



# USE OF LIDAR AND AERIAL-PHOTOGRAMMETRY IN FORESTRY APPLICATIONS

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JICA Trainee in Remote Sensing

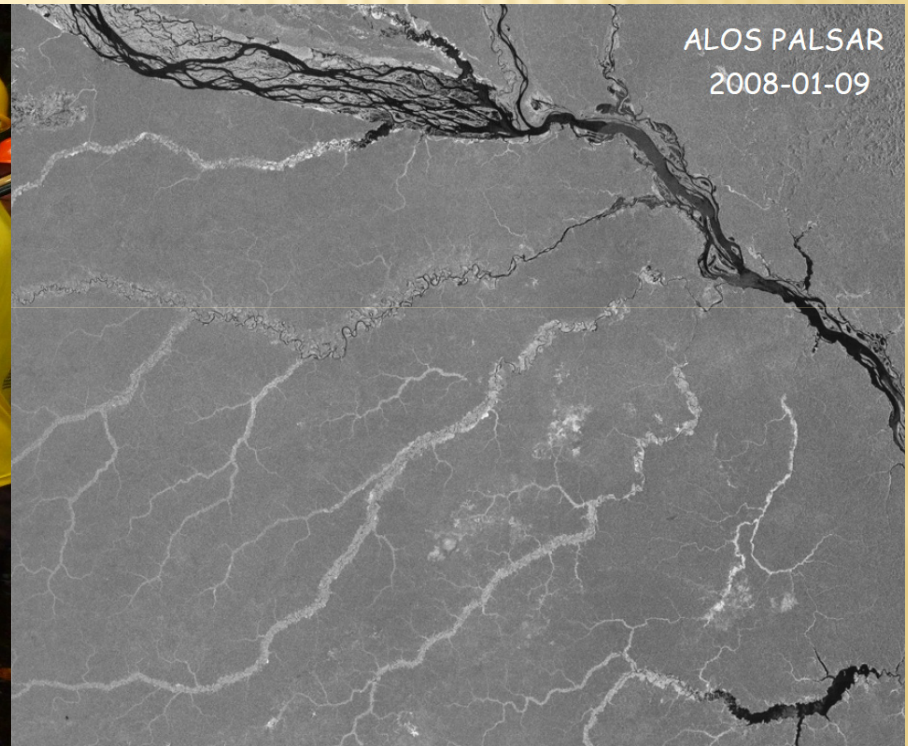
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# INTRODUCTION

## ✕ Carbon Dynamics of Amazon Forest – CADAFA



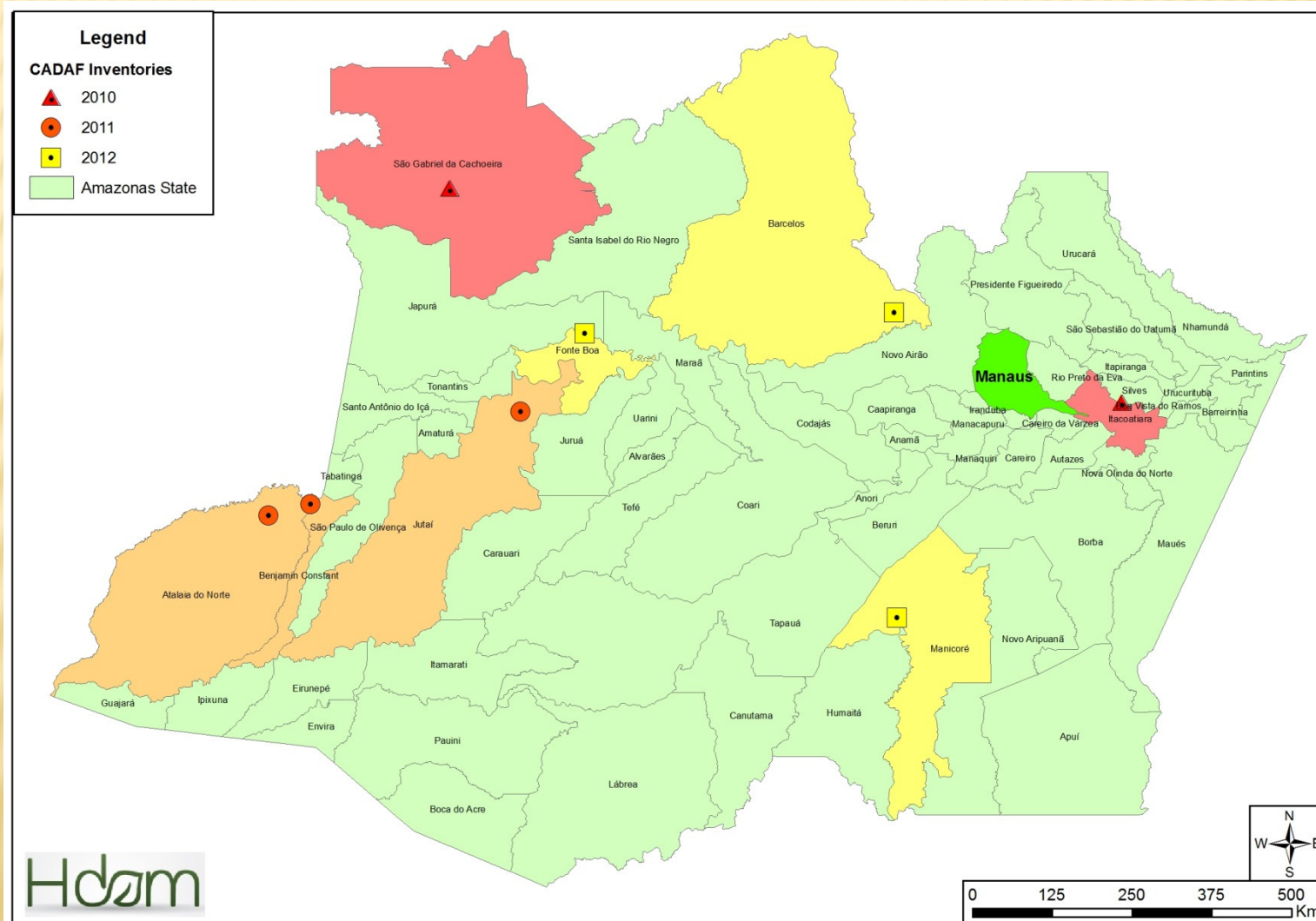
[Hdom.com.br](http://Hdom.com.br)



[jda.jaxa.jp](http://jda.jaxa.jp)

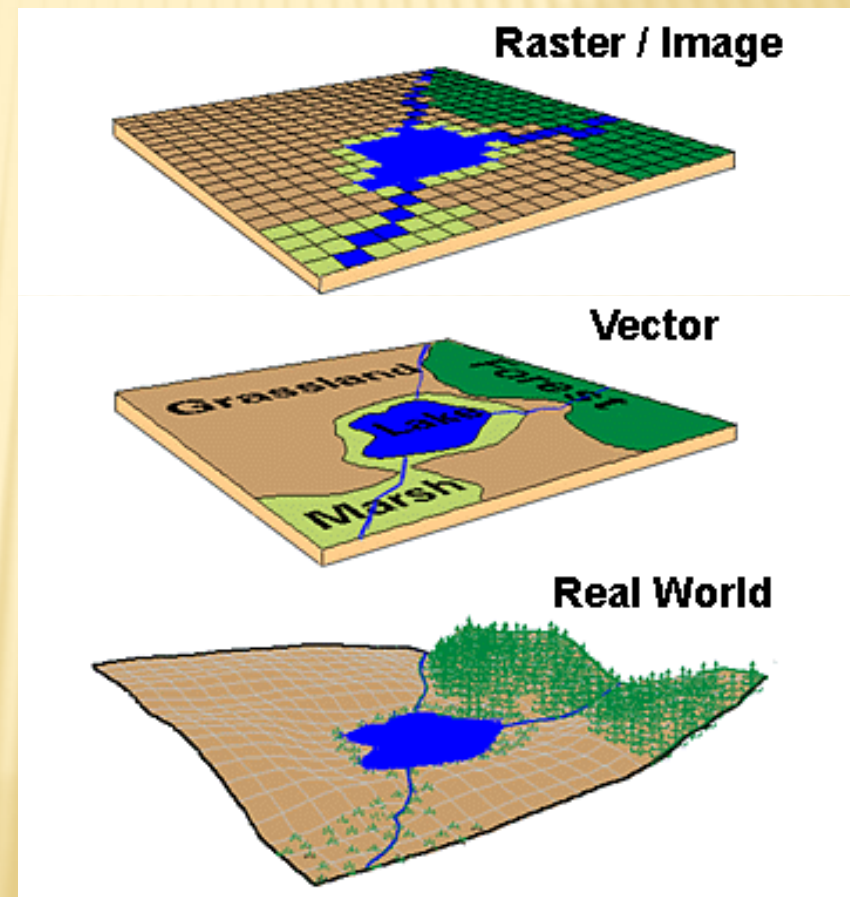
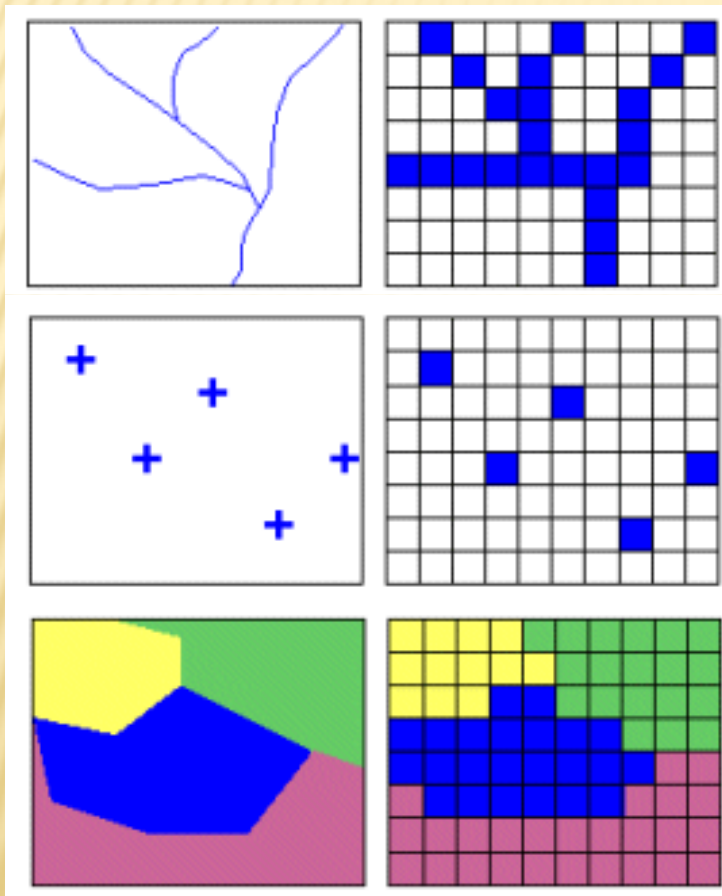
# INTRODUCTION

## ✕ Carbon Dynamics of Amazon Forest – CADAFA



# INTRODUCTION

- ✖ Remote sensing Data: Vector x Raster (Matrix)



# OBJECTIVES OF THE TRAINING

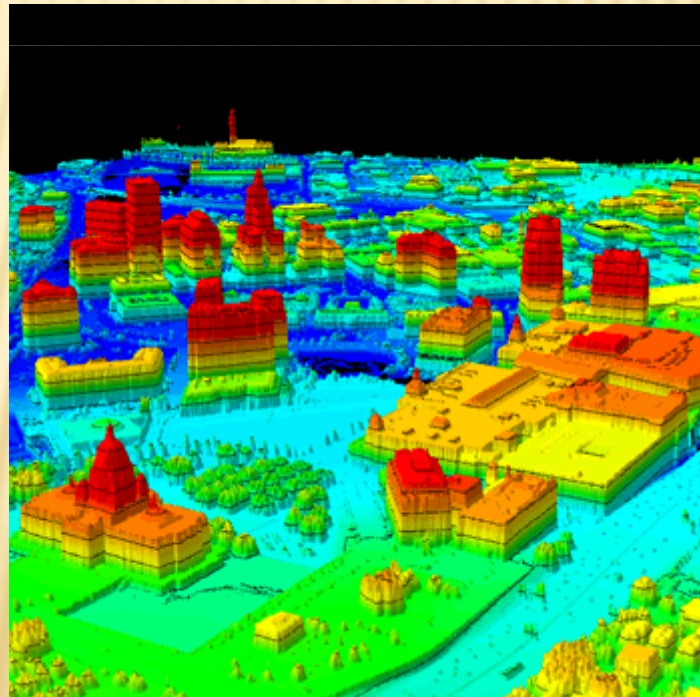
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- ✖ Learning the use of the LiDAR data using the softwares we dispose in CADAFA Project;
- ✖ Learn about information and data processing of aerial photogrammetry;
- ✖ Share information about remote sensing and field truth with Sawada Sensei team.

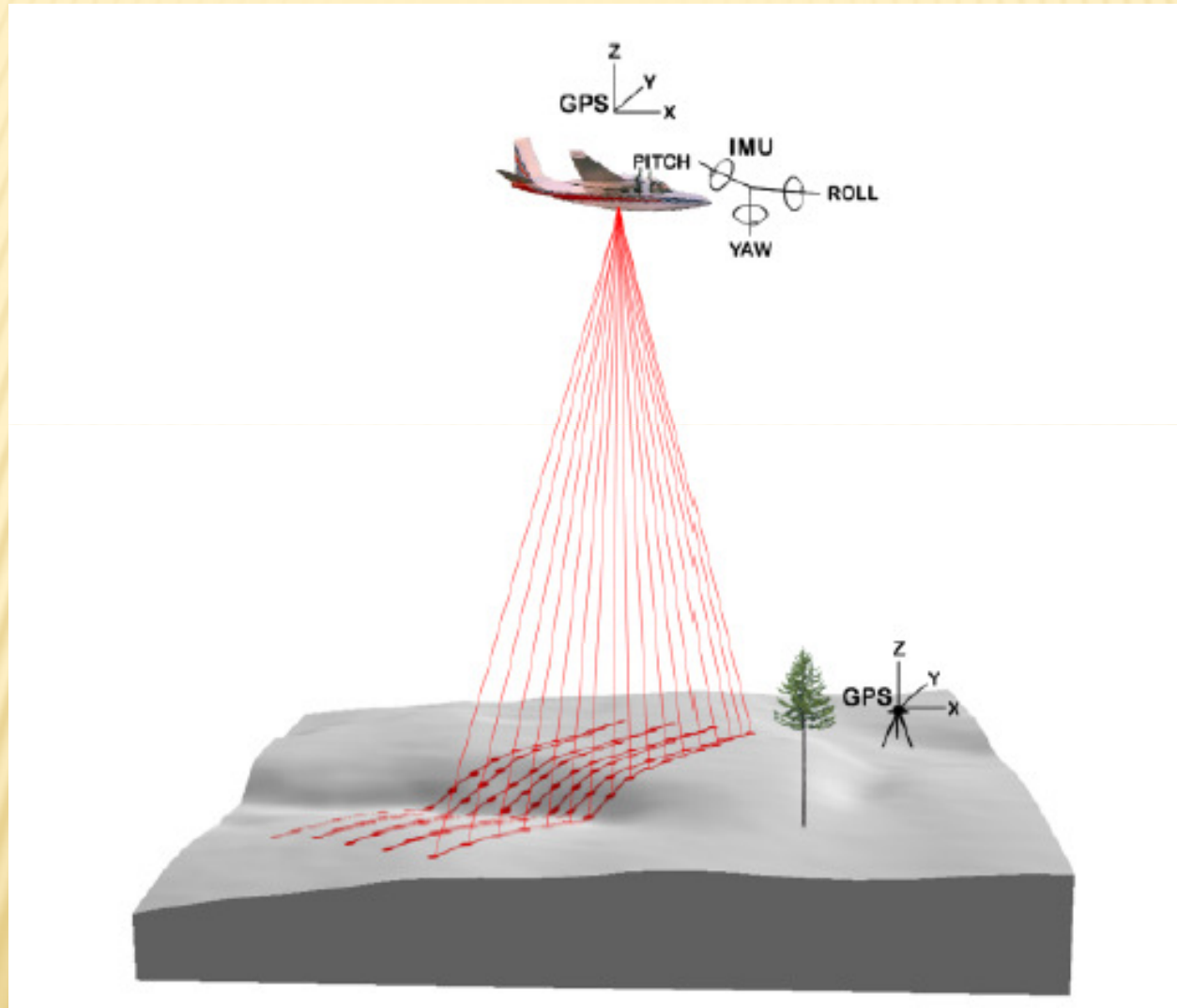
# LIGHT DETECTION AND RANGE - LIDAR

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Light detection and ranging systems (LIDAR) use laser light to measure distances. Airborne laser-scanning technology is a specialized, aircraft-based type of LIDAR that provides extremely accurate, detailed 3-D measurements of the ground, vegetation, and buildings.

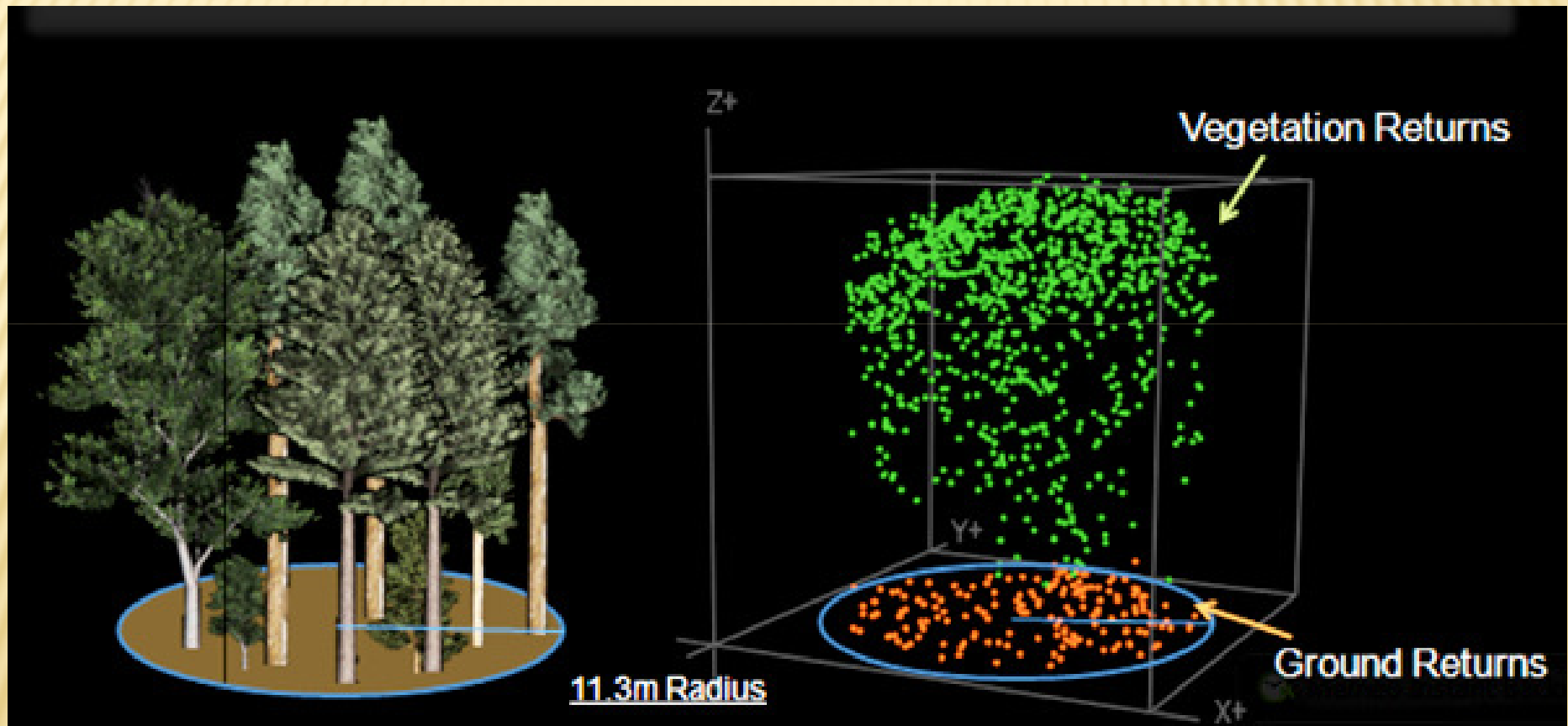


# LIGHT DETECTION AND RANGE - LIDAR



FUSION/LDV Manual

# LIGHT DETECTION AND RANGE - LIDAR



# FUSION SOFTWARE

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**FUSION**

*Providing fast,  
efficient, and flexible  
access to LIDAR, IFSAR  
and terrain datasets*



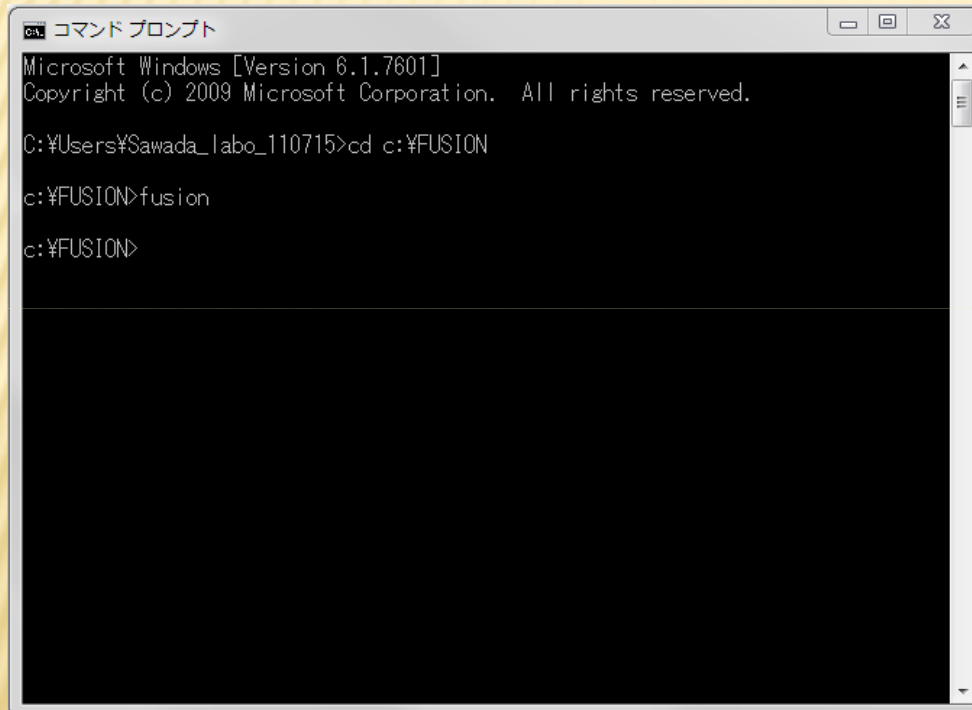
Version 3.21  
Build date Oct 15 2012

***Robert J. McGaughey***  
***Pacific Northwest Research Station***

# FUSION SOFTWARE

Program Name	Description
ASCII2DTM.exe	Converts an ASCII raster surface model into the PLANS format used by FUSION
ASCIIImport.exe	Converts variable format ASCII LIDAR data to LDA or LAS format
canopymodel.exe	Creates a canopy surface model from a point cloud
groundfilter.exe	Filters a point cloud to identify bare-earth points
pdq.exe	TOOL:3D LAS Display
TINSurfaceCreate.exe	Creates a surface model using all points in LIDAR data files (uses TIN then grids to final cell size)
FilterData.exe	Applies various filters to return data
FirstLastReturn.exe	Extracts first and last returns from a point cloud
fusion.exe	Starts FUSION
GridSample.exe	Extracts samples of grid values around an XY position
GridSurfaceCreate.exe	Creates a gridded surface model from point
GridSurfaceStats.exe	Computes surface area and volume for the surface. Result is a raster layer.
groundfilter.exe	Filters a point cloud to identify bare-earth points
imagecreate.exe	Creates an image from LIDAR data files using the intensity values and specified color ramp
imprtdem.exe	TOOL:USGS DEM Import Utility
IntensityImage.exe	Creates images using the intensity values from a point cloud
LDA2ASCII.exe	Converts point data stored in LDA format to ASCII text format
LDA2LAS.exe	Converts LDA point cloud files to LAS format (not all fields in LAS format are populated)
LDAConvert.exe	TOOL:LIDARDAT text ->LIDARDAT binary
ldv.exe	TOOL:LDV=LIDAR Data Viewer, 3D plot
LTKProcessor.exe	TOOL:Batch Maker

# FUSION SOFTWARE

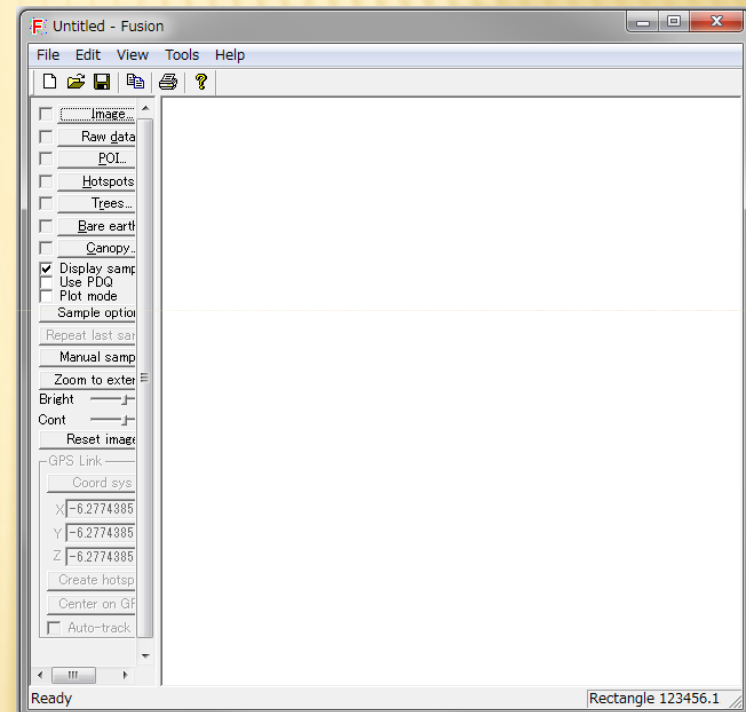


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コマンド プロンプト
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

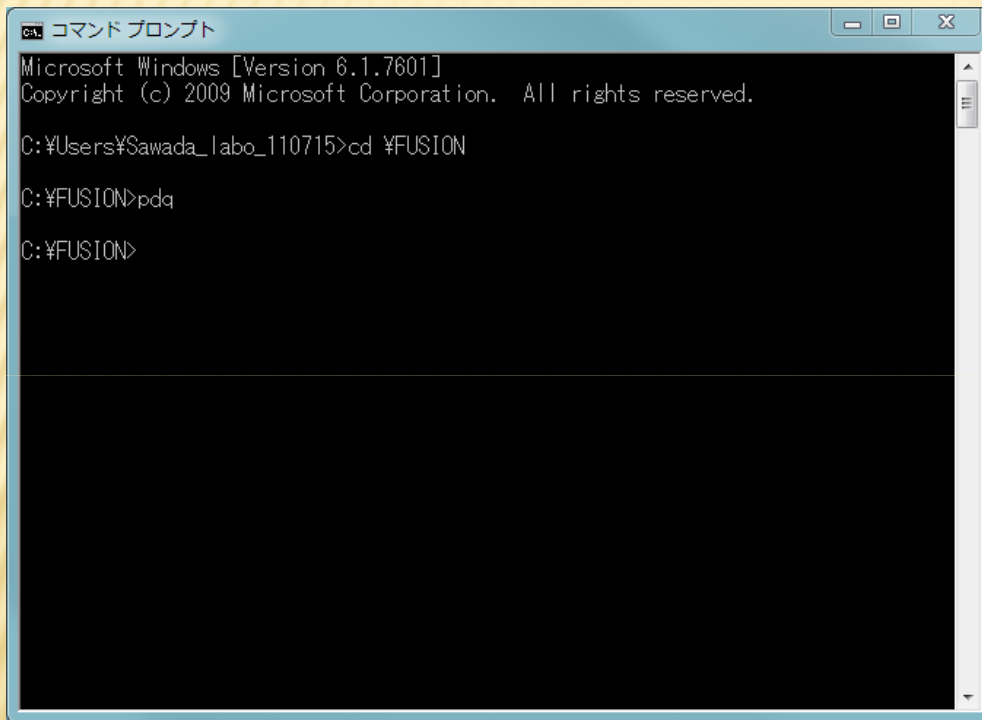
C:\Users\Sawada_labo_110715>cd c:\FUSION

c:\FUSION>fusion

c:\FUSION>
```

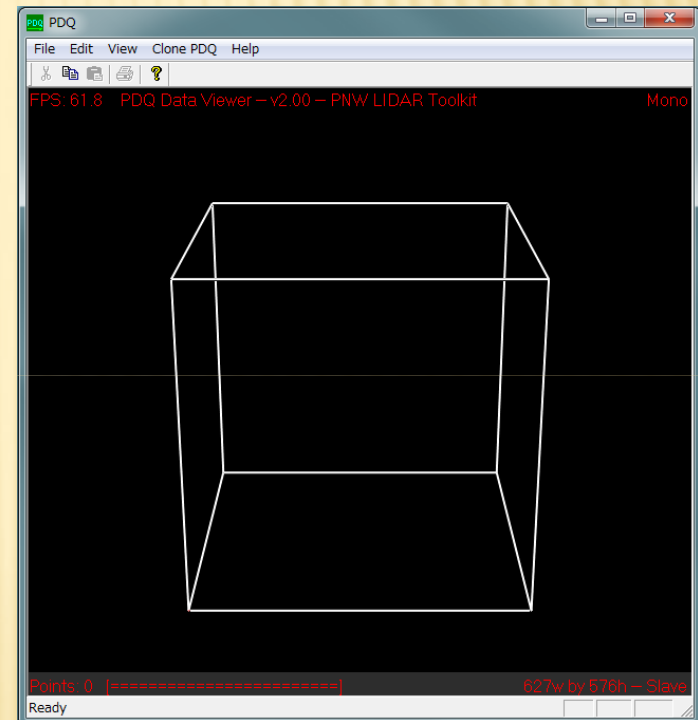


# FUSION SOFTWARE

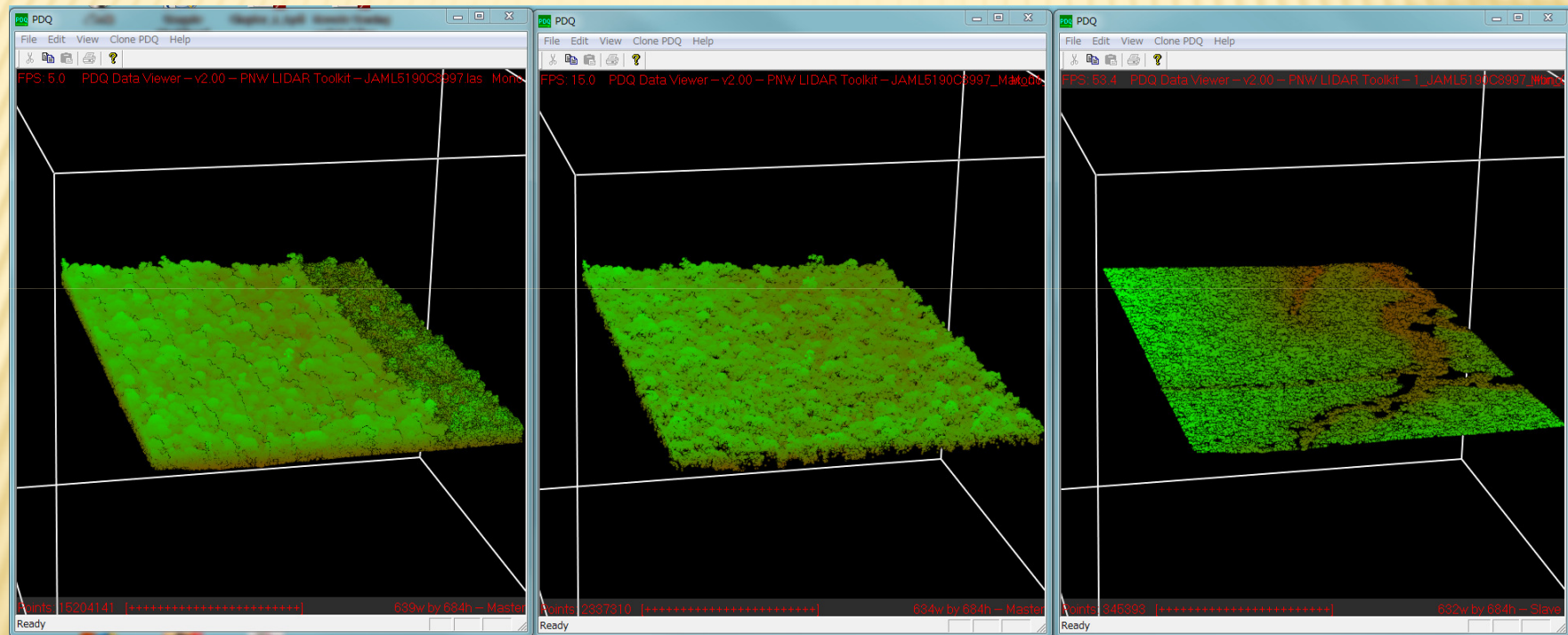


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コマンド プロンプト
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\Sawada_labo_110715>cd %FUSION
C:\%FUSION>pdq
C:\%FUSION>
```



# FUSION SOFTWARE



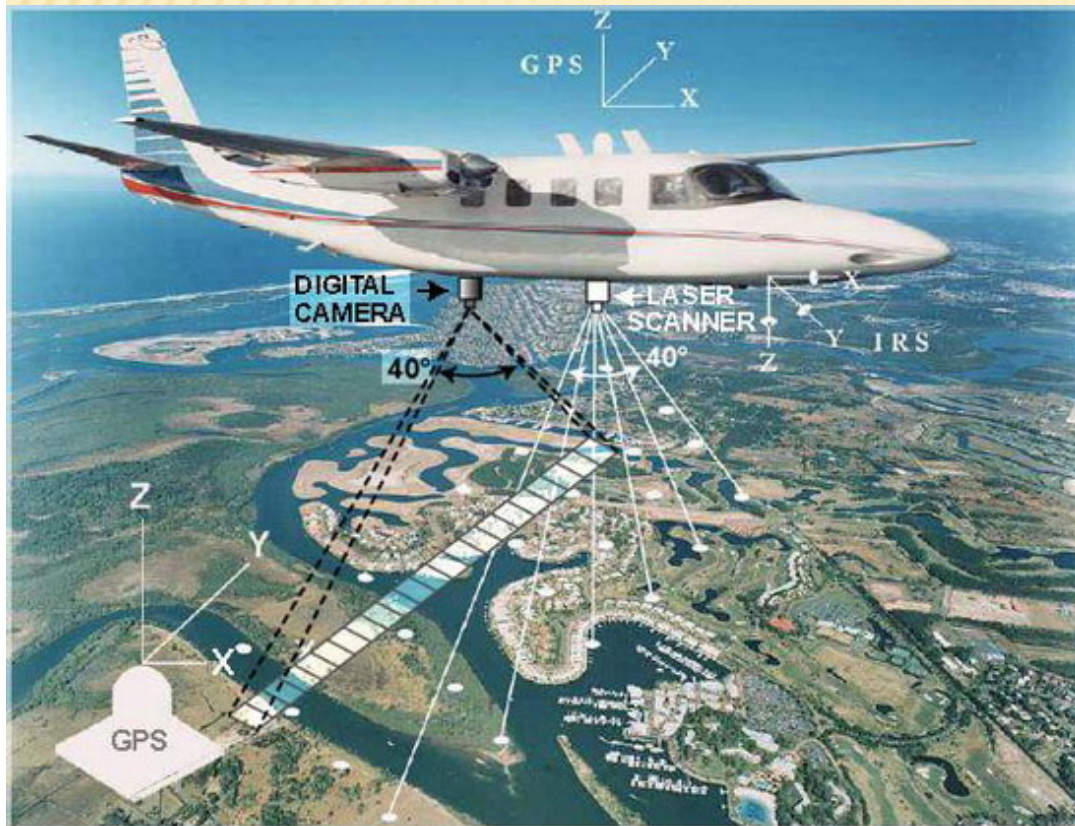
The LAS Data

The Crown Surface Data

The Ground Surface Data

# AERIAL PHOTOGRAMMETRY

## ✖ Asia Air Survey



# AERIAL PHOTOGRAMMETRY

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## ✕Asia Air Survey



# AERIAL PHOTOGRAMMETRY

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## ✖ AZuka Software

- ✖ AZuka is a cost-effective 3D digital mapping software. Data products created from aerial photos and satellite images are seamlessly integrated in GIS systems, 3D viewers and VRLM building model development. AZuka allows data import from both airborne and satellite sensors platforms such as scanned images, Digital Mapping Camera (DMC), UltraCam series, ALOS PRISM, IKONOS, GeoEye, QuickBird, WorldView.

# AERIAL PHOTOGRAMMETRY

## ✖ Azuka Software

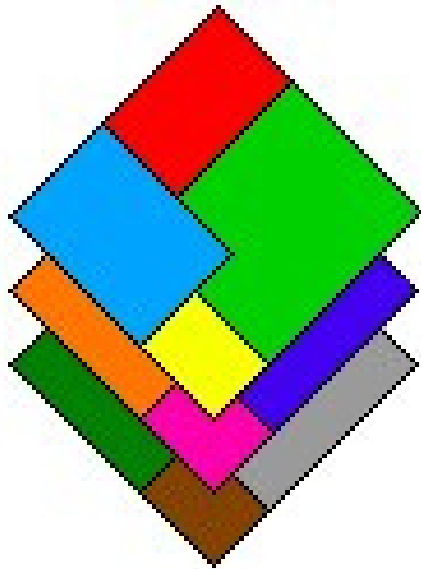
Let's try!

- Project Management
- Aerial Triangulation
- Automatic DEM
- Feature Extracting & Editing
- Ortho Generating
- Ortho Mosaicking



<https://meijin.survey.ne.jp/azuka/training.html>

# OTHER REMOTE SENSING SOFTWARES



Multispec



# THE GREAT REMOTE SENSING CHALLENGE

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- + Understand and process different types of data;
- + Use different types of spectral response data;
- + All remote sense data based on field truth.

# THE GREAT REMOTE SENSING CHALLENGE

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Use of na Unmanned Aircraft Vehicle – UAV in Amazon

# THANK YOU FOR THE OPPORTUNITY

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Amazon Forester

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