot \sin^2 \theta}{\lambda} + 0.981}$	Automatic	More
	$\left( \frac{\text{Near\_Infrared} - 0.66 \cdot \text{SWIR}_1}{\text{Near\_Infrared} + 0.66 \cdot \text{SWIR}_1} \right)$	Automatic	More
	$\frac{\text{SWIR}_1}{\text{SWIR}_2}$	Automatic	More
	$2.0 \cdot \text{Near\_Infrared} - \text{Red}$	Automatic	More
	$\frac{\text{Near\_Infrared} \cdot \text{Red} - \text{Red}^2}{\text{Near\_Infrared} + \text{Red} - \text{Red}^2}$	Manual	More
	$-0.18 + 1.17 \cdot \left( \frac{\text{Near\_Infrared} - \text{Red}}{\text{Near\_Infrared} + \text{Red}} \right)$	Automatic	More
	$\frac{\text{Near\_Infrared} \cdot \text{SWIR}_1}{\text{Near\_Infrared} + \text{SWIR}_1}$	Manual	More
	$\frac{\text{SWIR}_1}{\text{SWIR}_2}$	Automatic	More
	$\frac{\text{Near\_Infrared}}{\text{Green}}$	Automatic	More
	$\frac{\text{Red} - \text{Blue}}{\text{Red}}$	Manual	More
	$\frac{\left( \frac{\text{Red} - \text{Green}}{\text{Red} + \text{Green}} \right) + 0.5}{\left( \frac{\text{Red} - \text{Green}}{\text{Red} + \text{Green}} \right) + 0.5}$	Automatic	More
	$\frac{\text{Blue} - 1}{\text{Green} - 1}$	Automatic	More
	$\frac{\text{Near\_Infrared} - \text{Green}}{\text{Near\_Infrared} + \text{Green}}$	Automatic	More

indexdatabase.de/idb/is/single.php?sensor\_id=244&sensor\_id=168

# Index DataBase

A database for remote sensing indices

Start | What is IDB? | How to use? | Credits | Contact | Feedback | Search

## Information for Sensor and Index

### Formula

General Formula	$\frac{\text{SWIR}_1 + 0.5}{\text{SWIR}_1 + 0.5} \cdot \sqrt{\frac{\text{Near\_Infrared} - 0.5}{\text{Near\_Infrared} + 0.5}}$
Specific Formula	$\frac{\left( \frac{\text{Red} - \text{Green}}{\text{Red} + \text{Green}} \right) + 0.5}{\left( \frac{\text{Red} - \text{Green}}{\text{Red} + \text{Green}} \right) + 0.5} \cdot \sqrt{\left( \frac{\text{Red} - \text{Green}}{\text{Red} + \text{Green}} \right) + 0.5}$
Calculated	Automatic
Comment	

### Sensor

Name	anishat 8
Full Name	
Index	11
Spectrum [nm]	120-12200
Spat. Res. [m]	15-100
Inclination	98
Platform	
Operator	ISPA / USGS

indexdatabase.de/idb/is/single.php?sensor\_id=244&sensor\_id=168

## Information for Sensor and Index

### Formula

General Formula	$\frac{\text{SWIR}_1 + 0.5}{\text{SWIR}_1 + 0.5} \cdot \sqrt{\frac{\text{Near\_Infrared} - 0.5}{\text{Near\_Infrared} + 0.5}}$
Specific Formula	$\frac{\left( \frac{\text{Red} - \text{Green}}{\text{Red} + \text{Green}} \right) + 0.5}{\left( \frac{\text{Red} - \text{Green}}{\text{Red} + \text{Green}} \right) + 0.5} \cdot \sqrt{\left( \frac{\text{Red} - \text{Green}}{\text{Red} + \text{Green}} \right) + 0.5}$
Calculated	Automatic
Comment	

### Sensor

Name	anishat 8
Full Name	
Index	11
Spectrum [nm]	120-12200
Spat. Res. [m]	15-100
Inclination	98
Platform	
Operator	ISPA / USGS
Date of Launch	2011-03-28
Comment	
Double for Indices	yes
Description	

### Index

Name	Normalized Transformed Vegetation Index
Abbreviation	NTVI
Formula	$\frac{\text{SWIR}_1 + 0.5}{\text{SWIR}_1 + 0.5} \cdot \sqrt{\frac{\text{Near\_Infrared} - 0.5}{\text{Near\_Infrared} + 0.5}}$
Variables	
Full Variables	
Wavelengths	120-1200/160



IRS - Information for Sensor in ...

indexdatabase.de/db/irs/single.php?rsindex\_id=244-&rsensor\_id=168

Band	11
Spectrum [nm]	125-12220
Spat.Res. [m]	15-100
Inclination	98
Platform	
Operator	ISRO / USIS
Date of Launch	2011-03-20
Comment	
Usable for Index	yes
Description	

### Index

Name	Corrected transformed vegetation index
Abbreviation	CTVI
Formula	$\frac{NIR+4S - \sqrt{(NIR+4S)^2 - 8S}}{NIR+4S}$
Variables	
Expr. of Variables	
WaveLengths	490-270,670-760
Source	derived from specific sensor formula
Description	

### References

No results for the selected combination.

### Visualisation

Sensor

NPTEL

IRS - Information for Sensor in ...

indexdatabase.de/db/irs/single.php?rsindex\_id=244-&rsensor\_id=168

Date of Launch	2011-03-20
Comment	
Usable for Index	yes
Description	

### Index

Name	Corrected transformed vegetation index
Abbreviation	CTVI
Formula	$\frac{NIR+4S - \sqrt{(NIR+4S)^2 - 8S}}{NIR+4S}$
Variables	
Expr. of Variables	
WaveLengths	490-270,670-760
Source	derived from specific sensor formula
Description	

### References

No results for the selected combination.

### Visualisation

Sensor

Index

NPTEL

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So here it is, you can start from here, you can search the database for a particular sensor, a satellite sensor, so if someone has said in a talk, but let us say that list 3 is used. So if you could click this and then say that what sensor it is, and then you can go down to the particular sensor and then see if it is available. So Landsat 8, for example is available, IRS is available. And then all these registration indexes all sensors, it is not only for vegetation, as it says in the writing it says vegetation, but it is not only for vegetation, there is water, land management, every other thing that can be used is there.

So we can definitely use this for multiple-multiple users. So this is the Indian satellite and it is saying like do you have any indicators specifically built for the Indian satellite? No, it is not. So you can come back and then say, Landsat. So what indicators have been made on Landsat, and you can see that it is tremendously 114 indicators have been done. So as

indicated, we just look at NDVI. So I am just going to click search here and control F and if I say NDVI 26 versions of NDVI have done, it is not just the NDVI but there is a composite NDVI, I will show you how it is different. So it is not called the NDVI it is called character transformation index. So CTVI and but the NDVI is used here.

So somewhere as I said, NDVI becomes is the base and then it gets updated and or regularly improved for a particular region or something. And here they could see, you could see that they given the formula. So red minus green, red plus green is the NDVI part they have used, visible red or visible green you can use if you do not have NIR. So red is given in the front minus green by red plus green. And then you can see here the citations automatic, calculator automatic, you can go to more info, and then it will give you a beautifully it will give you the formula specific calculator, what are the sensors that have been used, the sensors launch date kind of metadata for it, very important on the spectrum, spatial resolution completed 100 meters inclination and sometimes you also get the temporal resolution. So these are the sensors that have been used as the colors in the sensors that are being used.

(Refer Slide Time: 21:03)

ID	Name	Formula	Inputs	Output
12	Vegetation Moisture Index	$\frac{(NIR - A) - (NIR + A)}{(NIR + A) + (NIR - A)}$	NIR, A	0 to 1
17	Green Atmospherically Resistant Vegetation Index	$\frac{NIR - (GPPV_{0.65} - 0.577)}{NIR - (CORR3 - BLUE - RED)}$	NIR, CORR3, BLUE, RED	0 to 1
23	Green Leaf Index	$\frac{NIR - (0.5 \cdot NIR + 0.4 \cdot RED)}{2 \cdot CORR3 - RED - BLUE}$	NIR, CORR3, RED, BLUE	0 to 1
29	Green Normalized Difference Vegetation Index	$\frac{NIR - (0.4 \cdot RED)}{NIR + (0.4 \cdot RED)}$	NIR, RED	0 to 1
30	Green Optimized Soil Adjusted Vegetation Index	$\frac{NIR - I}{NIR + 1.2 \cdot I}$	NIR, I	0 to 1
31	Green Soil Adjusted Vegetation Index	$\frac{NIR - I}{NIR + 1.2 \cdot I}$	NIR, I	0 to 1
33	Green-Blue NDVI	$\frac{NIR - (CORR3 - BLUE)}{NIR - (CORR3 - BLUE)}$	NIR, CORR3, BLUE	0 to 1
33	Green Red NDVI	$\frac{NIR - (CORR3 - RED)}{NIR - (CORR3 - RED)}$	NIR, CORR3, RED	0 to 1
34	Blue-NDVI	$\arctan\left(\frac{2 \cdot (NIR - B)}{2 \cdot (CORR3 - BLUE)}\right)$	NIR, CORR3, BLUE	0 to 1
35	Blue-NDVI	$\frac{NIR - A}{NIR + A}$	NIR, A	0 to 1
36	Reference Percentage Vegetation Index	$\frac{NIR - (CORR3 - BLUE)}{NIR - (CORR3 - BLUE)}$	NIR, CORR3, BLUE	0 to 1
37	Intensity	$\frac{1}{2} \cdot (R + G + B)$	R, G, B	0 to 1





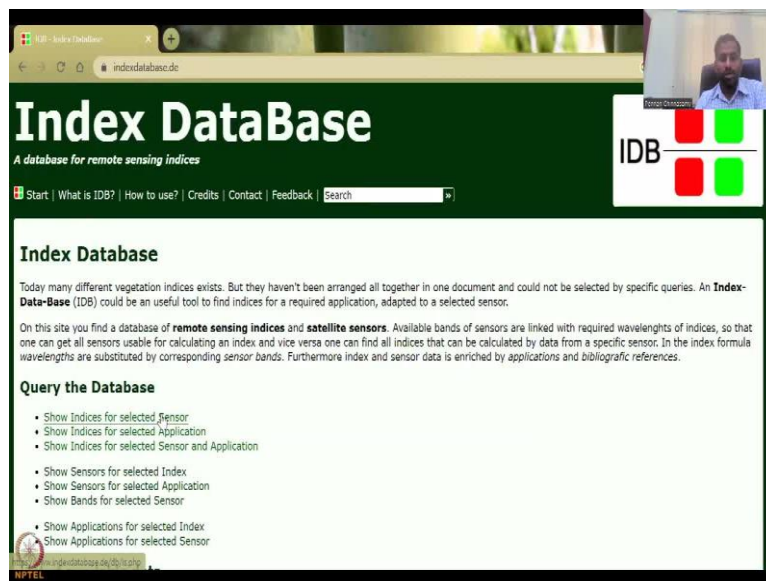
So we will go back here click back NDVI and so before populated I have done it. So let me just say NDVI. So let us look at another one. So here we have the green Normalized Difference Vegetation Index, where instead of near infrared minus red, it is near infrared minus green, and that is why G comes in front. So someone has done that G-NDVI, green, blue NDVI. So instead of Near Infrared minus red, it is green plus blue. And so you will have to add green plus blue first and undo it.

So normally, you do not see all these indicators on the bigger dashboards because these are updated or developed further, and yet it does not have that much of literature review or people using it. So it is not yet as popular as the other indicators. So infrared percentage, vegetation index is IPVI, so near infrared by near infrared plus red by 2 kind of averaging it. So average, so NIR divided by the average of NIR by red and then NDVI is added to it kind of multiplied. And then we have B-NDVI, which is known by its difference blue near blue instead of red, you are using blue. And then green normalized difference green NDVI, instead of red, you are using green. And then NDVI C.

So vegetation like see a lot of multiple, higher-higher end updation is happen. Red blue, instead of red is just red, blue. And then we have D-NDVI. So it is not actually 26 because there is double calculating somewhere I would say, around 10 to 15. Even if you divide it by 2, you will have around 15 indicators, there will be more there will be added on to this as an NDVI.

So this also actually for example also you can say as NDVI drag because near infrared minus red near infrared plus red is your NDVI, so it is kind of point one times your NDVI which is your wide dynamic range vegetation index. So, people have used NDVI and from there they are built further NDVI structures. So, this is a by sensor.

(Refer Slide Time: 23:27)



The screenshot shows the homepage of the Index DataBase website. The browser address bar displays 'indexdatabase.de'. The page features a green header with the title 'Index DataBase' and the subtitle 'A database for remote sensing indices'. A navigation menu includes 'Start', 'What is IDB?', 'How to use?', 'Credits', 'Contact', and 'Feedback', along with a search box. A video feed of a presenter is visible in the top right corner. The main content area is titled 'Index Database' and contains introductory text about the database's purpose and a list of interactive options under the heading 'Query the Database'.

# Index DataBase

A database for remote sensing indices

Start | What is IDB? | How to use? | Credits | Contact | Feedback | Search

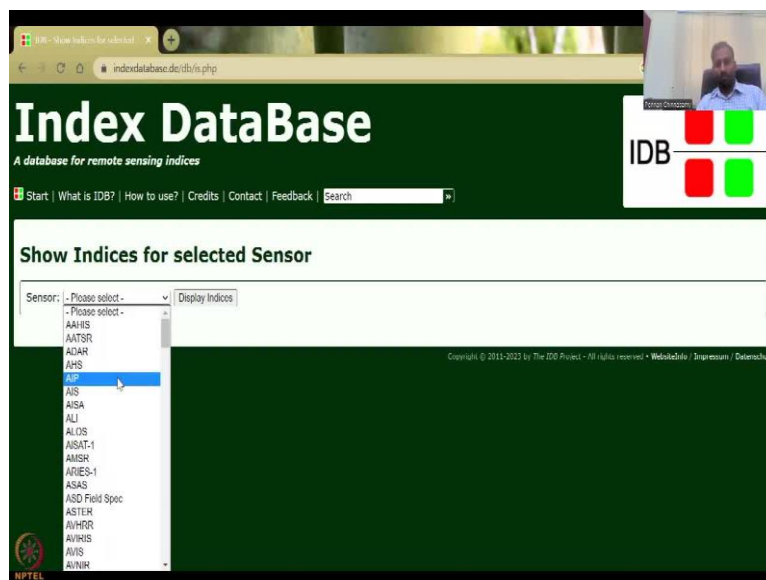
## Index Database

Today many different vegetation indices exists. But they haven't been arranged all together in one document and could not be selected by specific queries. An **Index-Data-Base (IDB)** could be an useful tool to find indices for a required application, adapted to a selected sensor.

On this site you find a database of **remote sensing indices** and **satellite sensors**. Available bands of sensors are linked with required wavelengths of indices, so that one can get all sensors usable for calculating an index and vice versa one can find all indices that can be calculated by data from a specific sensor. In the index formula wavelengths are substituted by corresponding sensor bands. Furthermore index and sensor data is enriched by applications and bibliographic references.

### Query the Database

- Show Indices for selected Sensor
- Show Indices for selected Application
- Show Indices for selected Sensor and Application
- Show Sensors for selected Index
- Show Sensors for selected Application
- Show Bands for selected Sensor
- Show Applications for selected Index
- Show Applications for selected Sensor



This screenshot shows the 'Show Indices for selected Sensor' page. The 'Sensor' dropdown menu is open, displaying a list of satellite sensors. 'AIP' is currently selected and highlighted in blue. The 'Display Indices' button is visible to the right of the dropdown. The page header and navigation elements are consistent with the previous slide.

## Index DataBase

A database for remote sensing indices

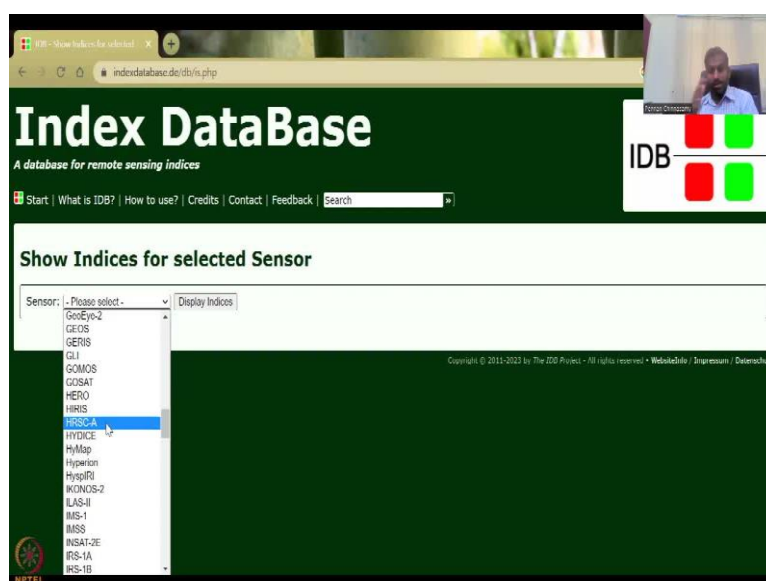
Start | What is IDB? | How to use? | Credits | Contact | Feedback | Search

### Show Indices for selected Sensor

Sensor: - Please select - | Display Indices

- Please select -
- AARIS
- AATSR
- ADAR
- AHS
- AIP**
- ANS
- ANSI
- ALI
- ALOS
- ANSAT-1
- AMSR
- ANIS-1
- ASAS
- ASD Field Spec
- ASTER
- AVHRR
- AVIRIS
- AVIS
- AVNIR

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This screenshot shows the 'Show Indices for selected Sensor' page with a different sensor selected. The 'Sensor' dropdown menu is open, and 'HRSC-A' is highlighted in blue. The 'Display Indices' button remains visible. The page layout and header are the same as in the previous slide.

## Index DataBase

A database for remote sensing indices

Start | What is IDB? | How to use? | Credits | Contact | Feedback | Search

### Show Indices for selected Sensor

Sensor: - Please select - | Display Indices

- Please select -
- GeoEye-2
- GEOS
- GERIS
- GLI
- GOMOS
- GOSSAT
- HERO
- HIRIS
- HRSC-A**
- HYDICE
- HyMap
- Hyperion
- HygIRI
- WORLDVISTA-2
- ILAS-II
- IMS-1
- INS
- INSAT-3E
- IRS-1A
- IRS-1B

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Index DataBase  
A database for remote sensing indices

Show Indices for selected Sensor  
Sentinel-2A

Select other Sensor:

Nr.	Name	Abbrev.	General formula	Specific formula	Calculated info
1	Adjusted transformed soil adjusted VI	ATSAVI	$\frac{(1 - \rho_{soil})}{(1 + \rho_{soil})} \left( \frac{1 - \rho_{veg}}{1 + \rho_{veg}} \right)$	$\frac{0.322}{1.104 - 0.501 \rho_{red}} \left( \frac{1 - \rho_{veg}}{1 + \rho_{veg}} \right)$	Automatic More
2	Aerial Free Vegetation Index 1600	AFV1600	$\frac{(R - 0.66) \cdot \rho_{NIR}}{0.101 + 0.418 \rho_{NIR}}$	$\frac{(0.8 - 0.66) \cdot \rho_{NIR}}{0.101 + 0.418 \rho_{NIR}}$	Automatic More
3	Aerial Free Vegetation Index 2100	AFV2100	$\frac{(R - 0.1) \cdot \rho_{NIR}}{0.101 + 0.418 \rho_{NIR}}$	$\frac{(0.8 - 0.1) \cdot \rho_{NIR}}{0.101 + 0.418 \rho_{NIR}}$	Automatic More
4	Aiteration		$\frac{(\rho_{NIR} - \rho_{red})}{(\rho_{NIR} + \rho_{red})}$	$\frac{0.11}{0.11}$	Automatic More
5	Atmospheric resistance index	ARI	$\frac{1 - \rho_{veg}}{1 + \rho_{veg}}$	$\frac{1 - \rho_{veg}}{1 + \rho_{veg}}$	Automatic More
6	Adjusted Vegetation Index	AVI	$\frac{(\rho_{NIR} - \rho_{red}) - \rho_{soil}}{(\rho_{NIR} + \rho_{red}) - \rho_{soil}}$	$\frac{0.60 - \rho_{soil}}{1.00 - \rho_{soil}}$	Automatic More
7	Atmospherically Resistant Vegetation Index	ARVI	$\frac{\rho_{NIR} - \rho_{red} - \rho_{soil}}{\rho_{NIR} + \rho_{red} - \rho_{soil}}$	$\frac{0.6 - \rho_{soil}}{1.0 - \rho_{soil}}$	Manual More
8	Atmospherically Resistant Vegetation Index 1976	ARVI2	$0.18 \frac{1 - \rho_{soil}}{1 + \rho_{soil}}$	$0.18 \frac{1 - \rho_{soil}}{1 + \rho_{soil}}$	Automatic More

230	Normalized Cap - Near Sash Index MSS	NSMSS	$\frac{(\rho_{NIR} - \rho_{red})}{(\rho_{NIR} + \rho_{red})} \left( \frac{1 - \rho_{veg}}{1 + \rho_{veg}} \right)$	$\frac{0.0761 - 0.1714 \cdot \rho_{red}}{1.0000 - 0.0000}$	Automatic More
231	Normalized Cap - Soil Brightness Index	SBMSS	$\frac{(\rho_{NIR} - \rho_{red})}{(\rho_{NIR} + \rho_{red})} \left( \frac{1 - \rho_{veg}}{1 + \rho_{veg}} \right)$	$\frac{0.4315 - 0.6014 \cdot \rho_{red}}{1.0000 - 0.0000}$	Automatic More
232	Normalized Cap - Vegetation	GV	$\frac{(\rho_{NIR} - \rho_{red})}{(\rho_{NIR} + \rho_{red})} \left( \frac{1 - \rho_{veg}}{1 + \rho_{veg}} \right)$	$\frac{0.7041 - 0.1614 \cdot \rho_{red}}{1.0000 - 0.0000}$	Automatic More
233	Normalized Cap - Wetness	WI	$\frac{(\rho_{NIR} - \rho_{red})}{(\rho_{NIR} + \rho_{red})} \left( \frac{1 - \rho_{veg}}{1 + \rho_{veg}} \right)$	$\frac{0.1200 - 0.4071 \cdot \rho_{red}}{1.0000 - 0.0000}$	Automatic More
234	Normalized Cap - Yellow Vegetation Index MSS	YVIMSS	$\frac{(\rho_{NIR} - \rho_{red})}{(\rho_{NIR} + \rho_{red})} \left( \frac{1 - \rho_{veg}}{1 + \rho_{veg}} \right)$	$\frac{0.0961 - 0.0201 \cdot \rho_{red}}{1.0000 - 0.0000}$	Automatic More
237	TCARI/OSAVI	TCARI/OSAVI	$\frac{(\rho_{NIR} - \rho_{red})}{(\rho_{NIR} + \rho_{red})} \left( \frac{1 - \rho_{veg}}{1 + \rho_{veg}} \right)$	$\frac{0.15 - 0.12 \cdot \rho_{red}}{1.0000 - 0.0000}$	Automatic More
238	Transformed Chlorophyll Absorption Index	TCARI	$\frac{(\rho_{NIR} - \rho_{red})}{(\rho_{NIR} + \rho_{red})} \left( \frac{1 - \rho_{veg}}{1 + \rho_{veg}} \right)$	$\frac{0.15 - 0.12 \cdot \rho_{red}}{1.0000 - 0.0000}$	Automatic More
239	Transformed NDVI	TNDVI	$\frac{(\rho_{NIR} - \rho_{red})}{(\rho_{NIR} + \rho_{red})} \left( \frac{1 - \rho_{veg}}{1 + \rho_{veg}} \right)$	$\frac{0.15 - 0.12 \cdot \rho_{red}}{1.0000 - 0.0000}$	Automatic More
240	Transformed Soil Adjusted Vegetation Index	TSAVI	$\frac{(\rho_{NIR} - \rho_{red})}{(\rho_{NIR} + \rho_{red})} \left( \frac{1 - \rho_{veg}}{1 + \rho_{veg}} \right)$	$\frac{0.15 - 0.12 \cdot \rho_{red}}{1.0000 - 0.0000}$	Automatic More
241	Transformed Soil Adjusted Vegetation Index 2	TSAVI2	$\frac{(\rho_{NIR} - \rho_{red})}{(\rho_{NIR} + \rho_{red})} \left( \frac{1 - \rho_{veg}}{1 + \rho_{veg}} \right)$	$\frac{0.15 - 0.12 \cdot \rho_{red}}{1.0000 - 0.0000}$	Automatic More
242	Transformed Vegetation Index	TVI	$\frac{(\rho_{NIR} - \rho_{red})}{(\rho_{NIR} + \rho_{red})} \left( \frac{1 - \rho_{veg}}{1 + \rho_{veg}} \right)$	$\frac{0.15 - 0.12 \cdot \rho_{red}}{1.0000 - 0.0000}$	Automatic More
243	Triangular chlorophyll index	TCI	$\frac{(\rho_{NIR} - \rho_{red})}{(\rho_{NIR} + \rho_{red})} \left( \frac{1 - \rho_{veg}}{1 + \rho_{veg}} \right)$	$\frac{0.15 - 0.12 \cdot \rho_{red}}{1.0000 - 0.0000}$	Automatic More
244	Vegetation Index 700	VI700	$\frac{(\rho_{NIR} - \rho_{red})}{(\rho_{NIR} + \rho_{red})} \left( \frac{1 - \rho_{veg}}{1 + \rho_{veg}} \right)$	$\frac{0.15 - 0.12 \cdot \rho_{red}}{1.0000 - 0.0000}$	Automatic More
245	Visible Atmospherically Resistant Index CIRES	VARIcires	$\frac{(\rho_{NIR} - \rho_{red})}{(\rho_{NIR} + \rho_{red})} \left( \frac{1 - \rho_{veg}}{1 + \rho_{veg}} \right)$	$\frac{0.15 - 0.12 \cdot \rho_{red}}{1.0000 - 0.0000}$	Automatic More
246	Visible Atmospherically Resistant Index J00	VARIJ00	$\frac{(\rho_{NIR} - \rho_{red})}{(\rho_{NIR} + \rho_{red})} \left( \frac{1 - \rho_{veg}}{1 + \rho_{veg}} \right)$	$\frac{0.15 - 0.12 \cdot \rho_{red}}{1.0000 - 0.0000}$	Automatic More
247	Visible Atmospherically Resistant Index RedEdge	VARIrededge	$\frac{(\rho_{NIR} - \rho_{red})}{(\rho_{NIR} + \rho_{red})} \left( \frac{1 - \rho_{veg}}{1 + \rho_{veg}} \right)$	$\frac{0.15 - 0.12 \cdot \rho_{red}}{1.0000 - 0.0000}$	Automatic More
248	Weighted Difference Vegetation Index	WDVI	$\frac{(\rho_{NIR} - \rho_{red})}{(\rho_{NIR} + \rho_{red})} \left( \frac{1 - \rho_{veg}}{1 + \rho_{veg}} \right)$	$\frac{0.15 - 0.12 \cdot \rho_{red}}{1.0000 - 0.0000}$	Automatic More
249	Wide Dynamic Range Vegetation Index	WDRVI	$\frac{(\rho_{NIR} - \rho_{red})}{(\rho_{NIR} + \rho_{red})} \left( \frac{1 - \rho_{veg}}{1 + \rho_{veg}} \right)$	$\frac{0.15 - 0.12 \cdot \rho_{red}}{1.0000 - 0.0000}$	Automatic More

So let us go to the start again and do one by one. So, if you can do the sensor, it will first give you all the sensors available here. So satellite is one and then there is a sensor. So satellite is the payload, so first steps are this the rocket is there, the rocket has the satellite in the nose part or somewhere in the body, it gets launched into space and then the satellite is put into orbit. Inside the satellite, there are sensors, there are cameras, and those are different-different sensors. So here we have different sensors, the mission is different, the sensor is different, but one mission can have multiple satellites, and multiple satellites can have multiple sensors. So one satellite need not have only one sensor, it can have multiple.

So, these are the exact sensors. So you have Sentinel 2A which is very-very famous. And if you can click on the indicators, you can see much much much more than 144 that we saw earlier is 250 and counting because of the high-high spatial resolution. 15-16 days is really

good, but more important here is the size, the spatial resolution. So 10 meters to 30 meter is a very good resolution, especially for developing nations like India, where the average land holding size is very small.

So think about your average landholding size, so at least you can have 10 pixels into to your dominant landholding size in India, which is very good to take out crop signatures, and very specific crop dynamics for development. So you have 144 in the Landsat one part where approximately here we have 249 and it is still getting updated.

(Refer Slide Time: 25:22)

**Index DataBase**  
A database for remote sensing indices

Start | What is IDB? | How to use? | Credits | Contact | Feedback | Search

### Show Indices for selected Sensor

Sentinel-2A

Select other Sensor:

Nr.	Name	Abbrev.	General Formula	Specific Formula	Calculated Info.
1	Adjusted transformed soil albedo index ATSAVI	ATSAVI	$\frac{1 - \rho_{soil}}{1 + \rho_{soil}}$	$\frac{1 - \rho_{soil}}{1 + \rho_{soil}}$	Automatic More
2	Aerosol free vegetation index 1000	MHI1000	$\frac{NIR - 0.68 \cdot \rho_{aer}}{NIR + 0.68 \cdot \rho_{aer}}$	$\frac{1 - 0.68 \cdot \rho_{aer}}{1 + 0.68 \cdot \rho_{aer}}$	Automatic More
3	Aerosol free vegetation index 2100	MHI2100	$\frac{NIR - 0.12 \cdot \rho_{aer}}{NIR + 0.12 \cdot \rho_{aer}}$	$\frac{1 - 0.12 \cdot \rho_{aer}}{1 + 0.12 \cdot \rho_{aer}}$	Automatic More
4	Alteration	ALTER	$\frac{\rho_{aer} - \rho_{veg}}{\rho_{veg}}$	$\frac{\rho_{aer} - \rho_{veg}}{\rho_{veg}}$	Automatic More
5	Arithmetic index of vegetation indices	AI	$\frac{\rho_{veg} - \rho_{aer}}{\rho_{veg} + \rho_{aer}}$	$\frac{\rho_{veg} - \rho_{aer}}{\rho_{veg} + \rho_{aer}}$	Automatic More
6	Atmospheric Vegetation Index	AVI	$\frac{1 - \rho_{veg} - \rho_{aer}}{1 + \rho_{veg} - \rho_{aer}}$	$\frac{1 - \rho_{veg} - \rho_{aer}}{1 + \rho_{veg} - \rho_{aer}}$	Automatic More
7	Atmospherically Resistant Vegetation Index	ARVI	$\frac{1 - \rho_{veg} - \rho_{aer}}{1 + \rho_{veg} - \rho_{aer}}$	$\frac{1 - \rho_{veg} - \rho_{aer}}{1 + \rho_{veg} - \rho_{aer}}$	Manual More
8	Atmospherically Resistant Vegetation Index 2200	ARVI2	$\frac{1 - \rho_{veg} - \rho_{aer}}{1 + \rho_{veg} - \rho_{aer}}$	$\frac{1 - \rho_{veg} - \rho_{aer}}{1 + \rho_{veg} - \rho_{aer}}$	Automatic More

69	Brightness Index	BI	$\frac{0.496(500-600) + 0.600(600-700) + 0.645(700-800) + 0.213(800-1100)}{0.496(500-600) + 0.600(600-700) + 0.645(700-800) + 0.213(800-1100)}$	$0.7257 \cdot 0.5974 + 0.2066 \cdot 0.2787$	
70	Mean Yellow Vegetation Index	MYVI	$0.7257(500-600) - 0.5974(600-700) + 0.2066(700-800) - 0.2787(800-1100)$		
71	Modified Simple Ratio	MSR	$\frac{\rho_{veg}}{\rho_{veg} - \rho_{aer}}$	$\frac{\rho_{veg}}{\rho_{veg} - \rho_{aer}}$	
72	Modified Normalized Difference Vegetation Index	MNDVI	$\frac{(530-570)^{(-1)} - 0.90(710)^{(-1)}}{(530-570)^{(-1)} + 0.90(710)^{(-1)}} \cdot NIR$	$(\rho^{(-1)} - \rho^{(-1)}) \cdot \rho$	
73	Modified Chlorophyll Absorption in Reflectance Index	MCIART	$\frac{((700nm - 670nm) \cdot 0.2(700nm - 550nm))}{(670nm)}$	$((\rho - \rho) \cdot 0.2(\rho - \rho)) \cdot \rho$	
74	Modified Chlorophyll Absorption in Reflectance Index 2	MCIART2	$1.2(2.5(600nm - 670nm) + 1.9(600nm - 550nm))$	$1.2(2.5(\rho - \rho) + 1.9(\rho - \rho))$	
75	Modified Chlorophyll Absorption in Reflectance Index 3	MCIART3	$\frac{(1.5 \cdot 2.5(600nm - 670nm) + 1.9(600nm - 550nm))}{\sqrt{(2000nm)^2 - 8000nm \cdot \rho_{veg} + 8000nm \cdot \rho_{aer}}}$	$\frac{(1.5 \cdot 2.5(\rho - \rho) + 1.9(\rho - \rho))}{\sqrt{(2000nm)^2 - 8000nm \cdot \rho_{veg} + 8000nm \cdot \rho_{aer}}}$	
76	Modified NDVI	MNDVI	$\frac{\rho_{veg} - \rho_{aer}}{\rho_{veg} + \rho_{aer}}$	$\frac{\rho_{veg} - \rho_{aer}}{\rho_{veg} + \rho_{aer}}$	
77	Modified Simple Ratio	MSR	$\frac{\rho_{veg}}{\rho_{veg} - \rho_{aer}}$	$\frac{\rho_{veg}}{\rho_{veg} - \rho_{aer}}$	
78	Modified Simple Ratio 6/0.800	MSR670	$\frac{\rho_{veg}}{\rho_{veg} - \rho_{aer}}$	$\frac{\rho_{veg}}{\rho_{veg} - \rho_{aer}}$	
79	Modified Simple Ratio 6/0.800	MSR670	$\frac{\rho_{veg}}{\rho_{veg} - \rho_{aer}}$	$\frac{\rho_{veg}}{\rho_{veg} - \rho_{aer}}$	
80	Modified Simple Ratio 6/0.800	MSR670	$\frac{\rho_{veg}}{\rho_{veg} - \rho_{aer}}$	$\frac{\rho_{veg}}{\rho_{veg} - \rho_{aer}}$	
81	Modified Soil Adjusted Vegetation Index	MSAVI	$2500 \cdot \frac{1 + \sqrt{(2500 + 1)^2 - 8(8000nm - 670nm)}}{2}$	$2511 \cdot \sqrt{(25 + 1)^2 - 8(8 - 1)}$	
82	Modified Soil Adjusted Vegetation Index	MSAVI2	$10.51 \cdot \frac{(2500nm + 1) + \sqrt{(2500nm + 1)^2 - 8(8000nm - 670nm)}}{2}$	$(0.5) \cdot ((25 + 1) + \sqrt{(25 + 1)^2 - 8(8 - 1)})$	

Index DataBase  
A database for remote sensing indices

Start | What is IDB? | How to use? | Credits | Contact | Feedback | Search

## Index DataBase

Today many different vegetation indices exists. But they haven't been arranged all together in one document and could not be selected by specific queries. An **Index-Data-Base (IDB)** could be an useful tool to find indices for a required application, adapted to a selected sensor.

On this site you find a database of **remote sensing indices** and **satellite sensors**. Available bands of sensors are linked with required wavelengths of indices, so that one can get all sensors usable for calculating an index and vice versa one can find all indices that can be calculated by data from a specific sensor. In the index formula wavelengths are substituted by corresponding sensor bands. Furthermore index and sensor data is enriched by applications and bibliographic references.

### Query the Database

- Show Indices for selected Sensor
- Show Indices for selected Application
- Show Indices for selected Sensor and Application
- Show Sensors for selected Index
- Show Sensors for selected Application
- Show Bands for selected Sensor
- Show Applications for selected Index
- Show Applications for selected Sensor

NPTEL

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A database for remote sensing indices

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## Index DataBase

### Show Indices for selected Application

Application: Please select - Display Indices

- Vegetation -
- Vegetation - Biomass
- Vegetation - Cellulose
- Vegetation - Chlorophyll
- Vegetation - Fluorescence
- Vegetation - LAI
- Vegetation - Lignin
- Vegetation - Nitrogen content
- Vegetation - Nitrogen stress
- Vegetation - PAR
- Vegetation - Protein
- Vegetation - Salinity stress
- Vegetation - Starch
- Vegetation - Stress
- Vegetation - Sugar
- Vegetation - Vitality
- Vegetation - Water
- Vegetation - Water stress
- Vegetation - Water use efficiency
- Water resource management

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NPTEL

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## Index DataBase

### Show Indices for selected Application

oil

Select other Application.

Id	Name	Formula/Variables/Comment
1	Simple NDVI 1142	(0.85)0.85
2	Simple NDVI 2110	(0.81)0.81
3	Simple NDVI 210	(0.8)0.8

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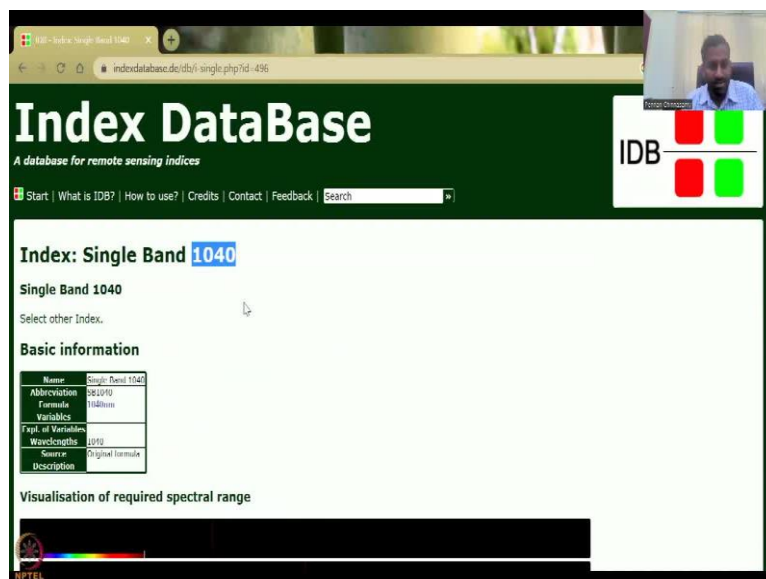
NPTEL



Let us also look at the NDVI in this one. How many NDVI, there is 32. And even if you do it by that is 18, or something 16 by plus 2, I am saying just in case. So at least some higher than the previous version. Why VI NDVI. So vegetation index is really very high. And you can see the modified M is there, which is different from what was there in the Landsat. This is because not only the resolution, but the sensors that are use is much different, the sensors that it could be a multispectral sensor or hyper-spectral sensor, or infrared band is added.

So we will go back, that is what sensor is. The second and third are really good. So second is very important for us application, what application do we want to use? Here you will see not only agriculture aspect of rural development, we will see multiple aspects say water management for domestic industrial water use in agricultural areas, water use efficiency for vegetation, all these are agriculture, oil availability, or how do you how do you sense oil from various indicators. So you can just take it from a band, there is no indicator, you just use in band, that is all it says.

(Refer Slide Time: 26:50)



The screenshot shows the Index DataBase website interface. The main heading is "Index DataBase" with the subtitle "A database for remote sensing indices". There is a navigation menu with links for "Start", "What is IDB?", "How to use?", "Credits", "Contact", and "Feedback", along with a search bar. The current page displays the details for the "Index: Single Band 1040". Below the title, there is a section for "Basic information" which includes a table with the following data:

Name	Single Band 1040
Abbreviation	SB1040
Formula	$\frac{R_{1040}}{R_{1040}}$
Variables	
Full of Variables	
Wavelengths	1040
Source	Original formula
Description	

Below the table, there is a section titled "Visualisation of required spectral range" which shows a spectral response curve for the index. The website also features a logo with four colored squares (red, green, red, green) and the acronym "IDB".

**Basic information**

Name	Single Band 1040
Abbreviation	S41010
Formula	1040nm
Variables	
Typ. of Variables	
Wavelengths	1040
Source	Original formula
Description	

**Visualisation of required spectral range**

**Sensors**

Nr.	Name	Spectral Range/Bands	Specific Formula	Calculated/Comment
1	AVIRIS	100 2200.7	199 256	Automatic
2	AVIRIS 2	100 2200.7	199 256	Automatic
3	AVIRIS	580-13000	6 12	Automatic
4	AVIRIS	520.42 4242	421 73	Automatic
5	Aerialis Systems A7-16	9-13000	17 18	Automatic
6	CASIS200	380 1200	489 170	Automatic
7	Da Vinci	9-13000	17 18	Automatic
8	GeoEye	140 2100	411 103	Automatic
9	IK1	175-17500	76 24	Automatic
10	IKON	100 12800	11 19	Automatic
11	IKON 2	100 2200	120 81	Automatic
12	IKON	475-2401.6	176 141	Automatic

**Applications**

Nr.	Name	Comment
1	Oil	
2	Vegetation	

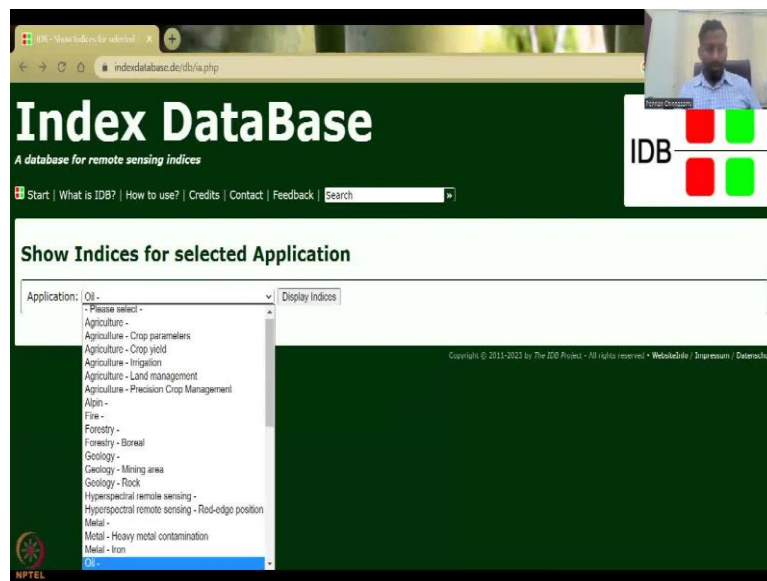
**References**

Nr.	Author/Title	Year/Comment
1	G. S. R. et al. - Remote sensing of foliar chemistry (1999)	

So when you click this band, you can also see which satellites are giving this band. So for example, I click the band for oil, it is a single band 1040 wavelength, so nanometers is wavelength, and then it says that all these sensors can give. So, now what you do go back to the sensor, and then extract that particular band for a while. So, indicator is a multiple bands, you put an algorithm you get an output. So NIR minus red, NIR plus red NDVI. But if one band is enough, so, you do not need all the bands or an indicator just use the man and that is what this article is saying 1040 is enough, and who gives 1040? All these sensors give to a 1014, so 24 indicators kind of say you can sync.

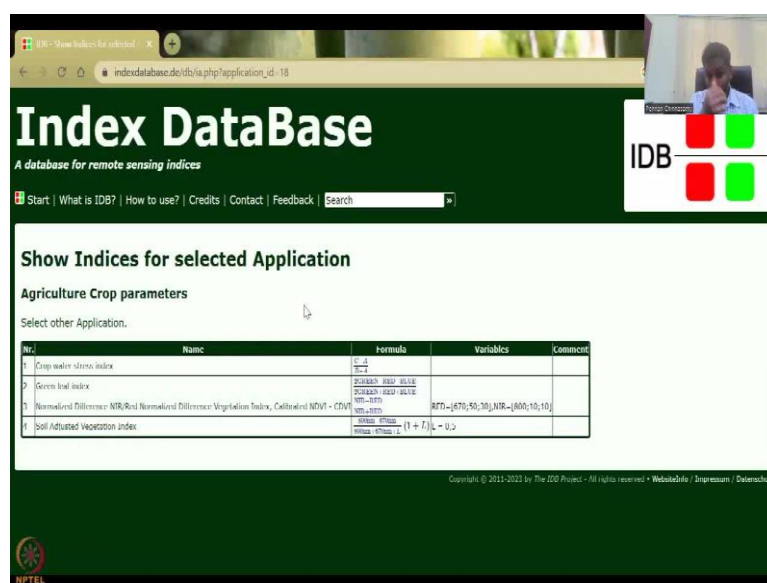


(Refer Slide Time: 27:38)



So, that is oil in terms of oil, and then you have the metal, metal, heavy metal contamination, metal iron, so, these also can help in associating the land quality and the health quality because if it has too much iron in the ground, and if it leaks into the water, then people when they drink it, they get really bad health issues. Especially you will see that in the rural areas with a lot of iron oxides present in the soil. And then we have hyper-spectral remote sensing and multispectral remote sensing, the geology, the ground type, the rock type is there. And then you have the forest what type of forest cover this is also linked to the tribals, livelihood options and biodiversity conservation like animals, birds, plants, herbs, medicinal plants, etc.

(Refer Slide Time: 28:30)



Index DataBase  
A database for remote sensing indices

Start | What is IDB? | How to use? | Credits | Contact | Feedback | Search

### Show Indices for selected Application

Application: Agriculture - Crop parameters

- Please select -
- Agriculture -
- Agriculture - Crop parameters
- Agriculture - Crop yield
- Agriculture - Irrigation
- Agriculture - Land management
- Agriculture - Precision Crop Management
- Alpin -
- Fire -
- Forestry -
- Forestry - Boreal
- Geology -
- Geology - Mining area
- Geology - Rock
- Hyperspectral remote sensing -
- Hyperspectral remote sensing - Red-edge position
- Metal -
- Metal - Heavy metal contamination
- Metal - Iron
- Oil -

Display Indices

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Index DataBase  
A database for remote sensing indices

Start | What is IDB? | How to use? | Credits | Contact | Feedback | Search

### Show Indices for selected Application

Agriculture Crop yield

Select other Application.

NR.	Name	Formula	Variables	Comment
1	Normalized Difference 800/680 Plant specific normalised difference (N.L. Lichtenthaler indices I, NDVI/hyper	$\frac{800 - 680}{800 + 680}$	800, 680	
2	Normalized Difference NIR/Red Normalized Difference - Vegetation Index, Cellulose NDVI - CDMI	$\frac{NIR - Red}{NIR + Red}$	RTN, (670;50;10), NIR, (800;10;10)	

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Index DataBase  
A database for remote sensing indices

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### Show Indices for selected Application

Application: Agriculture - Crop yield

- Please select -
- Agriculture -
- Agriculture - Crop parameters
- Agriculture - Crop yield
- Agriculture - Irrigation
- Agriculture - Land management
- Agriculture - Precision Crop Management
- Alpin -
- Fire -
- Forestry -
- Forestry - Boreal
- Geology -
- Geology - Mining area
- Geology - Rock
- Hyperspectral remote sensing -
- Hyperspectral remote sensing - Red-edge position
- Metal -
- Metal - Heavy metal contamination
- Metal - Iron
- Oil -

Display Indices

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The screenshot shows the Index DataBase (IDB) website interface. The main heading is "Index DataBase" with the subtitle "A database for remote sensing indices". Below this, there is a navigation menu with links for "Start", "What is IDB?", "How to use?", "Credits", "Contact", and "Feedback", along with a search bar. A video feed of a presenter is visible in the top right corner. The main content area is titled "Show Indices for selected Application" and "Agriculture Precision Crop Management". Below this, there is a table listing various indices.

No.	Name	Formula	Variables/Comment
1	Canopy Chlorophyll Content Index	$\frac{2.1R_{rs} - 5.0R_{rs} + 1.8R_{rs}}{1.0R_{rs} + 5.0R_{rs} - 0.2R_{rs}}$	
2	Crop water stress index	$\frac{R_{rs} - R_{rs}}{R_{rs} + R_{rs}}$	
3	Normalized Difference /90/0	$\frac{R_{rs} - R_{rs}}{R_{rs} + R_{rs}}$	
4	Normalized Difference: 750/750 Normalized difference: red edge index	$\frac{R_{rs} - R_{rs}}{R_{rs} + R_{rs}}$	

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So and then you have Alpin and then you have agriculture. So precision crop management, crop yield, crop irrigation. Let us look at the crop parameters, what indicators we have, we have the green leaf index, crop water stress, yes, for sure we have the NDVI calibrated and other NDVI's and then the Soil Adjusted Vegetation Index.

So you have a couple of indexes here, vegetation index is there but then there is a soil adjusted also. When you click it all the people who have done it will come since we have done a lot of crop parameters, let us go to crop yield and then if it is steady indicators, as we have used, NDVI has used a lot, if it is hyper NDVI, normal NDVI is there normal difference is the pigments specified is there, and then the normalized difference NDVI minus CDVI is also there.

So, you can use this to get at the area because if it is green in the healthy growing season, we assume that it is crops not only for us. So for example, in the Sangli region, most of the land is covered by sugarcane, I will not expect a forest to grow there unless otherwise it is a conservation area. So that is the agricultural crop yield. Irrigation land management, precision crop management, what indicators can be used is very-very specific the chlorophyll content because a healthy plant has high chlorophyll and then the drop water NDVI etc. etc. will come.

(Refer Slide Time: 30:07)

**Index DataBase**  
A database for remote sensing indices

Start | What is IDB? | How to use? | Credits | Contact | Feedback | Search

### Index Database

Today many different vegetation indices exists. But they haven't been arranged all together in one document and could not be selected by specific queries. An **Index-Data-Base (IDB)** could be a useful tool to find indices for a required application, adapted to a selected sensor.

On this site you find a database of **remote sensing indices** and **satellite sensors**. Available bands of sensors are linked with required wavelengths of indices, so that one can get all sensors usable for calculating an index and vice versa one can find all indices that can be calculated by data from a specific sensor. In the index formula wavelengths are substituted by corresponding sensor bands. Furthermore index and sensor data is enriched by applications and bibliographic references.

#### Query the Database

- Show Indices for selected Sensor
- Show Indices for selected Application
- Show Indices for selected Sensor and Application
- Show Sensors for selected Index
- Show Sensors for selected Application
- Show Bands for selected Sensor
- Show Applications for selected Index
- Show Applications for selected Sensor

**Index DataBase**  
A database for remote sensing indices

Start | What is IDB? | How to use? | Credits | Contact | Feedback | Search

### Show Indices for Application and Sensor

Sensor: Sentinel-2A  
Application: Agriculture - Crop parameters  
Display Indices

Nr.	Name	Abbrev.	General Formula	Specific Formula/Calculated
1	Green leaf index	GLI	$\frac{2 \times \text{NIR} - \text{Red}}{\text{NIR} + \text{Red}}$	$\frac{2 \times \text{SRV2} - \text{SRV4}}{\text{SRV2} + \text{SRV4}}$ Automatic
2	Normalized Difference NUI/Red Normalized Difference Vegetation index, Calibrated NUI	CDVI/NDVI	$\frac{\text{NIR} - \text{Red}}{\text{NIR} + \text{Red}}$	$\frac{\text{SRV2} - \text{SRV4}}{\text{SRV2} + \text{SRV4}}$ Automatic
3	Soil Adjusted Vegetation index	SAVI	$\frac{\text{NIR} - \text{Red}}{\text{NIR} + \text{Red} + 0.5}$	$\frac{\text{SRV2} - \text{SRV4}}{\text{SRV2} + \text{SRV4} + 0.5}$ Automatic

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Select other Index.

### Basic information

Name	Normalized Difference NUI/Red Normalized Difference Vegetation index, Calibrated NUI	CDVI
Abbreviation	NDVI	
Formula	$\frac{\text{NIR} - \text{Red}}{\text{NIR} + \text{Red}}$	
Variables	$\text{NIR} = [670; 850; 10; \text{NIR} = [660; 10; 10]]$	
Units of Variables	$\text{SRV} = \text{SRV} = \text{SRV} = 100 \text{ nm (nm } \mu\text{m)}$ and $\text{NUI} = \text{ca. } 0.0000$	
Wavelengths	$670; 850; 10; 660; 10; 10$	
Source	Original formula	
Description		

#### Visualisation of required spectral range

#### Sensors

Nr.	Name	Spectral Range	Bands	Specific Formula	Calculated/Comment
1	AIRS	478-511740	80	$\frac{\text{SRV} - \text{SRV}}{\text{SRV} + \text{SRV}}$	Automatic
2	AISA	100-2200.7	198	$\frac{\text{SRV} - \text{SRV}}{\text{SRV} + \text{SRV}}$	Automatic
3	AIR	478-7750	10	$\frac{\text{SRV} - \text{SRV}}{\text{SRV} + \text{SRV}}$	Automatic
4	AIRS	0-890	0	$\frac{\text{SRV} - \text{SRV}}{\text{SRV} + \text{SRV}}$	Automatic
5	AIRS-1	400-7500	105	$\frac{\text{SRV} - \text{SRV}}{\text{SRV} + \text{SRV}}$	Automatic
6	AIRS	400-1000	67	$\frac{\text{SRV} - \text{SRV}}{\text{SRV} + \text{SRV}}$	Automatic
7	AIRS	220-11000	22	$\frac{\text{SRV} - \text{SRV}}{\text{SRV} + \text{SRV}}$	Automatic

indexdatabase.de/ids/single.php?id=58

References

Nr.	Author / title	Year	Comment
1	Aventis, M., Villegas, D., Rayo, C., Cavallaro, L., Aroca, J. L. - Effect of sensor view angle on the assessment of agronomic traits by ground level hyper-spectral reflectance measurements in durum wheat under contrasting Mediterranean conditions	2024	
2	Barnes, A.; Murray, D.; Ross, F.; Harty, A. R. - A review of vegetation indices	1995	
3	Legendre, G. - Importance and limits of vegetation indices for LULU and APNU assessment	1991	
4	Berth, F.; Gayard, G.; Magné, D. - Crop biomass evaluation using satellite measurements	1989	
5	Bornes, E. M.; Clarke, L. J.; Richards, S. E.; Coluzzi, P. D.; Hoberford, J.; Kozłowski, M.; Waller, P.; Choi, C.; Kilev, E.; Thompson, J.; Luciano, R. J.; Li, H.; Moran, M. S. - Coincident detection of crop water stress, nitrogen status and canopy density using ground based multi-spectral data	2000	
6	Ignatov, S.; Wern, C. H.; Holden, G.; J. - Remote sensing for impacted horticulture: examples from research and possible applications	2000	
7	Becker, R.; Weiler, C. - Soil background effects on reflectance-based crop coefficients for corn	1993	
8	Becker, R.; Weiler, C.; Lindeman, W.; Justice, C. - A generalized regression based model for forecasting winter wheat yields in Kansas and Ukraine using MODIS data	2010	
9	Reynolds, W. B.; Coburn, T. - Comparing precision power and stability of broadband and hyperspectral vegetation indices for estimation of green leaf area index and canopy chlorophyll density	2003	
10	Ignatov, S.; Wern, C.; J. - Estimating error in the analysis of forest fragmentation change using North American Landscape Characterization (NALC) data	2003	
11	Reynolds, W. B.; Niles, S. G. - Silico-spectral model management: sensing requirements - what do we need to see?	2005	
12	Carlson, T. N.; Ripley, D. A. - On the relation between NDVI, fractional vegetation cover, and leaf area index	1997	
13	Carvalho, P.; Piro, S.; S. - Remote Sensing, Science, Technology, and Society: A Review of the State-of-the-Art in the Field of Remote Sensing and Its Applications in the Field of Remote Sensing	2001	
14	Vaccaro, P.; Coburn, T.; H. - Estimating error in the analysis of forest fragmentation change using North American Landscape Characterization (NALC) data: Part 1: theoretical approach	2004	
15	Chen, J. M. - Evaluation of vegetation indices and a modified simple ratio for boreal applications	1999	
16	Chen, J.; Shao, G.; B. - Remote Sensing and Monitoring the Environmental Impact of Mining in China Using Advanced Earth Observation Techniques - MIREO	2007	
17	Choudhury, G. S.; Choudhury, S. - Spectral reflectance, growth and chlorophyll relationships for rice crop in a semi arid region of India	1999	
18	Clarke, T. R.; Moran, M. S.; Barnes, E. M.; Piner, R. L.; Qi, J. - Remote sensing indices: a method for measuring a quality of a single component in heterogeneous pixels	2001	
19	Claverie, J. G.; W. - Application of a weighted infrared red vegetation index for estimating leaf area index by correcting for soil moisture	1999	
20	Cripps, R. H. F. - Calculating the vegetation index leaf area	1996	
21	Ignatov, S.; Wern, C.; J. - Identifying the spatial variability of soil constraints using multi year remote sensing	2011	
22	Becker, R.; Weiler, C. - The MFRS terrestrial chlorophyll index	2004	
23	Wern, C. - Remote Sensing of Water Content in Cereals Leaves	1999	
24	Wright, C. S. T.; Wallat, C. J.; Kim, M. S.; de Gooijer, F.; Barnes, E. M.; Harty, A. R. - Estimating Green Leaf Chlorophyll Concentration from Leaf and Canopy Reflectance	2000	
25	Vaccaro, P.; Coburn, T.; H. - Assessing the spatial distribution of forest fragmentation	2001	
26	Purvis, W. A.; P. - A review on reflectance-based and data assimilation techniques for enhanced agroecosystem modeling	2007	
27	Wern, C.; J. - Statistical derivation of RWI and LAI for irrigated cotton and rice in arid Uzbekistan by combining multi temporal Sentinel-1 data and ground measurements	2011	
28	Ignatov, S.; Wern, C.; J. - Using multi measurements to evaluate the new Vegetation & Stability series for prediction of wheat nitrogen status	2011	
29	Ignatov, S.; Wern, C.; J. - Remote sensing of carbon nitrogen status using the Canopy Chlorophyll	2011	

indexdatabase.de/ids/single.php?id=58

Applications

ID	Parameter	Value	Unit	Formula	Comment
51	PRDNDV1	430-950	5	NDVI - ND	Automatic
52	PRDNDV	190-1420	1	NDVI - ND	Automatic
53	QUICKBIOD	150-900	2	NDVI - ND	Automatic
54	RAZBIODV	190-850	2	NDVI - ND	Automatic
55	REPROVEAU	150-1400	6	NDVI - ND	Automatic
56	REPROV LULU	300-900	1	NDVI - ND	Automatic
57	RTSMACTIV	240-7300	14	NDVI - ND	Automatic
58	ScalWIFS	413-905	8	NDVI - ND	Automatic
59	ScalWIFS-2A	413-7280	13	NDVI - ND	Automatic
60	SFVIRI	560-14400	12	NDVI - ND	Automatic
61	SIS	150-900	2	NDVI - ND	Automatic
62	SROIT 1-1	500-890	4	NDVI - ND	Automatic
63	SROIT 1	300-1750	2	NDVI - ND	Automatic
64	SROIT 5	480-1750	5	NDVI - ND	Automatic
65	SROIT 6	150-890	2	NDVI - ND	Automatic
66	SROIT 7	450-890	5	NDVI - ND	Automatic
67	UK LPM 2	240-900	2	NDVI - ND	Automatic
68	VeRUS	190-820	12	NDVI - ND	Automatic
69	VTRIS	413-11350	22	NDVI - ND	Automatic
70	WorldView 2	190-1490	9	NDVI - ND	Automatic
71	WorldView-3	480-7365	20	NDVI - ND	Automatic

So I am going to go back to the start and then say that it is sensor and application. So how do you combine these two? Let us say I want the very latest, so Sentinel 1, Sentinel 2A, and then I will say what are the applications for that in crop parameters, and then display indices. So you have Greenleaf normal. So now we can club as a search as a query, I want both of them I only want Sentinel 2A and that where is it used for agriculture. So instead of going through all the crop parameters, I can go through this and then say, find what agricultural crop parameters Sentinel are available.

So you can see it, click the indicator, it has a formula, all the sensors that are being used. And then the applications where it can be applied and references. Here is where I feel they have to do more justice is to update these references, still its 2012 date, but again, these are done on



voluntary time and so, still what they have as data as links to the data is really-really impressive.

(Refer Slide Time: 31:16)

**Bands/Channels**

Nr.	Name	Short WL	MidWave WL	Full Sw. Rg.	Spat. Res.	Comment
1	1	413	443	453	30	0) Atmospheric correction (aerosol scattering)
2	2	638	690	722	60	0) Sensitive to vegetation senescence, carotenoid, browning, and soil background; atmospheric correction (aerosol scattering)
3	3	660	660	670	30	0) Green peak, sensitive to total chlorophyll in vegetation
4	4	680	680	680	30	0) Maximum chlorophyll absorption
5	5	690	705	713	15	0) Position of red edge; consolidation of atmospheric correction; 4 <sup>th</sup> fluorescence band
6	6	723	770	770	12	0) Position of red edge; atmospheric correction; retrieval of aerosol load
7	7	773	783	793	30	0) 4 <sup>th</sup> edge of the NIR plateau
8	8	862	872	898	112	0) 0.6
9	9a	865	865	875	30	0) NIR plateau; sensitive to total chlorophyll, biomass, LAI, and protein; water vapor absorption telemetry; retrieval of aerosol load and Lyr
10	10	920	910	920	40	0) Water vapor absorption; atmospheric correction
11	11b	1360	1375	1390	30	0) Position of thin cirrus for atmospheric correction
12	12a	1240	1610	1620	80	0) Sensitive to lignin, starch, and forest aboveground biomass; snows/cloud separation
13	13	2100	2100	2300	180	0) Assessment of Mediterranean vegetation conditions; detection of dry soils for the monitoring of soil cracking; detection of bare biomass, dead biomass, and soil (e.g. for burn scars mapping)

**Indices**

Nr.	Name	Specific Formula	Calculated/Comment
1	Adjusted Normalized Soil-Adjusted VI	$\frac{(1 - 0.165) \cdot (1 - 0.165) \cdot (1 - 0.165)}{(1 - 0.165) \cdot (1 - 0.165) \cdot (1 - 0.165)}$	Automatic
2	Aerosol free vegetation index 1600	$(1 - 0.04) \cdot \frac{(1 - 0.04)}{(1 - 0.04)}$	Automatic
3	Aerosol Free Vegetation Index 2100	$(1 - 0.2) \cdot \frac{(1 - 0.2)}{(1 - 0.2)}$	Automatic
4	absorption	$\frac{1}{1}$	Automatic
5	anthocyanin reflectance index	$\frac{1}{1}$	Automatic
6	anthocyanin vegetation index	$\frac{1}{1}$	In progress

**Indices**

1	Adjusted Normalized Soil-Adjusted VI	$\frac{(1 - 0.165) \cdot (1 - 0.165) \cdot (1 - 0.165)}{(1 - 0.165) \cdot (1 - 0.165) \cdot (1 - 0.165)}$	Automatic
2	Aerosol free vegetation index 1600	$(1 - 0.04) \cdot \frac{(1 - 0.04)}{(1 - 0.04)}$	Automatic
3	Aerosol Free Vegetation Index 2100	$(1 - 0.2) \cdot \frac{(1 - 0.2)}{(1 - 0.2)}$	Automatic
4	absorption	$\frac{1}{1}$	Automatic
5	anthocyanin reflectance index	$\frac{1}{1}$	Automatic
6	anthocyanin vegetation index	$\frac{1}{1}$	In progress
7	Adjusted Cap - brightness	$0.0093 \cdot 0.29955 + 0.2424 \cdot 0.4005 \cdot 0.4005 + 0.4005 \cdot 0.4005 \cdot 0.4005$	Automatic
8	Adjusted Cap - Green Vegetation Index MSS	$0.0021 \cdot 0.6601 + 0.2716 \cdot 0.2699$	Automatic
9	Adjusted Cap - New South Wales MSS	$0.0161 \cdot 0.1314 \cdot 0.4786 + 0.8875$	Automatic
10	Adjusted Cap - Soil brightness index MSS	$0.2322 \cdot 0.0021 + 0.0021 \cdot 0.2626 + 0.2626$	Automatic
11	Adjusted Cap - vegetation	$0.7660 \cdot 0.2485 \cdot 0.6484 \cdot 0.7748 + 0.0840 + 0.1809 + 1$	Automatic
12	Adjusted Cap - wetness	$0.1092 \cdot 0.2497 + 0.2297 + 0.2000 \cdot 0.2121 + 0.1572 + 1$	Automatic
13	Adjusted Cap - Yellow Vegetation Index MSS	$0.8991 \cdot 0.4736 + 0.8786 \cdot 0.8419$	Automatic
14	ICAW/OSWI	$\frac{(1 + 1) \cdot (1 + 1) \cdot (1 + 1)}{(1 + 1) \cdot (1 + 1) \cdot (1 + 1)}$	Automatic
15	Normalized Chlorophyll Absorption Ratio	$\frac{R((1 - 4) \cdot 0.7 \cdot 5 \cdot 1) \cdot (1)}{0.0000}$	Automatic
16	Transformed NDVI	$\frac{1 - 0.5}{1 + 0.5}$	Automatic
17	Transformed Soil Adjusted Vegetation Index	$\frac{0.1 \cdot 0.7 \cdot 0.1}{1 + 0.1 \cdot 0.1 \cdot 0.1}$	Automatic
18	transformed soil Adjusted Vegetation Index 2	$\frac{1 + 0.1 \cdot 0.1 \cdot 0.1}{1 + 0.1 \cdot 0.1 \cdot 0.1}$	Automatic
19	transformed Vegetation Index	$\sqrt{\frac{(1 + 0.1) \cdot 0.5}{1 + 0.1}}$	Automatic
20	Triangle chlorophyll index	$\frac{1}{2} \cdot (1 + 4) \cdot 0.5 \cdot (1 + 4) \cdot \frac{1}{2}$	Automatic
21	Vegetation Index 700	$\frac{1}{1}$	Automatic
22	Visible Atmospheric Resistant Index Green	$\frac{1}{1}$	Automatic
23	Visible Atmospheric Resistant Index 700	$\frac{1}{1}$	Automatic
24	Visible Atmospheric Resistant Index Rededge	$\frac{1}{1}$	Automatic
25	Weighted Difference Vegetation Index	$\frac{1}{1}$	Automatic
26	Wetness Dynamic Range Vegetation Index	$\frac{1}{1}$	Automatic

**Applications**

Nr.	Name
1	Agriculture
2	Agriculture - Crop parameters
3	Agriculture - Crop yield
4	Agriculture - Land management
5	Agriculture - Precision Crop Management
6	Fire
7	Forestry

indexdatabase.de/da/s\_single.php?id=96

23 Vegetation Water  
24 Vegetation - Water index

### References

No.	Author/Title	Year/Comment
1	Herrmann, L., Pimentel, A., Karmali, A., Cohen, Y., Alchanatis, V., Borfi, D. J. - UAV assessment of wheat and potato crops by Sentinel-2 and Sentinel-1 bands	2013
2	Röllin, K., Al-Ansari, C., Youso, T., White, B., Dal'Almeida, G. - Experimental assessment of the Sentinel-2 band setting for RTM-based LAI retrieval of sugar beet and maize 2009	

export bibliographic references as: bib/latex • RIS (Endnote) • CSV

### Visualisation of Indices

Sensor:

Indices:

Adjusted transformed soil adjusted vi

Aerosol free vegetation index 1600

Aerosol free vegetation index 2100

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Blue

Soil vegetation index

Infrared percentage vegetation index

Intensity

Inverse reflectance 220

Inverse reflectance 300

Latitude

NPTEL

indexdatabase.de/da/s\_single.php?id=96

Normalized Difference 820/1600

Normalized Difference 820/660

Normalized Difference 823/1619

Normalized Difference 833/658

Normalized Difference 860/1610

Normalized Difference 895/675

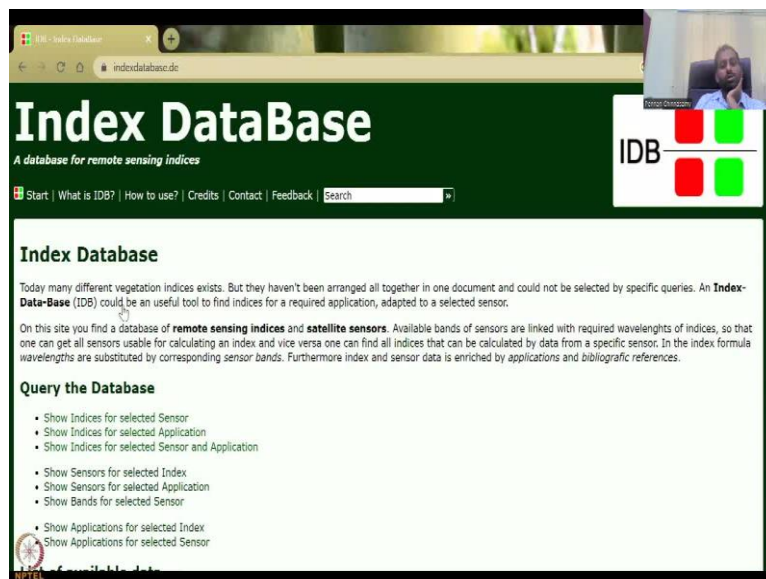
Normalized Difference Green/Red

Normalized Difference 884/885

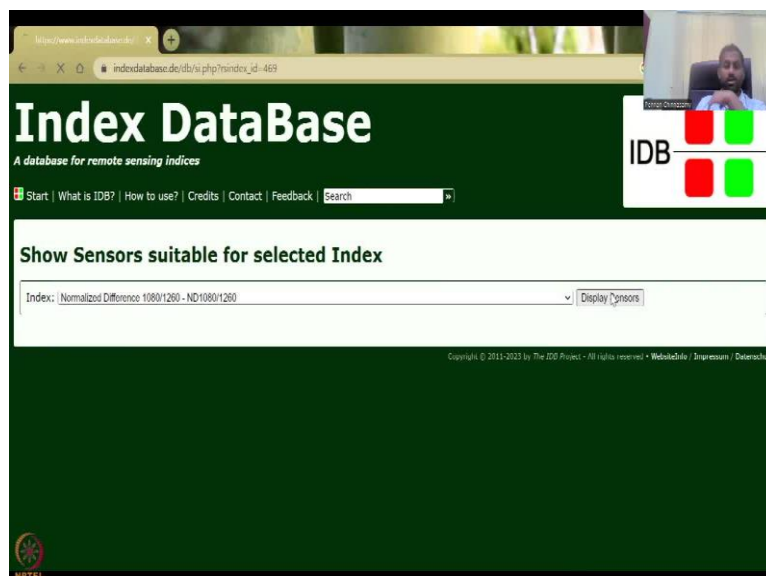
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So, I am going back to Sentinel 2A, you can say what are the channels what are the bands, so, there are 12 bands given as starting wavelength and middle wave, ending wave and so wavelength is arranged. So, if you say green color, it is range of colors and then these are the indicators that have been made using the Sentinel 2A, we saw that to be 249 which is the same here, applications, references etc. So, there stops in 2012 then later add. So, these are the different spectrums, the colors that are available in Sentinel 2A, which we can see here. So all the different types are here.

(Refer Slide Time: 32:03)



The screenshot shows the homepage of the Index DataBase (IDB) website. The browser address bar displays 'indexdatabase.de'. The page features a dark green header with the title 'Index DataBase' and the subtitle 'A database for remote sensing indices'. A navigation menu includes links for 'Start', 'What is IDB?', 'How to use?', 'Credits', 'Contact', and 'Feedback', along with a search bar. A small video feed in the top right corner shows a man speaking. The main content area contains an introductory paragraph about the database, a section titled 'Query the Database' with a list of search options, and an NPTEL logo at the bottom left.



The screenshot shows a search results page on the Index DataBase website. The browser address bar displays 'indexdatabase.de/index.php?index\_id=469'. The page features the same dark green header and navigation menu as the homepage. The main content area is titled 'Show Sensors suitable for selected Index'. A search bar contains the text 'Index: | Normalized Difference 1080/1260 - ND1080/1260' and a 'Display Sensors' button. A small video feed in the top right corner shows the same man speaking. The page footer includes a copyright notice: 'Copyright © 2011-2022 by The IDB Project - All rights reserved - WebMobile | Ingressum | DataSchule' and an NPTEL logo at the bottom left.



indexdatabase.de/ids/na.php?index\_id=469

# Index DataBase

A database for remote sensing indices

Start | What is IDB? | How to use? | Credits | Contact | Feedback | Search

## Show Sensors suitable for selected Index

Normalized Difference **1080/1260**

Select other Index.

Nr.	Name	Specific Formula	Bands	Spectrum [nm]	Spat.Res. [m]	Incl.	Platform	Operator	Info.
1	AVHRR	$\frac{B2 - B1}{B2 + B1}$	198	100-2100	0	0	airborne	Spicom Ltd.	More
2	ARIYS-1	$\frac{B1 - B2}{B1 + B2}$	108	400-1587	30	0	airborne	CSIRO and private industry	More
3	AVHRR	$\frac{B2 - B1}{B2 + B1}$	221	550-12-2215	20	0	airborne	NASA	More
4	TallMap	$\frac{B1 - B2}{B1 + B2}$	244	420-2450	30	0	airborne	PIR	More
5	HYDICE	$\frac{B1 - B2}{B1 + B2}$	210	100-2100	0	0	airborne	Naval Research Laboratories	More
6	HYDICE	$\frac{B1 - B2}{B1 + B2}$	210	100-2100	0	0	airborne	Naval Research Laboratories	More
7	Hyperspec	$\frac{B1 - B2}{B1 + B2}$	247	340-896-2587	30	0	TD-1	NASA	More
8	MERSI	$\frac{B1 - B2}{B1 + B2}$	0	680-2110	30000	0	satellite	ESA	More
9	Orthoview	$\frac{B1 - B2}{B1 + B2}$	200	450-2450	8	0	airborne	OrbFyn	More
10	SARISB00	$\frac{B1 - B2}{B1 + B2}$	100	550-2150	2.5	0	airborne	ILIRIS	More
11	VTRIS	$\frac{B1 - B2}{B1 + B2}$	272	415-11350	0	0	American NPP and NPPFSC/USA	More	

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indexdatabase.de/ids/na.php

# Index DataBase

A database for remote sensing indices

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## Show Sensors for selected Application

Application: Agriculture - Crop yield | Display Sensors

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indexdatabase.de/ids/na.php/application\_id=41

# Index DataBase

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## Show Sensors for selected Application

### Agriculture Crop yield

Select other Application.

Nr.	Name	Bands	Spectrum [nm]	Spat.Res. [m]	Incl.	Platform	Operator	Info.
1	AVHRR	30	128.5-231.00	1/8	0	airborne	Lockheed Enterprise Inc.	More
2	AVHRR	418	400-2106.7	0-0	0	airborne	Spicom Ltd.	More
3	AVHRR	10	122-2250	100-20	0	airborne	NASA	More
4	AVHRR	6	0-800	0-10	0	airborne	SARV's Earth Observation Research and Application Center (Japan)	More
5	AVHRR	192	100-2287	30-20	0	airborne	CSIRO and private industry	More
6	AVHRR	63	400-1670	0-0	0	airborne	NASA	More
7	AVHRR	12	240-2100	12-90	0	airborne	NASA	More
8	AVHRR	6	950-1700	1100-1100	0	airborne	NASA (National Oceanic and Atmospheric Administration)	More
9	AVHRR	241	550-12-2215	10-20	0	airborne	NASA	More
10	AVHRR	74	950-994	0-0	0	airborne	NASA	More
11	AVHRR	12	0-13000	0-0	0	airborne	Naval, Airborne Research and Survey Facility (AVSR)	More
12	AVHRR	288	100-1000	0-0	0	airborne	ILIRIS	More
13	AVHRR	96	101-105.5	1-6	0	airborne	TRIS Research Instruments	More
14	AVHRR	137	430-1536	175-17	0	airborne	TRIS Research Instruments	More
15	AVHRR	11	417-2068	0-0	0	airborne	TRIS Research Instruments	More
16	AVHRR	8	150-890	12/200	0	airborne	Brazil and China	More
17	AVHRR	63	400-1670	14-34	0	airborne	ESA	More
18	AVHRR	18	180-196	11-11	0	airborne	ESA	More
19	AVHRR	137	430-1536	175-17	0	airborne	ESA	More
20	AVHRR	6	122-2250	822-822	0	airborne	American Nimbus /	More
21	AVHRR	12	0-13000	0-0	0	airborne	FMF Energy Measurements Remote Sensing Laboratory (RS), Las Vegas, NV AND NRC Airborne Research and Survey Facility (AVSR)	More
22	AVHRR	76	400-1700	10-30	0	airborne	PIR	More

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## Show Sensors for selected Application

### Agriculture Crop yield

Select other Application.

Nr.	Name	Bands	Spectrum [nm]	Spot_Scs. [m]	Incl.	Platform	Operator	Info.
1	AMS	30	428.0-1317.0	7.8	0	airborne	Ubersat/enterprise inc.	More
2	ATSA	478	400-9366.7	0-0	0	airborne	Spectrum Ltd.	More
3	ALU	10	422-2250	10-20	0	EO 1	NASA	More
4	AIOS	6	0-800	0-10	98.2		NASA, Earth Observation Research and Application Center (Japan)	More
5	AVES 1	100	400-2287	20-30	0		CSIR and private industry	More
6	ASAS	67	400-1030	0-0	0			More
7	ASISB	12	520-11020	12-99	98.2		NASA	More
8	AVRR	6	560-17500	1100-1100	0	TIROS-N / NOAA / NITOP	NOAA (National Oceanic and Atmospheric Administration)	More
9	AVRUS	241	520-12-2512	40-20	0	airborne	NASA	More
10	AVRS	74	550-994	0-0	0			More
11	ASmuS systems ALU	12	0-10000	0-0	0	airborne	NERC Airborne Research and Survey Facility (AVRS)	More
12	AVRS 2.0	288	400-10000	0-0	0		LIRES	More
13	CASI spectral	96	391-905.5	3-8	0	airborne	TRPS Research Instruments	More
14	CASIS1000	288	380-1200	2.1-2.1	0	airborne	LIRES	More
15	CASI spectral	11	417-806	0-0	0	airborne	TRPS Research Instruments	More
16	LCRIS 1/CRIS 2	8	120-890	2.7-260	0		Israel and China	More
17	Chir-ProbaM1	63	400-1003	14-34	0	Proba	ESA	More
18	Chir-ProbaM1	18	180-796	17-17	0	Proba	ESA	More
19	Chir-ProbaM5	17	430-1036	17-17	0	Proba	ESA	More
20	CCCS	6	122-12500	824-824	0	American Nimbus /		More
21	Theravision	17	0-10000	0-0	0	airborne	FGAT Energy Measurements Remote Sensing Laboratory (RS), Las Vegas, NV AND NTRC Airborne Research and Survey Facility (AVRS)	More
22	AVRS-7015	70	400-17600	70-70	0	airborne, Do 728	TR	More
23	AVRS 2	5	420-900	0.5-0.5	98.13		Uopost Space	More
24	EarthEye	1	120-890	2-12	97	earth watch		More
25	AVRS 2	744	420-7450	10-30	0		TR	More
26	AVRS 2	12	120-890	2-8	0		National Space Organization (NSPO) of the Republic of China (Taiwan)	More
27	AVRS 2	5	420-900	0.5-0.5	98		GeoEye	More
28	AVRS 2	30	572-12200	220-1000	96.6		Advanced earth Observing Satellite 2 (ADEOS II)	More
29	AVRS 2	210	400-2200	0-0	0	airborne	Naval Research Laboratories	More
30	AVRS 2	138	420-5403.8	4-4	0	airborne		More
31	AVRS 2	212	319-896	20-30	0	EO 1	NASA	More
32	AVRS 2	5	140-900	0.82-2.2	98.1		GeoEye	More

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## Show Sensors for selected Application

### Agriculture Crop yield

Select other Application.

Nr.	Name	Bands	Spectrum [nm]	Spot_Scs. [m]	Incl.	Platform	Operator	Info.
1	AMS	30	428.0-1317.0	7.8	0	airborne	Ubersat/enterprise inc.	More
2	ATSA	478	400-9366.7	0-0	0	airborne	Spectrum Ltd.	More
3	ALU	10	422-2250	10-20	0	EO 1	NASA	More
4	AIOS	6	0-800	0-10	98.2		NASA, Earth Observation Research and Application Center (Japan)	More
5	AVES 1	100	400-2287	20-30	0		CSIR and private industry	More
6	ASAS	67	400-1030	0-0	0			More
7	ASISB	12	520-11020	12-99	98.2		NASA	More
8	AVRR	6	560-17500	1100-1100	0	TIROS-N / NOAA / NITOP	NOAA (National Oceanic and Atmospheric Administration)	More
9	AVRUS	241	520-12-2512	40-20	0	airborne	NASA	More
10	AVRS	74	550-994	0-0	0			More
11	ASmuS systems ALU	12	0-10000	0-0	0	airborne	NERC Airborne Research and Survey Facility (AVRS)	More
12	AVRS 2.0	288	400-10000	0-0	0		LIRES	More
13	CASI spectral	96	391-905.5	3-8	0	airborne	TRPS Research Instruments	More
14	CASIS1000	288	380-1200	2.1-2.1	0	airborne	LIRES	More
15	CASI spectral	11	417-806	0-0	0	airborne	TRPS Research Instruments	More
16	LCRIS 1/CRIS 2	8	120-890	2.7-260	0		Israel and China	More
17	Chir-ProbaM1	63	400-1003	14-34	0	Proba	ESA	More
18	Chir-ProbaM1	18	180-796	17-17	0	Proba	ESA	More
19	Chir-ProbaM5	17	430-1036	17-17	0	Proba	ESA	More
20	CCCS	6	122-12500	824-824	0	American Nimbus /		More
21	Theravision	17	0-10000	0-0	0	airborne	FGAT Energy Measurements Remote Sensing Laboratory (RS), Las Vegas, NV AND NTRC Airborne Research and Survey Facility (AVRS)	More
22	AVRS-7015	70	400-17600	70-70	0	airborne, Do 728	TR	More
23	AVRS 2	5	420-900	0.5-0.5	98.13		Uopost Space	More
24	EarthEye	1	120-890	2-12	97	earth watch		More
25	AVRS 2	744	420-7450	10-30	0		TR	More
26	AVRS 2	12	120-890	2-8	0		National Space Organization (NSPO) of the Republic of China (Taiwan)	More
27	AVRS 2	5	420-900	0.5-0.5	98		GeoEye	More
28	AVRS 2	30	572-12200	220-1000	96.6		Advanced earth Observing Satellite 2 (ADEOS II)	More
29	AVRS 2	210	400-2200	0-0	0	airborne	Naval Research Laboratories	More
30	AVRS 2	138	420-5403.8	4-4	0	airborne		More
31	AVRS 2	212	319-896	20-30	0	EO 1	NASA	More
32	AVRS 2	5	140-900	0.82-2.2	98.1		GeoEye	More

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## Show Sensors for selected Application

### Agriculture Crop yield

Select other Application.

Nr.	Name	Bands	Spectrum [nm]	Spot_Scs. [m]	Incl.	Platform	Operator	Info.
23	AVRS-7015	70	400-17600	70-70	0	airborne, Do 728	TR	More
24	AVRS 2	5	420-900	0.5-0.5	98.13		Uopost Space	More
25	EarthEye	1	120-890	2-12	97	earth watch		More
26	AVRS 2	744	420-7450	10-30	0		TR	More
27	AVRS 2	12	120-890	2-8	0		National Space Organization (NSPO) of the Republic of China (Taiwan)	More
28	AVRS 2	5	420-900	0.5-0.5	98		GeoEye	More
29	AVRS 2	30	572-12200	220-1000	96.6		Advanced earth Observing Satellite 2 (ADEOS II)	More
30	AVRS 2	210	400-2200	0-0	0	airborne	Naval Research Laboratories	More
31	AVRS 2	138	420-5403.8	4-4	0	airborne		More
32	AVRS 2	212	319-896	20-30	0	EO 1	NASA	More
33	AVRS 2	5	140-900	0.82-2.2	98.1		GeoEye	More
34	AVRS 2	6	560-17500	1000-8000	0		TRSO	More
35	AVRS 2	1	120-890	2-2	99.288			More
36	AVRS 2	4	400-800	75-75	99.028			More
37	AVRS 2	5	500-1700	2-8-70	98.12			More
38	AVRS 2	5	500-1700	5-8-70	98.13			More
39	AVRS 2	12	120-890	2-2	97			More
40	AVRS 2	16	400-14500	600-700	98.40			More
41	AVRS 2	0	0-900	1-1	0		KARI (Korea Aerospace Research Institute), South Korea	More
42	AVRS 2	8	400-17500	15-60	98.2		NASA / USGS	More
43	AVRS 2	4	500-1100	80-80	0		NASA	More
44	AVRS 2	7	400-17500	10-170	0		NASA / USGS	More
45	AVRS 2	7	400-17500	0-0	15			More
46	AVRS 2	1	520-900	20-20	97.2		NIS OMC, Russian Research Center for Earth Operative Monitoring	More
47	AVRS 2	6	500-17500	1000-1000	0		Russian Meteor-M satellites	More
48	AVRS 2	5	120-890	2-8	97		GeoEye	More
49	AVRS 2	500	400-2450	0-0	0		GeoEye	More
50	AVRS 2	211	400-2000-200	0-0	0		SIH, China	More
51	AVRS 2	5	420-900	0.5-0.5	0			More
52	AVRS 2	1	120-890	2-2	98		NSPO / NSPO 2	More
53	AVRS 2	5	450-900	0.6-3.4	97.2		GeoEye	More
54	AVRS 2	1	120-890	2-2	0		rapid eye NG	More
55	AVRS 2	6	400-1450	10-100	98		Russian 31	More
56	AVRS 2	1	200-900	1.2-1	98.2		NIS OMC, Russian Research Center for Earth Operative Monitoring	More

Index	Sensor	Resolution	Wavelength	Provider			
40	IRS-P1	10	405-1450	96.49			
41	Kompsat 2	0	0 900	1.1			
42	J-satellite (Landsat 2)	8	450-12500	15-40	0	Jasat	NASA / USGS
43	J-satellite (Landsat 3)	4	500-1100	80-80	0	Jasat	NASA
44	J-satellite (Landsat 4)	7	450-12500	10-170	0	Jasat	NASA / USGS
45	Monitor 1	7	450-2100	0-0	15		
46	Monitor 2	1	0 10 900	0 20	0 1 2		VIS DMG Russian Research Center for Earth Operative Monitoring
47	MSU-MR	6	500-12500	1000-1000	0	Russian Meteor-M satellites	Russia
48	OrbView 1	0	100 900	1 8	0 1 7	Orbital Sciences	Canada
49	OrbView 4	100	450-5450	6-8	0		GenFyn
50	SPH	111	100 2000 20	0 0	0		SHP China
51	Precisio-1	5	410-950	0.5-2	0		
52	PROBA-V	11	110 2032	0 0	0 0	SPOU 4, SPOU 2	European Space Agency
53	QuickBird	5	450-900	0.6-2.4	0 2 2	WorldView	GenFyn
54	WorldView	0	110 820	0 2	0		WorldView NG
55	Rosmos-1	6	450-1450	10-100	0 8	Rosmos-1	
56	Vegetation DMG	1	200 800	1 2 2	0 9 0		VIS DMG Russian Research Center for Earth Operative Monitoring
57	SCIAMACHY	15	240-2180	0 0 0 0 0	0	TIROSAT	ESA
58	Satellite	8	412-905	0-0	0	Satellite/OrbView-2	GenFyn
59	Sentinel 2A	10	110 2200	0 0 0	0 0 0		ESA
60	SPOT 1	17	600-1400	1000-1000	0	MSG (Advanced Second Generation)	
61	SIS	0	150 900	1 1	0 8	Sopac (Imaging)	
62	SPOT 1-3	4	500-900	10-70	0	SPOT	
63	SPOT 4	0	200 1120	10 20	0	SPOT	
64	SPOT 5	5	400-1250	0.5-20	0 6 7	SPOT	CNES (Centre National d'Etudes Spatiales)
65	SPOT 6	0	150 900	1 2 0	0 9 2	AstroSat 200	CSRS (Centre National of Studies Spatiales)
66	SPOT 7	5	450-900	1.5-4	0 6 2	AstroSat-500	
67	UK DMG 2	0	200 900	22 22	0		British Survey Satellite Technology Limited (SS) Ltd, UK
68	VIIRS	17	400-200	0-0	0		
69	VIIRS	22	112 13320	0 0	0	American NPP and NPDS	USA
70	WorldView-2	0	400-1040	0.46-0.52	0		
71	WorldView 2	29	100 2200	0 31 20	0		

So I will go back to now this part show sensor for selected index. So you can select an index and see what the sensor is available, NDVI, hyper NDVI, so as I said, we already know this because we went to NDVI just NDVI and then we selected the sensor. So these are sensors that give this particular 1080 to 60 NDVI. Then we have show sensors for selected application and then show bands for search terms. So here it is, in the indicators, what are the indicators for the applications here what is the sensor, I am not going to talk about the indicator says let us say what are the sensors that are giving these data? So these are the sensors.

So these are the basic base sensors that are collecting the data and then giving it to you, you do the indicators and then assess the benefits. The operators are here you have NASA for example CSIRO, the Australian company and then you have the ESA, the European Space Space Agency, and then gold eye, geo eye, so etc. are all private and government partnerships etc. So, you have the central nationally tourists specialists CNES, British survey these are part of the ESA also, and the USA for sure the NASA.

(Refer Slide Time: 33:38)

Nr.	Name	Start Wl	Middle Wl	End Wl	Spa	Res	Comment
1	atmospheric correction (aerosol scattering)	650	670	680	30	10	
2	green peak; sensitive to total chlorophyll in vegetation	410	440	470	10	10	
3	maximum chlorophyll absorption	660	680	700	10	10	
4	red edge; combination of atmospheric corrections and fluorescence baseline	710	740	780	10	10	
5	blue edge; atmospheric correction; retrieval of aerosol load	410	440	470	10	10	
6	LULU edge of the Nix plateau	650	670	680	10	10	
7	LULU at	650	670	680	10	10	
8	Nix plateau; sensitive to total chlorophyll, biomass, LAI, and protein, water vapor absorption reference; retrieval of aerosol load and type	650	670	680	10	10	
9	Nix plateau	650	670	680	10	10	
10	selection of thin cirrus for atmospheric correction	1100	1150	1200	20	10	
11	biomass; retrieval of above-ground biomass; assessment of soil erosion; distinction of clay soils for the monitoring of soil erosion; distinction between live biomass, dead biomass, and soil (only for biomass energy)	1600	1650	1700	10	10	



indexdatabase.de/idb/ai.php

# Index DataBase

A database for remote sensing indices

Start | What is IDB? | How to use? | Credits | Contact | Feedback | Search

Index: - Please select -

- Norm NIR - Norm NIR
- Norm R - Norm R
- Normalized Difference 10701200 NDWI-Hyperion - NDWI-Hyp
- Normalized Difference 10801180 - ND10801180
- Normalized Difference 10801260 - ND10801260
- Normalized Difference 10801450 - ND10801450
- Normalized Difference 10801675 - ND10801675
- Normalized Difference 10802170 - ND10802170
- Normalized Difference 10941205 Leaf water VI 2 - LWV-2
- Normalized Difference 1094983 Leaf water VI 1 - LWV-1
- Normalized Difference 11801450 - ND11801450
- Normalized Difference 11801675 - ND11801675
- Normalized Difference 11802170 - ND11802170
- Normalized Difference 12801450 - ND12801450
- Normalized Difference 12801675 - ND12801675
- Normalized Difference 12802170 - ND12802170
- Normalized Difference 1510660 NRI1510 - ND1510660
- Normalized Difference 21001500 Normalized Difference leaf canopy biomass - NDleaf
- Normalized Difference 22601490 Normalized Difference leaf mass per area - NDlma
- Normalized Difference 415435 Normalized Photochemical Index - Normalized difference pigment index NDPI - NPOI

Display Applications

indexdatabase.de/idb/ai.php

# Index DataBase

A database for remote sensing indices

Start | What is IDB? | How to use? | Credits | Contact | Feedback | Search

Index: - Please select -

- Normalized Difference 774677 - ND774677
- Normalized Difference 780550 Green NDVI hyper - GNDVhyper
- Normalized Difference 782329 G21 G22 G23
- Normalized Difference 790870 - ND790870
- Normalized Difference 790720 Normalized difference red edge index - NDRE
- Normalized Difference 8001180 - ND8001180
- Normalized Difference 8001260 - ND8001260
- Normalized Difference 8001450 - ND8001450
- Normalized Difference 8001675 - ND8001675
- Normalized Difference 8002170 - ND8002170
- Normalized Difference 800470 Pigment specific normalised difference C2 - PSNDc2
- Normalized Difference 800500 Pigment specific normalised difference C1 - PSNDc1
- Normalized Difference 800550 Green NDVI hyper 2 - GNDVhyper2
- Normalized Difference 800630 Pigment specific normalised difference B2 - PSNDb2
- Normalized Difference 800650 Pigment specific normalised difference B1 - PSNDb1
- Normalized Difference 800675 Pigment specific normalised difference A1 - PSNDa1
- Normalized Difference 800680 Pigment specific normalised difference A2 - PSNDa2
- Normalized Difference 8191600 NDII - NDII
- Normalized Difference 8191648 NDII 2 - NDII2
- Normalized Difference 8201000 Normalized Difference Moisture Index - NDMI

Display Applications

indexdatabase.de/idb/ai.php

# Index DataBase

A database for remote sensing indices

Start | What is IDB? | How to use? | Credits | Contact | Feedback | Search

Index: - Please select -

- Normalized Difference 8571241 Normalized Difference Water Index - NDWI2
- Normalized Difference 8601240 Normalized Difference Water Index - NDWI
- Normalized Difference 8601640 - SWIS
- Normalized Difference 885875 - ND885875
- Normalized Difference 900680 - ND900680
- Normalized Difference 905710 Normalized Difference Chlorophyll - NDchl
- Normalized Difference 9601180 - ND9601180
- Normalized Difference 9601260 - ND9601260
- Normalized Difference 9601450 - ND9601450
- Normalized Difference 9601675 - ND9601675
- Normalized Difference 9602170 - ND9602170
- Normalized Difference GreenRed Normalized green red difference index, Visible Atmospherically Resistant Indices Green (Vgreen) - NGRDI
- Normalized Difference Lignin Index - NDLI
- Normalized Difference MIRNIR Normalized Difference Vegetation Index (in case of strong atmospheric disturbances) - NDVI
- Normalized Difference NIRBlue Blue-normalized difference vegetation index - BNDVI
- Normalized Difference NIRGreen Green NDVI - GNDVI
- Normalized Difference NIRMIR Modified Normalized Difference Vegetation Index - MNDVI
- Normalized Difference NIRRed Normalized Difference Vegetation Index, Calibrated NDVI - CDVI - NDVI
- Normalized Difference NIRRedEdge Normalized Difference Red-Edge - NDRE
- Normalized Difference NIRSWIR Normalized Burn Ratio - NBR

Display Applications

Index DataBase  
A database for remote sensing indices

Start | What is IDB? | How to use? | Credits | Contact | Feedback | Search

### Show Applications for selected Index

Index: - Please select -

- Normalized Difference 800/1012 - ND800/1012
- Normalized Difference 860/2170 - ND860/2170
- Normalized Difference GreenRed Normalized green red difference index, Visible Atmospherically Resistant Indices Green (VIgreen) - NGFDI
- Normalized Difference Ligin Index - NDLI
- Normalized Difference MIR/NIR Normalized Difference Vegetation Index (in case of strong atmospheric disturbances) - NDVI
- Normalized Difference NIR/Blue Blue-normalized difference vegetation index - BNDVI
- Normalized Difference NIR/Green Green NDVI - GNDVI
- Normalized Difference NIR/MIR Modified Normalized Difference Vegetation Index - MNDVI
- Normalized Difference NIR/Red Normalized Difference Vegetation Index, Calibrated NDVI - CDVI - NDVI
- Normalized Difference NIR/RedEdge Normalized Difference Red-Edge - NDRE
- Normalized Difference NIR/SWIR Normalized Burn Ratio - NBR
- Normalized Difference Nitrogen Index - NDI
- Normalized Difference Red/Green Redness Index - RI
- Normalized Difference RedEdge/Red - NDVI rededge
- Normalized Difference Salinity Index - NDSI
- Normalized Difference Vegetation Index 800-710 - NDVI800-710
- Normalized Difference Vegetation Index C - NDVIc
- Optimized Soil Adjusted Vegetation Index - CSAVI
- Optimized Soil Adjusted Vegetation Index 1510 - CSAVI1510
- Optimized Soil Adjusted Vegetation Index 2 - CSAVI2

Display Applications

Index DataBase  
A database for remote sensing indices

Start | What is IDB? | How to use? | Credits | Contact | Feedback | Search

### Show Applications for selected Index

Index: - Please select -

- Modified Simple Ratio 705/445 - MSR705/445
- Modified Simple Ratio NIR/RED - MSR/NIR/Red
- Modified Soil Adjusted Vegetation Index - MSAVI
- Modified Soil Adjusted Vegetation Index hyper - MSAV/hyper
- Modified Triangular Vegetation Index 1 - MTV1
- Modified Triangular Vegetation Index 2 - MTV2
- Modifies NLI - MNLJ
- mSKZ - mSKZ
- Muscovite
- new Double Difference Index - DDn
- Nonlinear vegetation index - NLJ
- Norm G - Norm G
- Norm NIR - Norm NIR
- Norm H - Norm H
- Normalized Difference 1070/1200 NDWI-Hyperion - NDWI-Hyp
- Normalized Difference 1080/1180 - ND1080/1180
- Normalized Difference 1080/1260 - ND1080/1260
- Normalized Difference 1080/1450 - ND1080/1450
- Normalized Difference 1080/1675 - ND1080/1675
- Normalized Difference 1080/2170 - ND1080/2170

Display Applications

Index DataBase  
A database for remote sensing indices

Start | What is IDB? | How to use? | Credits | Contact | Feedback | Search

### Show Applications for selected Index

**Normalized Difference 1180/2170**

Select other Index.

No results for the selected combination.

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The screenshot shows the Index DataBase website interface. The header includes the title 'Index DataBase' and the subtitle 'A database for remote sensing indices'. A navigation menu contains links for 'Start', 'What is IDB?', 'How to use?', 'Credits', 'Contact', and 'Feedback', along with a search bar. A video feed of a presenter is visible in the top right corner. The main content area displays the title 'Show Applications for selected Index' and the selected index: 'Normalized Difference 860/1240 Normalized Difference Water Index'. Below this, there is a 'Select other Index.' section with a table:

Nr.	Name	Comment
1	Vegetation	NDVI
2	Vegetation	NDWI

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The screenshot shows the Index DataBase website interface. The header includes the title 'Index DataBase' and the subtitle 'A database for remote sensing indices'. A navigation menu contains links for 'Start', 'What is IDB?', 'How to use?', 'Credits', 'Contact', and 'Feedback', along with a search bar. A video feed of a presenter is visible in the top right corner. The main content area displays the title 'Show Applications for selected Index' and the selected index: 'Normalized Difference NIR/Green Green NDVI'. Below this, there is a 'Select other Index.' section with a table:

Nr.	Name	Comment
1	Vegetation	Chlorophyll
2	Vegetation	Chlorophyll

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So then we go to bands for selector sensor what is the bands that are available as we do not know sometimes we have to search so for example, we did search for Sentinel in the previous lecture just to make sure that we are in the correct domain. And here are the bands, so it has around 13 bands, 8, 8 a, etc. 8 is around the NAI region and it gives you the colors of these bands where the bands are coming which is visible plus the near infrared or VNIR we do have some sensors for that. So we have all these and then we have show applications for selected index or show applications for selected sensor, index we can do. We can say again NDVI modified NDVI is there and just the normalized vegetation difference index NDVI. We have the NDWI reference Water Index, and then all the NDVI's are here.

Pan NDVI, PNDVI optimized, so you can just choose a particular NDVI and then see if it actually works along, so let us say I am going to choose this one display the applications

where can be applied. No, do a random search for another one. We do not know that NDVI, NDWI, we know the applications, vegetation and water. So it picks up again, the, I do not see it getting updated from 2012, which is okay, at least this part, you can get it from literature, surveys and stuff. So all these NDVI's are getting really good applications, G NDVI is for vegetation and chlorophyll, you can get that information also.

(Refer Slide Time: 35:26)

The screenshot shows the 'Index DataBase' website. The header includes the title 'Index DataBase' and the subtitle 'A database for remote sensing indices'. Below the header, there is a navigation menu with links for 'Start', 'What is IDB?', 'How to use?', 'Credits', 'Contact', and 'Feedback'. A search bar is also present. The main content area is titled 'List of available Indices' and includes a sorting option: 'Order by: Name [^][v] • Abbreviation [^][v] • Applications [^][v] • Sensors [^][v] • References [^][v]'. The page is identified as 'Page 1 of 2 [1] [2] > > >'. A table lists various indices with columns for 'Nr', 'Name', 'Abbrev.', 'Formula', 'Variables', 'Source', '#', '#', and '#'. The table contains 10 rows of data, including indices like 'Adjusted Inherent soil-adjusted VI', 'Aerosol free vegetation index 1600', and 'Aerosol free vegetation index 2100'.

The screenshot shows a detailed view of the 'Index DataBase' website, specifically a list of sample ratios. The table has columns for 'Nr', 'Name', 'Abbrev.', 'Formula', 'Variables', 'Source', '#', '#', and '#'. The list includes 20 entries, all of which are 'Sample Ratio' indices. The 'Name' column contains identifiers such as 'SR1360/1370', 'SR1450/1080', 'SR1450/1180', 'SR1450/1360', 'SR1450/160', 'MS12', 'MS1', 'TH45/TH7', 'DSW-2', 'DSW-1', 'SR1675/1080', 'SR1675/1180', 'SR1675/1360', 'SR1675/160', 'SR1710/1080', 'SR1710/1180', 'SR1710/1360', and 'SR1710/160'. The 'Source' column for all entries is 'Original Formula'. The table is identified as 'Page 1 of 2 [1] [2] > > >'. At the bottom, there is a copyright notice: 'Copyright © 2011-2021 by the IIR project. All rights reserved • Webadmin / Impressum / Datenschutz'.



Index ID	Index Name	Formula	References	Original Formula	Band 1	Band 2	Band 3
504	Transformed NDVI	$\frac{NDVI - 0.5}{1 - 0.5}$	7, 11	Original Formula	0.7	4	14
505	Transformed Soil Adjusted Vegetation Index	$\frac{1 - NDVI}{1 + NDVI} + \frac{1 - NDVI}{1 + NDVI}$		Original Formula	0.7	1	4
506	Transformed Soil Adjusted Vegetation Index 2	$\frac{1 - NDVI}{1 + NDVI} + \frac{1 - NDVI}{1 + NDVI}$		Original Formula	0.7	1	4
507	Transformed Vegetation Index	$\sqrt{NDVI^2 + 0.5}$		Original Formula	0.5	1	2
508	Triangle chlorophyll index	$\frac{1.25 \sqrt{TM_{11} - TM_{12}}}{TM_{11} + TM_{12}}$		Original Formula	1.0	2	1
509	Triangle greenness index	$\frac{TM_{11} - TM_{12}}{TM_{11} + TM_{12}}$		Original Formula	4	0	1
510	Triangle Vegetation Index	$\frac{TM_{11} - TM_{12}}{TM_{11} + TM_{12}}$		Original Formula	1.3	2	8
511	Vegetation Condition Index	$\frac{TM_{11} - TM_{12}}{TM_{11} + TM_{12}}$		Original Formula	0	2	0
512	Vegetation Index 700	$\frac{TM_{11} - TM_{12}}{TM_{11} + TM_{12}}$		Original Formula	1.8	0	1
513	Visible Atmospherically Resistant Index Green	$\frac{TM_{11} - TM_{12}}{TM_{11} + TM_{12}}$		Original Formula	0.7	0	4
514	Visible Atmospherically Resistant Index 700	$\frac{TM_{11} - TM_{12}}{TM_{11} + TM_{12}}$		Original Formula	1.1	0	2
515	Visible Atmospherically Resistant Index RedEdge	$\frac{TM_{11} - TM_{12}}{TM_{11} + TM_{12}}$		Original Formula	4.1	2	1
516	Weighted Difference Vegetation Index	$\frac{TM_{11} - TM_{12}}{TM_{11} + TM_{12}}$		Original Formula	0.7	1	11
517	WT/NDVI	$\frac{TM_{11} - TM_{12}}{TM_{11} + TM_{12}}$		Original Formula	1.5	2	1
128	Wide Dynamic Range Vegetation Index	$\frac{TM_{11} - TM_{12}}{TM_{11} + TM_{12}}$		Original Formula	0.7	2	1
519	Wetness Index	$\frac{TM_{11} - TM_{12}}{TM_{11} + TM_{12}}$		Original Formula	0	0	1

So these are the show applications by index, show application by sensor, list of data available, indices available references, indices is this list that we had, and you can look at how many sensors indicators are there, all these are driven by remote sensing indicators, we have 300, I would say 300 plus, let us see how big it is. Yes around 590 indicators, and all of them driven by remote sensing. So if you want to use these indicators, if you know someone has told about an indicator for rural development, can directly come here, look at the formula, click on the indicator, it will take you to the references, go back and then get it. So the most important is the formula, how to do it? We have already done it in class using that pasture calculator.

(Refer Slide Time: 36:20)

**Query the Database**

- Show Indices for selected Sensor
- Show Indices for selected Application
- Show Indices for selected Sensor and Application
- Show Sensors for selected Index
- Show Sensors for selected Application
- Show Bands for selected Sensor
- Show Applications for selected Index
- Show Applications for selected Sensor

**List of available data**

- List of available Indices
- List of available Sensors
- List of available Applications
- List of References
- Visualisation of Sensor Bands
- Visualisation of required Index Wavelengths

**Your feedback**

- Submit your suggestions

**JSON-API**

If you want to use the data for Webservices, you can use the JSON-API. In order to get access to the API, please contact us.

indexdatabase.de/db/r.php

# Index DataBase

A database for remote sensing indices

Start | What is IDB? | How to use? | Credits | Contact | Feedback | Search

## List of References

Order by: Author [^][v] • Title [^][v] • Year [^][v] • Journal [^][v] • Indices [^][v] • Sensors [^][v] • Applications [^][v]

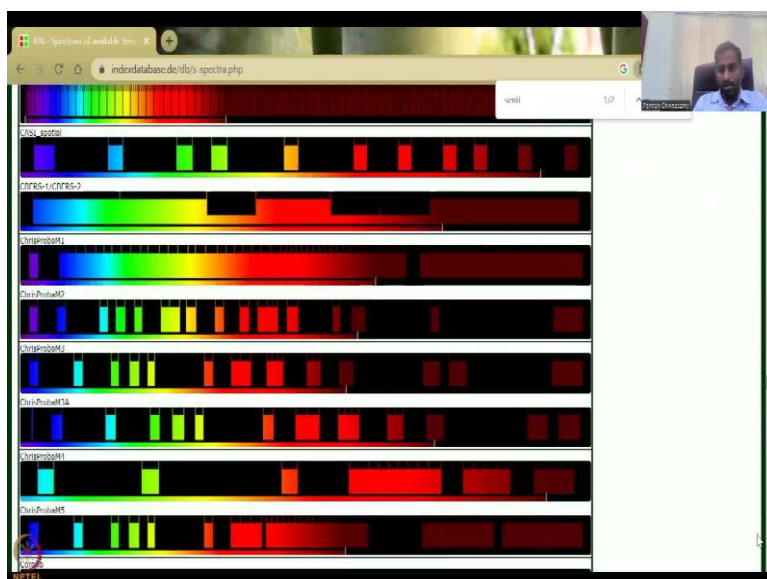
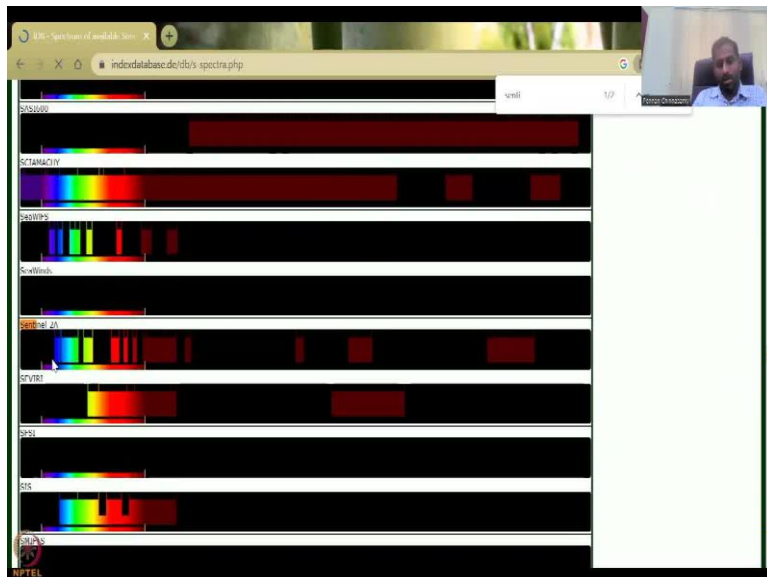
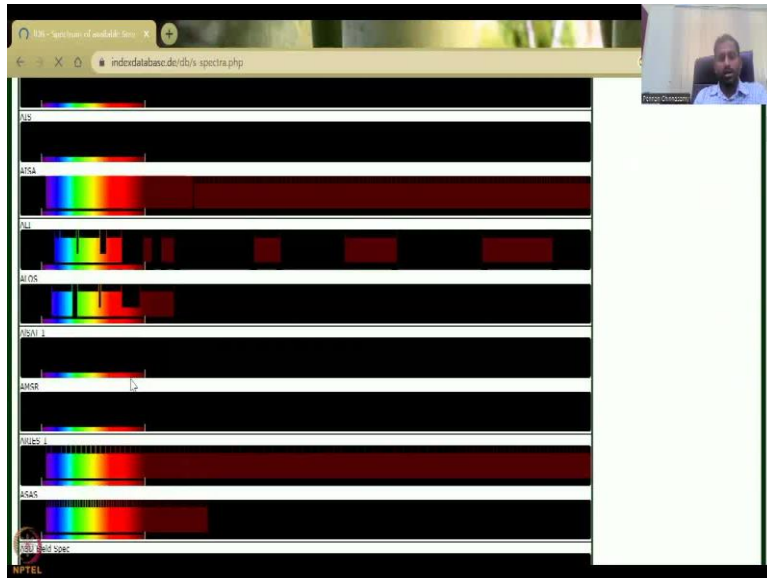
Nr.	Author	Title	Year	Journal	Publisher/Loc.	Keywords	Comment	# Ind.	# Scns.	# Appl.
1		Index Data						1	0	0
2	Aber, Beate Gebreselassie	Application of remote sensing and spatial Data Integration Modeling to Predictive Mapping of Arable Mineralized zones in the Ethiopian Lowland Gashum Complex, Western	2000	International Journal for Geographical Science and earth Observation	Utrecht, the Netherlands			0	1	0
3	Ahmed, I.; Han, L.; Zhang, Y.; Tang, K. C.	A review of remote sensing methods for biomass feedback prediction	2011	Biomass & Bioenergy		Proximal energy crops; Silico-phytic measurement; Vegetative indices; Leaf area index; Satellite imagery; Remote sensing; Tropical forest biomass; Landsat data; Unmanned aerial vehicle; Leaf area index; Aboveground biomass; Red-edge band; Vegetation; Index; Water stress; Multispectral properties; Image interpretation		14	1	0
4	Al-Khatib	Soil salinity Detection Using satellite Remote Sensing	2003		International Institute for Geo-information science and earth observation, Enschede, The Netherlands			2	1	0
5	Apón, Armando; Meid, Peter; Pineda, Stuart; McVey, John	Transmission and assessment of near-infrared vegetation indices from a 1.1 hyperion imagery for discriminating sugarcane species	2002	Spatial Sciences Institute Without boundaries (SSCIWU)	Spatial Sciences Institute, Canberra, Australia	hyperspectral remote sensing, spectral vegetation indices, sugarcane, biomass, hyperion		10	1	0

indexdatabase.de/db/r.php?order=pubyear

21	Glenn, Edward; Huete, Alfredo; Nagler, Patricia; Nelson, Stephen	Review - Relationship Between Remotely-Sensed Vegetation Indices, Canopy Albedo, and Plant Physiological Parameters: What Vegetation Indices Can and Cannot Tell Us About Leaf Level	2008	Sensors						
22	González Sampedro, M.; Tu, T.; Mirza, T.; Kuroki, T.; Nishio, S.; Ino, M.; Gao, S.; Han, X.; Christophe, Renaud; Kanyo, Teruyuki; Daniel, Fontallier; Jean Yvon, N. Aguiar, Nathaly; Janet, Wright; Lee, Uwe; Vensky, Dushko; Fie...	Seasonal variations of leaf area index of agricultural fields retrieved from Landsat data	2008	Remote Sensing of Environment				1	3	4
23	Mirza, T.; Yoshida, H.; Fujihara, K.; Yamamoto, T.	Calibration and validation of hyperspectral indices for the estimation of leaf-level forest leaf chlorophyll content, leaf mass per area, leaf area index and leaf canopy biomass	2008	Remote Sensing of Environment		Chlorophyll; LMA; LAI; Leaf biomass; FVI; Hyperion; ASD; HeliSpec; LAI; PROSPECT; SAUI; PROSAIL		0	1	1
24	Mirza, T.; Yoshida, H.; Fujihara, K.; Yamamoto, T.	Inter-Comparison of ASD and MQUIS Sensor Reflectance and Vegetation Index Products for Synergistic Applications to Reduce Resource Monitoring	2008	Sensors				3	2	1
25	Pu, Ruihang; Gong, Peng; Yu, Qian	Comparative Analysis of NDVI and Hyperion, and Landsat ETM+ Data for Mapping Forest Crown Closure and Leaf Area Index	2008	Sensors				12	3	2
26	Vicini, M.; Fozzi, E. and D'Alonzo, D.	A broad band leaf chlorophyll vegetation index at the canopy scale	2008	Precision Agriculture		Remote sensing, Vegetation indices, Leaf chlorophyll concentration, Variable ratio formulation		1	0	0
27	Wu, Chongxin; Hu, Cheng; Tang, Quesi; Huang, Wentao	Estimating chlorophyll content from hyperspectral vegetation indices: Modeling and validation	2008	Agricultural and Forest Meteorology		Vegetation indices; Sensitivity; Chlorophyll content; LAI; Validation		17	1	4
28	Blackburn, George Alan	Hyperspectral remote sensing of plant pigments	2007	Journal of Experimental Botany				0	11	1
29	Uricio, W. A.; Zurita Millu, R.; de Wit, A. T. W.; Brazile, J.; Singh, R.; Schepers, M. P.	A review on reflective remote sensing and leaf area estimation techniques for enhanced crop-ecosystem modeling	2007	International Journal of Applied Earth Observation and Geoinformation		Leaf estimation; agroecosystem modeling; vegetation indices; canopy; reflectance modeling; biophysical variables; leaf-level variables; parallel processing; radiative transfer models; leaf area index; hyperspectral imaging; imaging; hydrologic data assimilation; multiple linear regression; canopy chlorophyll density; remote sensing; leaf area estimation; reflectance; soil moisture; crop models		7	7	4
30	Duwig, Wladis; Giechhausen, Heike	Automatic retrieval of crop characteristics: an example for hyperspectral AVIS data from the AgriSAR campaign	2007	Proc. on AGRI-SAR and FACI-COMPAGRI Workshop	Nieuwegein, The Netherlands	Hyperspectral, AVIS, imaging spectroscopy, retrieval, feature model selection, CASI, PROSPECT, SAUI, LAI, chlorophyll, winter wheat, winter barley, winter rape, maize, sugar beet		0	0	0
31	Chen, J. W.; Long, D. S.; Hu, Y.; Smith, A. M.	Using index measurements to evaluate the new RapidEye-4 satellite series for prediction of wheat nitrogen status	2007	International Journal of Remote Sensing				8	1	0

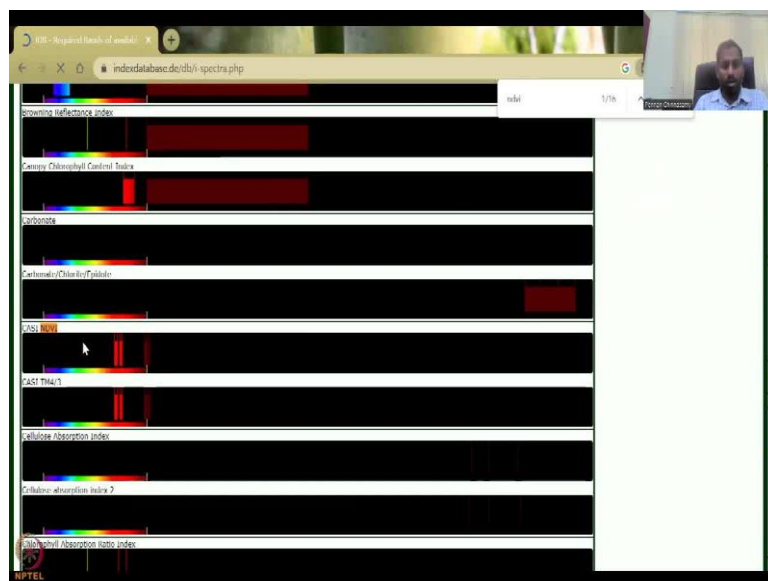
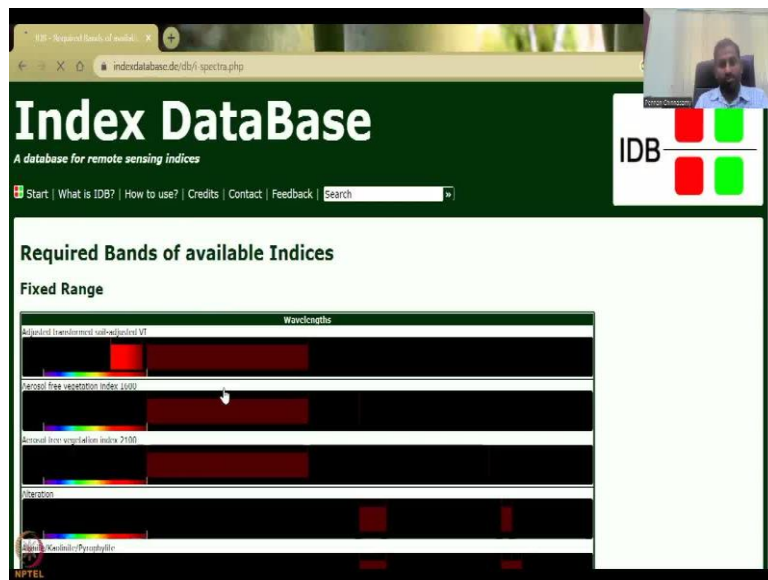
indexdatabase.de/db/r.php?order=pubyear

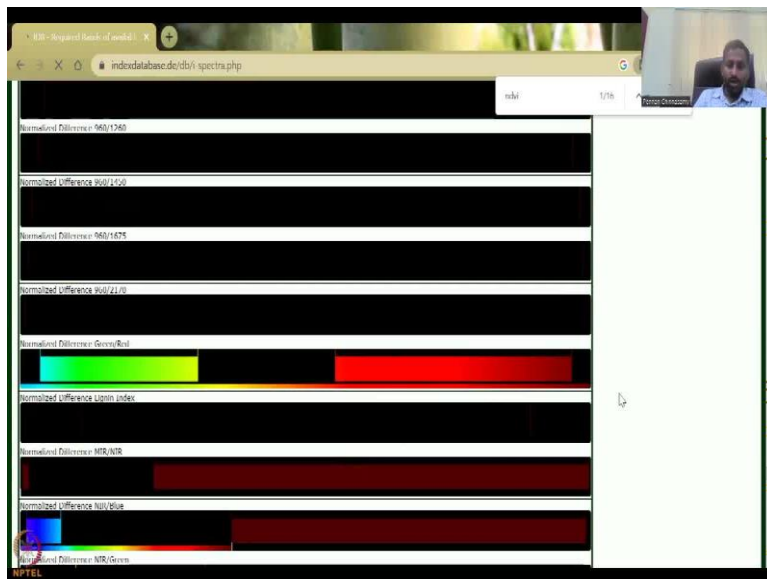
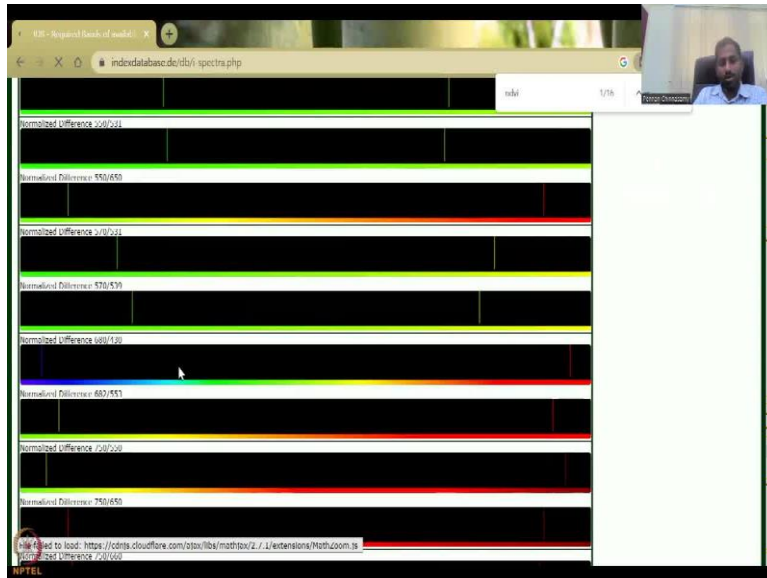
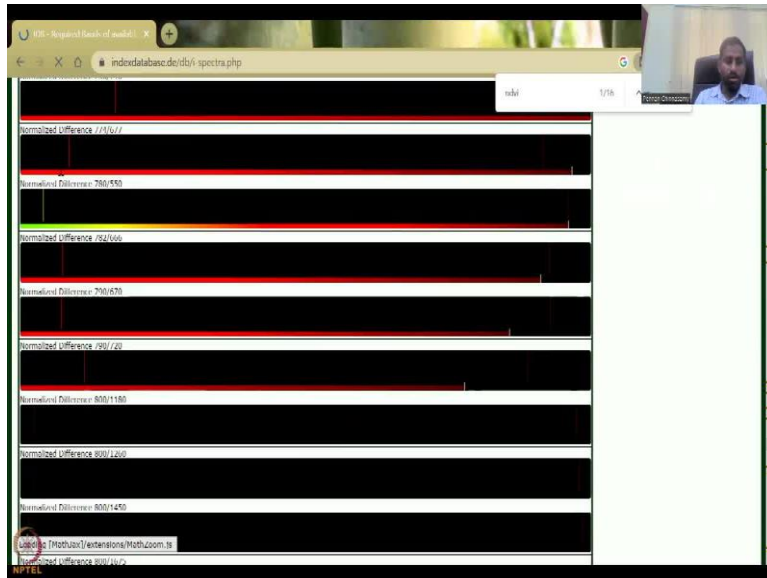
210	Louche, C.; Lemoine, M. O.; Lemoine, M. O.	Estimation of vegetation indices from satellite remote sensing	1993	Remote Sensing of Environment				1	0	0
211	Hodrick, M. A.; Lemons, R. V.	The influence of soil salinity, growth form, and leaf moisture on the spectral reflectance of Sorghum arifolium canopies	1983	Photogrammetric Engineering and Remote Sensing				1	0	0
212	Ward, M. A.; Kim, V.; Smart, R. M.	The influence of Soil Salinity, Growth form, and Leaf Moisture on the Spectral Reflectance of Sorghum arifolium Canopies	1983	Photogrammetric Engineering and Remote Sensing				1	0	0
213	Ray, C. M.; Kesteven, C. A.; Schell, J. A.; Smith, A. M.	Development of AI procedures for dealing with the effects of spatial events on crop temporal spectral response	1979	MOUS/MSI SR 89 00134, Central NASA 9-14265				1	0	0
214	Walker, C. J.; Blinn, J. J.; H.;	Monitoring corn and soybean crop development with Landsat radiometric spectral data	1970	Remote Sensing of Environment				4	1	0
215	Murray, T. F.; Fan, C. J.	The vegetation index number and crop identification	1978	Proceedings of the Technical Session	Houston, TX, USA			1	0	0
216	Mirza, P. N.; Whittles, S. C.; Oliver, H. E.	Keuhl-Thames highlands and grasslands: the vegetation index number and crop identification	1977	Contract NASA				1	0	0
217	Wiegand, A. J.; Wiegand, C. S.	Discriminating vegetation from soil background information	1977	Photogrammetric Engineering and Remote Sensing				0	1	0
218	Quah, R. J. and Thomas, C. S.	The leaf-level crop - a graphic description of the spatiotemporal development of agricultural crops on a semi arid landscape	1976	Proc. Symposium on Machine Processing of Remotely Sensed Data	Purdue University, West Lafayette, Indiana			8	1	1
219	Rouse, J. W.; Hesse, R. J.; Borchert, J. A.; Deering, D. W.	Monitoring vegetation systems in the Great Plains with AVIS	1974	Proceedings of the Third Earth Resources Technology Satellite Symposium	Greenbelt, NASA SP-351			1	1	1
220	Rouse, J. W.; Hesse, R. J.; Borchert, J. A.; Deering, D. W.	Monitoring the vertical advancement and reproduction (green wave effect) of maize crop growth	1973	Proc. Rep. HSC 1973 1	Remote Sensing Center, West ABM Univ., College Station			3	1	1
221	Perelson, R. L.; Miller, L. D.	Remote mapping of standing crop biomass for estimation of the productivity of the short grass prairie, James National Grasslands, Colorado	1972	Proceedings of the Eighth International Symposium on Remote Sensing of Environment	Willow Run Laboratories, Environmental Research Institute of Michigan			2	0	0
222	Travis, Carl F.	Definition of Leaf Area Index from Leaf to Light on the Tansy Plant	1969	Ecology	biological Society of America			1	0	0
223	Ward, M. A.; Kim, V.; Smart, R. M.	Measuring the Color of Growing Jute with a Reflectance Spectrometer	1968	Agronomy Journal				0	0	1
224	Tang, Y.; Hu, A. R.; Upton, K.; Wu, J.	Development of a leaf-level enhanced vegetation index without a blue band	1967	Remote Sensing of Environment		Vegetation indices, FVI, FVI2, Normalized, MQUIS		3	0	0



So these are the lists and then the list of the other indicators, indices, sensors, applications, lists of references, what they have been using as references, as I said, most of it is all of it is year. Let us see the latest they have the earliest is 1960s. The latest is 2011, because the website was done in 2012, they have not updated the references, but the indicators are getting updated because you can see that they are updating all the indicators. And then visualization of sensor bands, you can see how the bands are there for a particular satellite sensor. And examples Sentinel, so for Sentinel these are the bands that are in the sensors, not all of it is covered. So the wavelength goes in the bottom in the x axis, again, it is just still populating all these sensors are taken here. So think about how many datasets they would have used together.

(Refer Slide Time: 37:34)

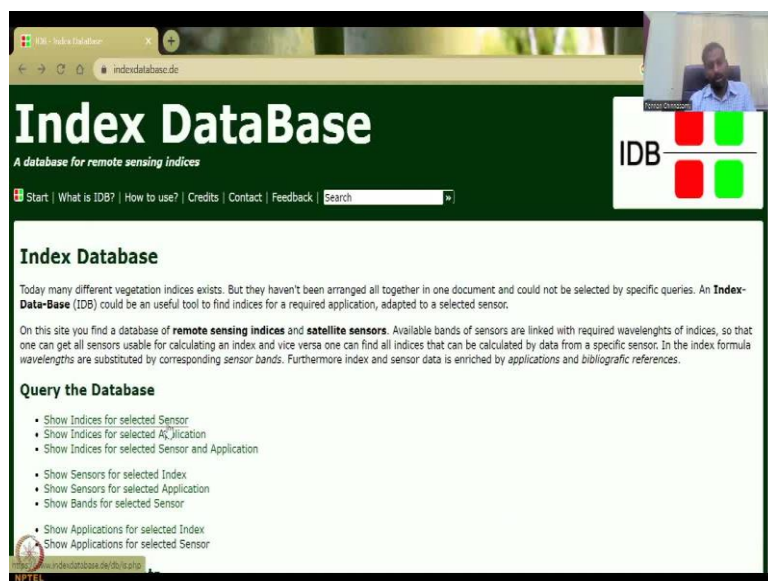
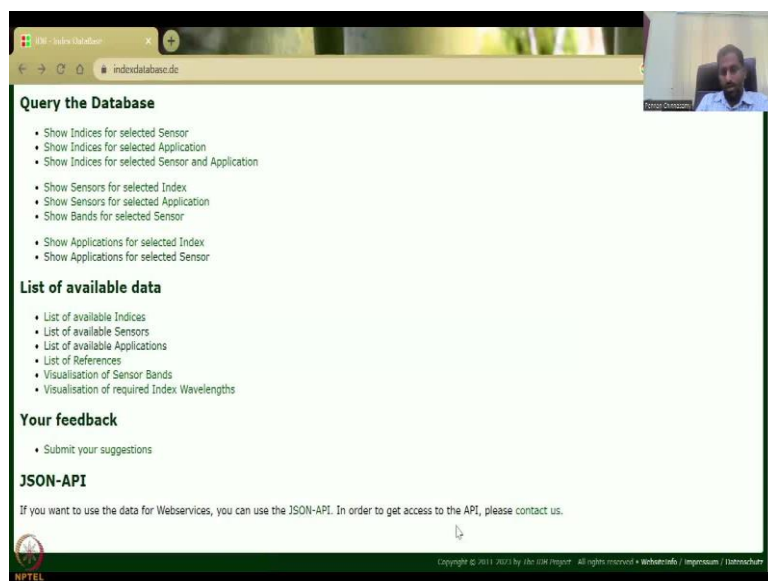






So if you look at this worldview, it has all these big, big colors, big big bands, and that is why it is expensive, it is not free, you will have to pay for these worldview kind of sensors. In the visualization required index wavelengths, you can visualize that for a particular indicator and stuff, where what are the wavelengths that you need, what are the bands that you need, this is the visible, but you need some in the near visible range also as indicated here. Most of it you can cover by using your normal available indicators. There is a lot of information, lot of data available here normal difference in the width the green is this one by 575, 539, I can see how it is getting populated. And as you would expect, there is also in the red region.

(Refer Slide Time: 38:31)







indexdatabase.de/da/single.php?id=550

No.	Name	General Formula	Comment
1	WorldView-2	400-1040	Automatic
2	WorldView 2	100 2360	Automatic

**Applications**

No results for the selected combination.

**References**

No.	Author /Title	Year/Comment
1	Shibayama, Michio, Saito, Akiyo, Uemura, Takanori, Sato-Tsuneo, Lerner, Ulrich, Saito, Akemi, Maruyama, Mitsuhiro, Ohtsuka, Tetsuo, Yoshio, Akizawa, Tsuyoshi - Detecting Phenophases of Subarctic Strati- Carnioles by Using Automated Reflectance Measurements	1999

Export bibliographic references as: BibTeX • RIS (Endnote) • CSV

**Visualisation of Sensor-Bands**

Index:

Sensors:

AIS:

AISA:

indexdatabase.de/da/single.php?id=586

# Index DataBase

A database for remote sensing indices

Start | What is IDB? | How to use? | Credits | Contact | Feedback | Search

## Shibayama, Michio... - Detecting Phenophases of Subar...

**Basic information**

Author	Shibayama, Michio, Saito, Akiyo, Uemura, Takanori, Sato-Tsuneo, Lerner, Ulrich, Saito, Akemi, Maruyama, Mitsuhiro, Ohtsuka, Tetsuo, Yoshio, Akizawa, Tsuyoshi
Title	Detecting Phenophases of Subarctic Strati-Carnioles by Using Automated Reflectance Measurements
Journal	Remote Sensing of Environment
DOI	10.1016/S0034-4275(98)00087-0
Link	<a href="http://www.sciencedirect.com/science/article/pii/S0034427598000870">http://www.sciencedirect.com/science/article/pii/S0034427598000870</a>
Date/Year	1999
Location	
Publisher	
Volume	67
Issue	2
Pages	199-209
Keywords	
Comment	

**Indices**

No.	Name	General Formula	Comment
1	Reference 833/658	$\frac{R_{658} - R_{650}}{R_{658} + R_{650}}$	
2	Normalized Difference 833/1549	$\frac{R_{658} - R_{650}}{R_{658} + R_{650}}$	

indexdatabase.de/da/single.php?id=586

**Keywords**

Comment

**Indices**

No.	Name	General Formula	Comment
1	Reference 833/658	$\frac{R_{658} - R_{650}}{R_{658} + R_{650}}$	
2	Normalized Difference 833/1549	$\frac{R_{658} - R_{650}}{R_{658} + R_{650}}$	
3	Normalized Difference 833/658	$\frac{R_{658} - R_{650}}{R_{658} + R_{650}}$	
4	NDVI2	$\frac{R_{658} - R_{650}}{R_{658} + R_{650}}$	
5	Simple Ratio 560/658	$\frac{R_{658}}{R_{560}}$	
6	Simple Ratio 833/1549	$\frac{R_{658}}{R_{650}}$	
7	Simple Ratio 833/658	$\frac{R_{658}}{R_{650}}$	
8	Soil and Atmospherically Resistant Vegetation Index: $(1 + 0.5) \frac{R_{658} - R_{650}}{R_{658} + R_{650}}$		

**Sensors**

No.	Name	Spectral Range	Bands	Calculator	Comment
1	AIS	650-7500	6		

**Applications**

No.	Name	Comment
1	Vegetation	
2	Vegetation - 1A1	

List of References

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Nr.	Name	Wavelength	Application
63	SPOT 7	450-800	Automatic
64	UK UMC 2	240-900	Automatic
64	UTRS	413-11760	Automatic
60	WorldView 2	100-1010	Automatic
66	WorldView-1	400-785	Automatic

**Applications**

Nr.	Name	Comment
1	Agriculture	
2	Agriculture - Crop yield	
3	Soil	
4	Vegetation	
5	Vegetation - Chlorophyll	
6	Vegetation - LAI	
7	Vegetation - NDVI	
8	Vegetation - Stress	
9	Vegetation - Wetness	

**References**

Nr.	Author / Title	Year	Comment
1	Alonso, A.; Martínez, I.; Alcaraz, P.; Plaza, J.; Martínez, J. - Formulation and assessment of near-infrared vegetation indices from FID-1 hyperspectral imagery for identifying vegetation density	2017	
2	Abdeloum, G. A. - Spectral indices for estimating photosynthetic pigment concentrations: A test using senescent tree leaves	1998	
3	Li, M.; Gao, F.; Frances, C.; Dubessy, F. - Towards universal forest leaf chlorophyll indices using PROSPECT simulation database and hyperspectral field reflectance measurements	2024	
4	Lichtenhaler, Hartmut K. - Vegetation Stress: an introduction to the stress Concept in Plants	1996	
5	Miao, Rui; Cao, Ming; Anany, Malina; Seneviratne, M.; Kulkarni, Marika; Kulkarni, Suresh - An investigation into robust spectral indices for leaf chlorophyll estimation	2021	
6	Renwick, J.; Patel, J.; Gupta, K.; Hsieh, J. - Estimation of plant water concentration by the reflectance water index WI (400/650)	1997	
7	Rouse, J.W., Jr.; Li, R.H.; Sclafani, L.A.; Dickey, D.W. - Monitoring the vertical advancement and retrogradation (green wave effect) of natural vegetation	1973	
8	Sims, Daniel A.; Gamon, John A. - Relationships between leaf pigment content and spectral reflectance across a wide range of species, leaf structures and developmental stages	2002	
9	Wu, Changyu; Ma, Zhong; Tang, Qian; Huang, Wenjing - Estimating chlorophyll content from hyperspectral vegetation indices: Modeling and validation	2020	
10	Senou, Abdou, P.; Weber, J. K.; Voloud, L. L.; Mohammed, G. H.; Simpson, P. H. - Scaling up and model inversion methods with narrow band optical indices for chlorophyll content estimation in closed canopies with hyperspectral data	2021	

So with this you can also use the web services and then you can ask them how to use it directly. So JSON API can be used and that can actually quicken your aspect, this is for mostly for learning and seeing what data is available then from here you can go to the database that I initially shown. So as I said, doing this would take a lot of time for a PhD student for a master's student to read papers, read the applications, who is the owner, what is the formula, etc. everything is given here.

Then I expect you to use it directly into your analysis part or your part where you have your values and regions. So this is not region specific, there is nowhere you can put India, global, Malaysia, Australia, etc. or US, but you will have to put it later in your links. So this can give you links to the different sensors and applications tree etc. it will actually tell you like where you can get different data sets, different indicators you can get.

Then let us see if you click on one of these, there is enormous differences you can get on the indicators, the sensors that they do, the references for that. You can click on this it goes to the paper hopefully, yes, it goes to the paper and then this paper what are the other indicators they have discussed about all these things are given. Very well done, I would say and then the applications part also. So, I hope you will use this for your analysis and see where it can be used the sensors that can be used applications are a lot in agriculture, lot of references, etc. So, I will stop with this is a beautiful database for finding the indicators, the formulas, the wavelengths, the bands and also for sensors. I will see you in the next class. Thank you.