

# AARIS

## Automated Airborne Remote Information System

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# AARIS - Automated Airborne Remote Information System

- **Automated**

- Low Cost
- Quick Turn

- **Airborne Remote**

- Vertical Color Digital Images
- 0.25 to 2 m/pixel

- **Information System**

- Orthorectified/Georeferenced Images
- Database Files for Images to Ease Use and Cataloging
- No Copyrights
  - Use each image for multiple uses without restriction

# AARIS - Automated Airborne Remote Information System

- **History**

- Initial use 1997 with film camera
- Converted to digital camera 2002
- In process to add GYRO and full automation

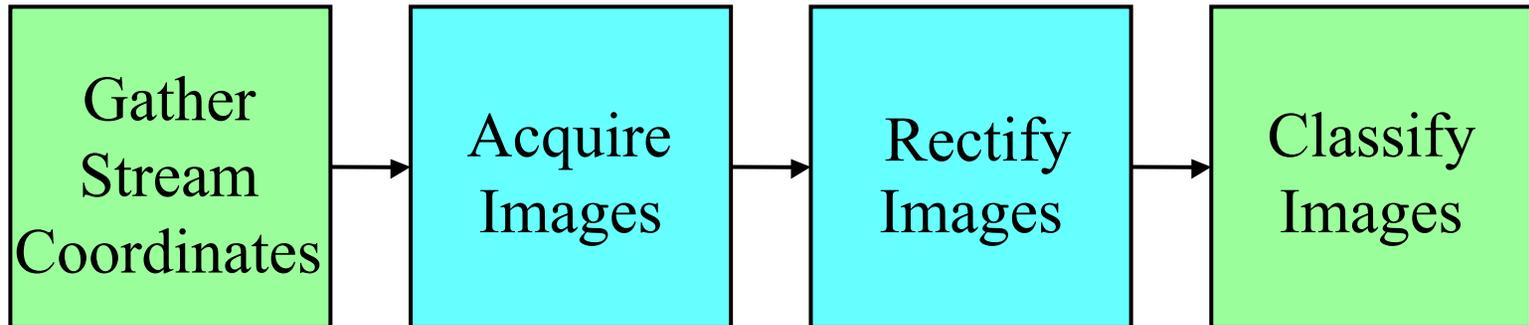
- **Users**

- DOGAMI (1998 - 2003)
- ODA (1999, 2001)
- EPA (2000)

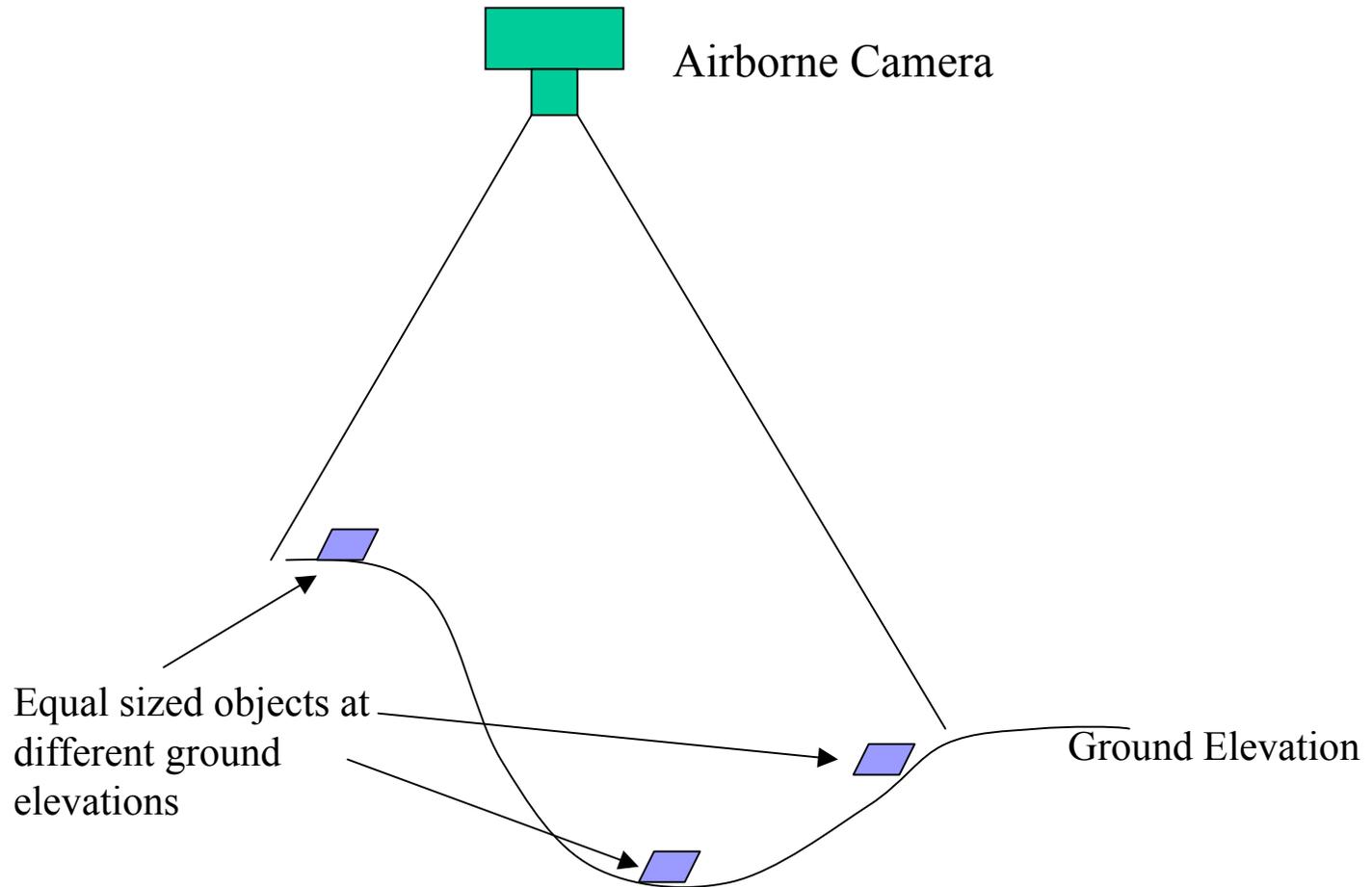
- **Future**

- Seek niches where AARIS is appropriate

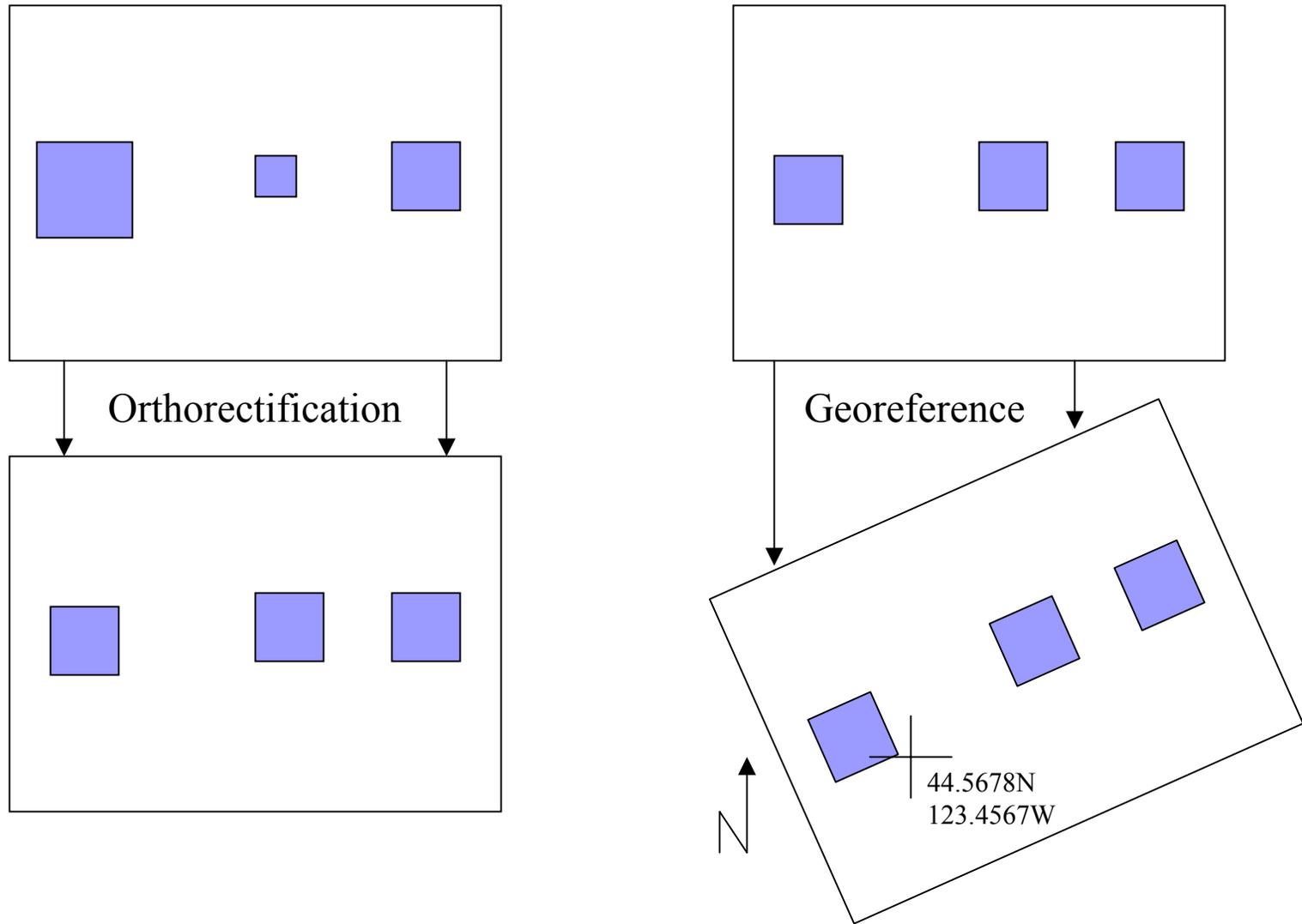
# Remote Sensed Data Acquisition Process



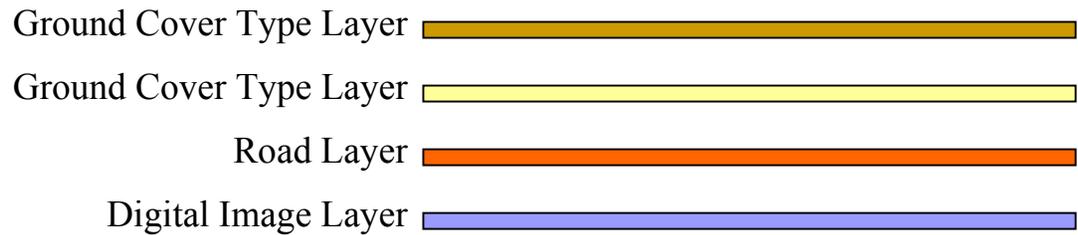
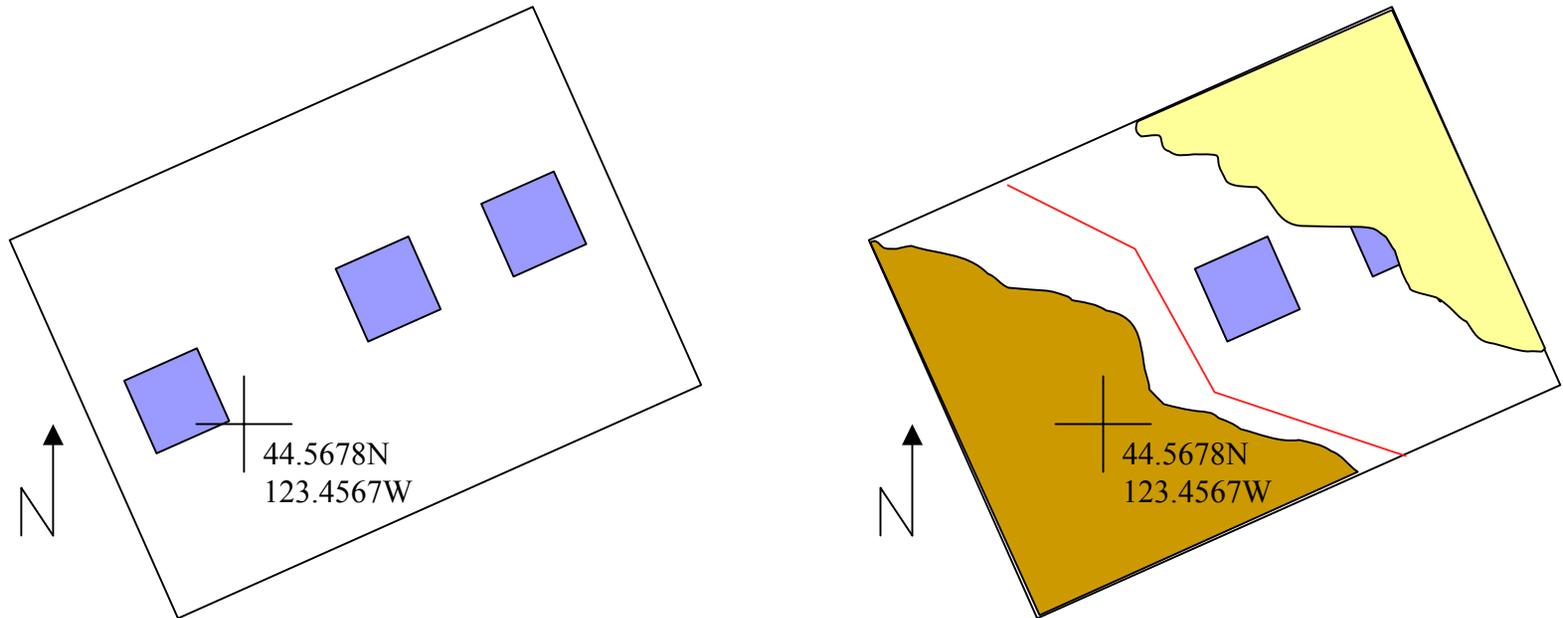
# Converting 3D to Accurate 2D Images



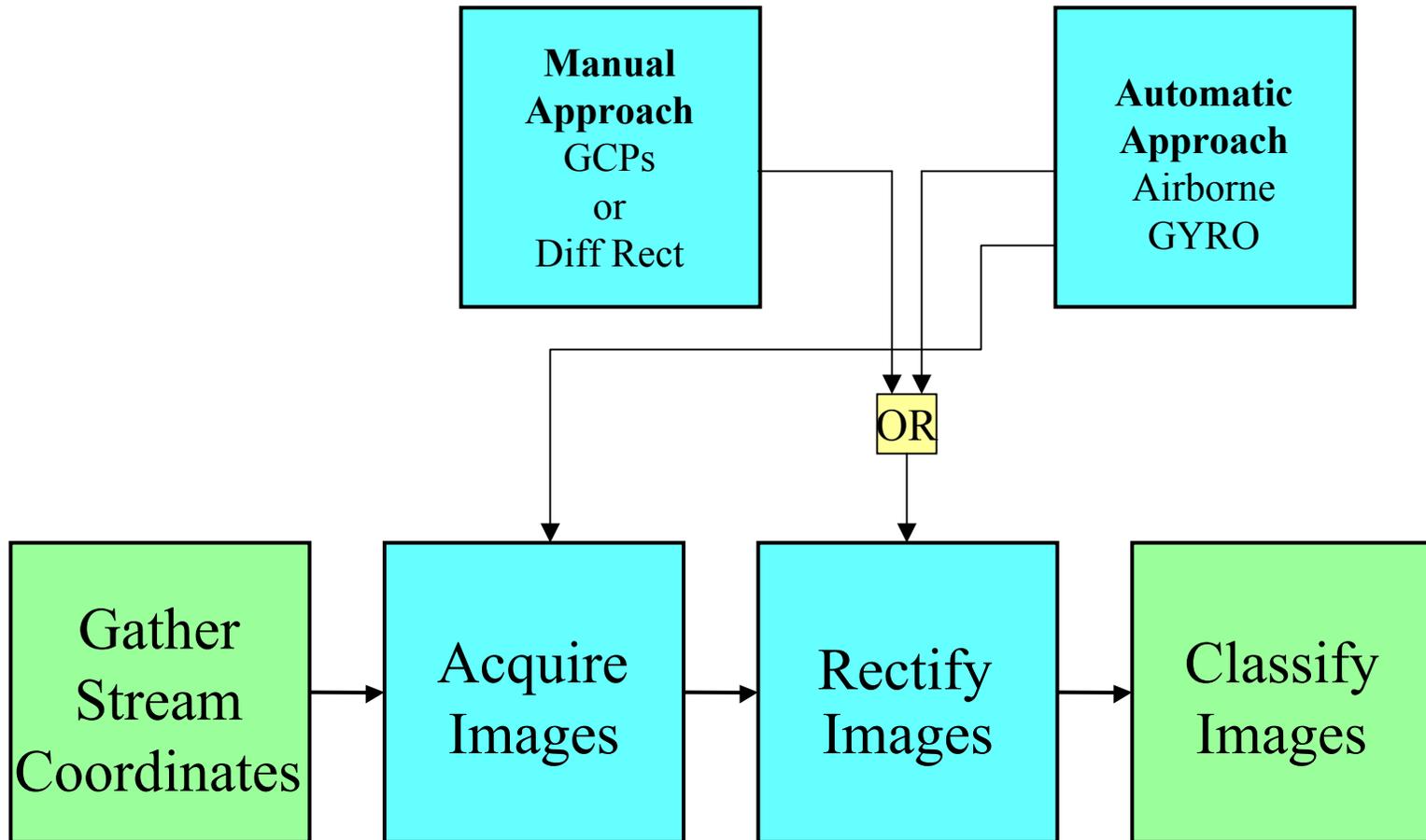
# Converting to Orthorectified and Georeferenced Images



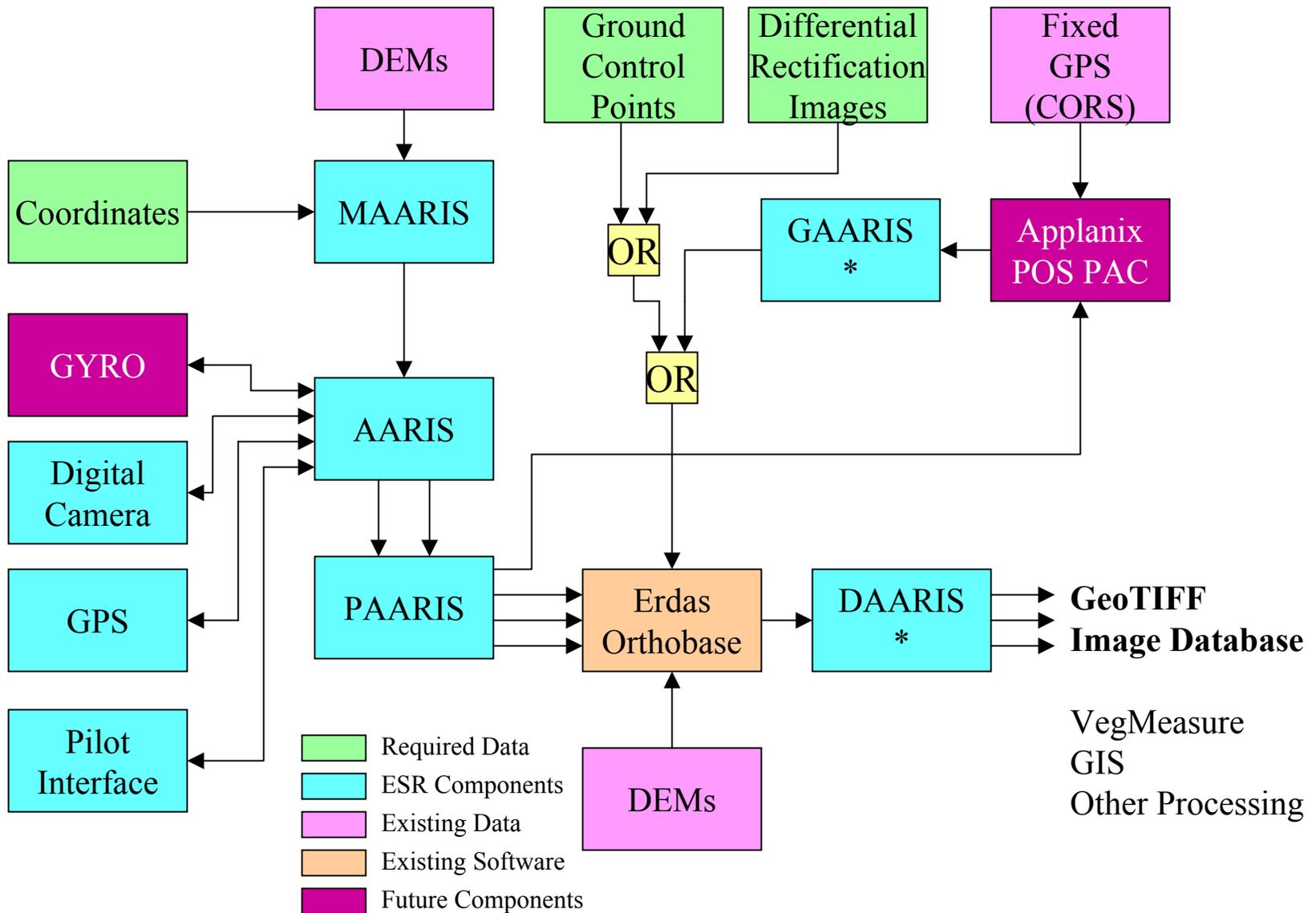
# Using Rectified Images with GIS Layers



# Manual or Automatic Rectification

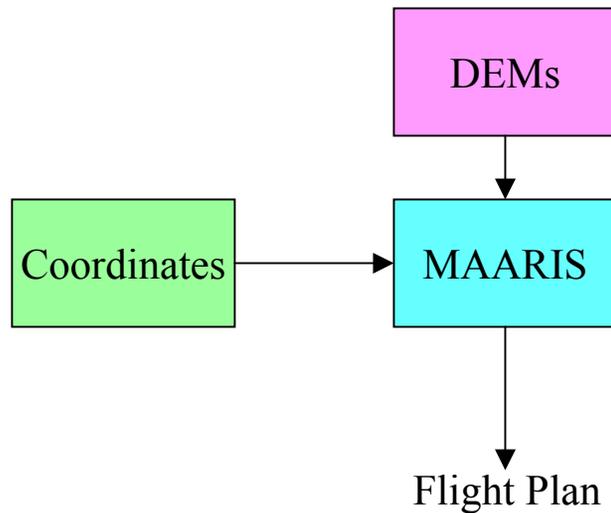


# AARIS Components



AARIS

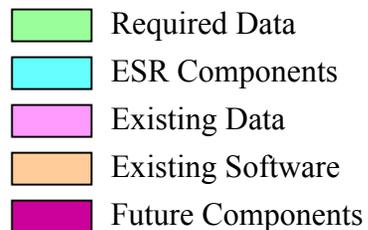
# Preflight Planning



## MAARIS

Map software for preflight planning.

- 1) Supplied coordinates define site location.
- 2) DEMs supply site ground elevation.
- 3) MAARIS is a graphical map program that simplifies flight planning.
- 4) MAARIS provides flight plan data to AARIS.



# MAARIS Flight Plan Screen

MAARIS 2.1

Zoom Out (O)    Zoom In (I)

Sites In Flight	Total Distance	Flight Time	Total Cost
35	114.4	1.0	455.00
Start (S)	End (E)	Cost/Site	
358	503	13.00	
		Base Cost	
		200	
		Airspeed	
		120	
		Process/Site	
		3	
		Cost/Hour	
		150	

Clear    Remove

Flight Line List

- 15-0096
- 15-0037
- 15-0084
- 15-0211
- 15-0166
- 15-0163
- 15-0105
- 15-0013

Data Mode (D)    SITES

Site ID    Site Index

15-0163    110

Site Name  
Black Rock Pit

Company Name  
Quality Rock Products, Inc.

Description  
Basalt

Size    Customer

30    DOGAMI

Flight Altitude    Site Elevation    Site Latitude

9000    6936    2936    42.2033

Desired Overlap    Number of Photos    Site Longitude

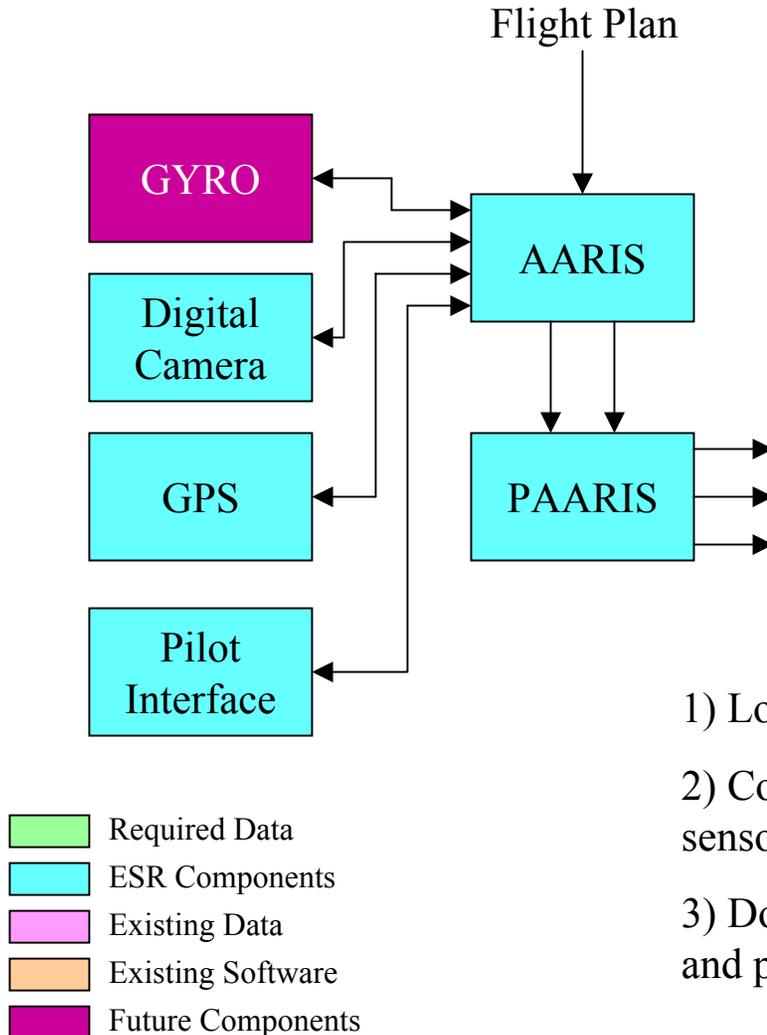
0    1    122.5889

Not Assigned     Taken  
 Assigned     Airports

EXIT NO SAVE    DONE

Right Click to center on Mouse.    M to Modify Site Data    D to change Data Mode    I to Zoom In    O to Zoom Out

# Airborne Data Acquisition



## AARIS

Automated Airborne  
Remote Information  
System

## PAARIS

Post flight software to  
reformat data and prepare it  
for the next steps.

- 1) Load flight plan data.
- 2) Conduct flight acquiring images and all sensor data.
- 3) Download all data and images from aircraft and post process to prepare for next steps.

# AARIS Flight Screen

10M

**AARIS 2 Ver 2.2.4**
45.13312,N
123.33484,W
07
1.0

AGC OFF    Bright ↑ 100 ↓    Contrast ↑ 216 ↓    Saturation ↑ 254 ↓    Hue ↑ 128 ↓

G  
S  
A  
↑  
1.00  
↓

+

Course 187    188 Bearing

Speed 131.2

Dist 9.97

ETE 0:04:33

Notes Gravel. Size: 3

**EXIT**    **Auto Sequence**

**Mode**

Frame

1

Time 193247    First Image ID 12451

Overlap 60    Num 1    **Save**

Site ID 27-0041

**Previous**

**Next**

**Start Auto**

AARIS

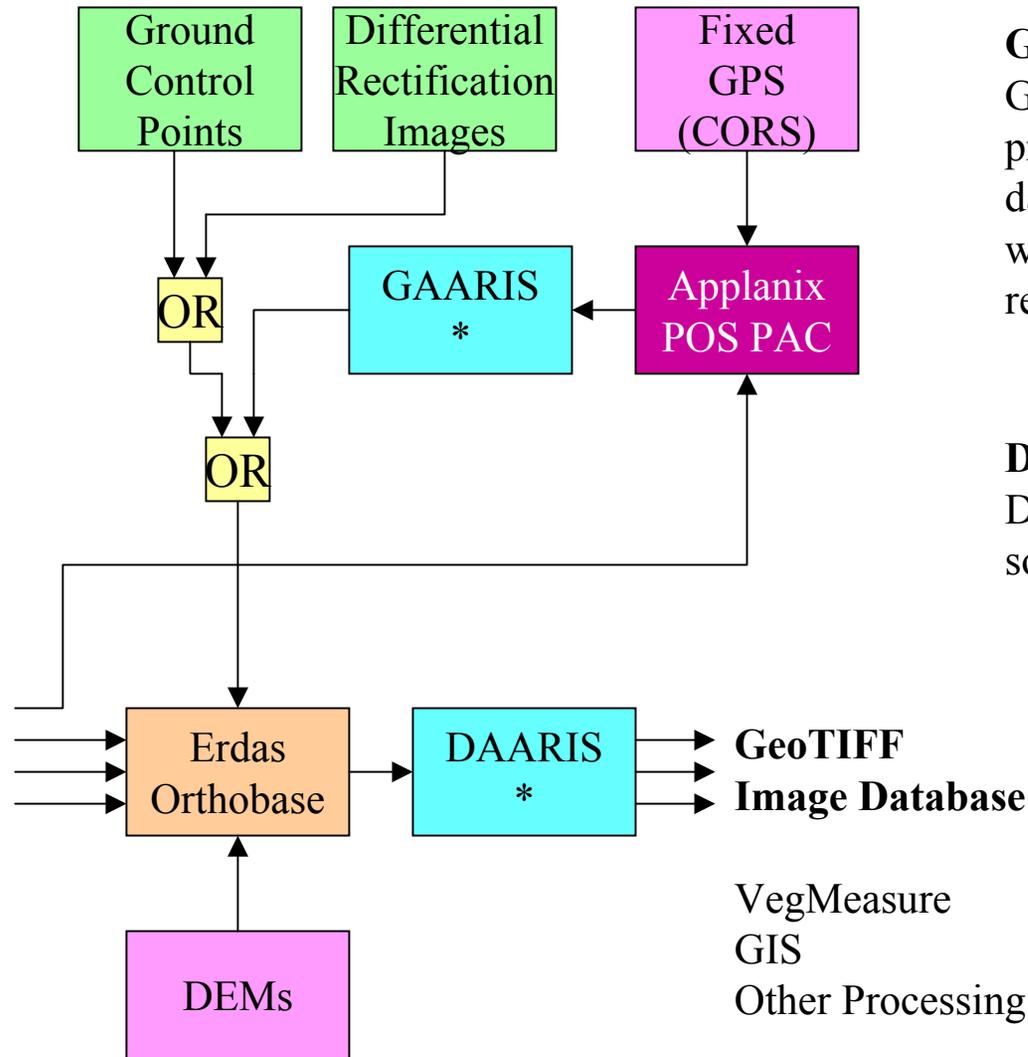
13

# AARIS System in Aircraft



AARIS

# Post Flight Processing Options



## GAARIS

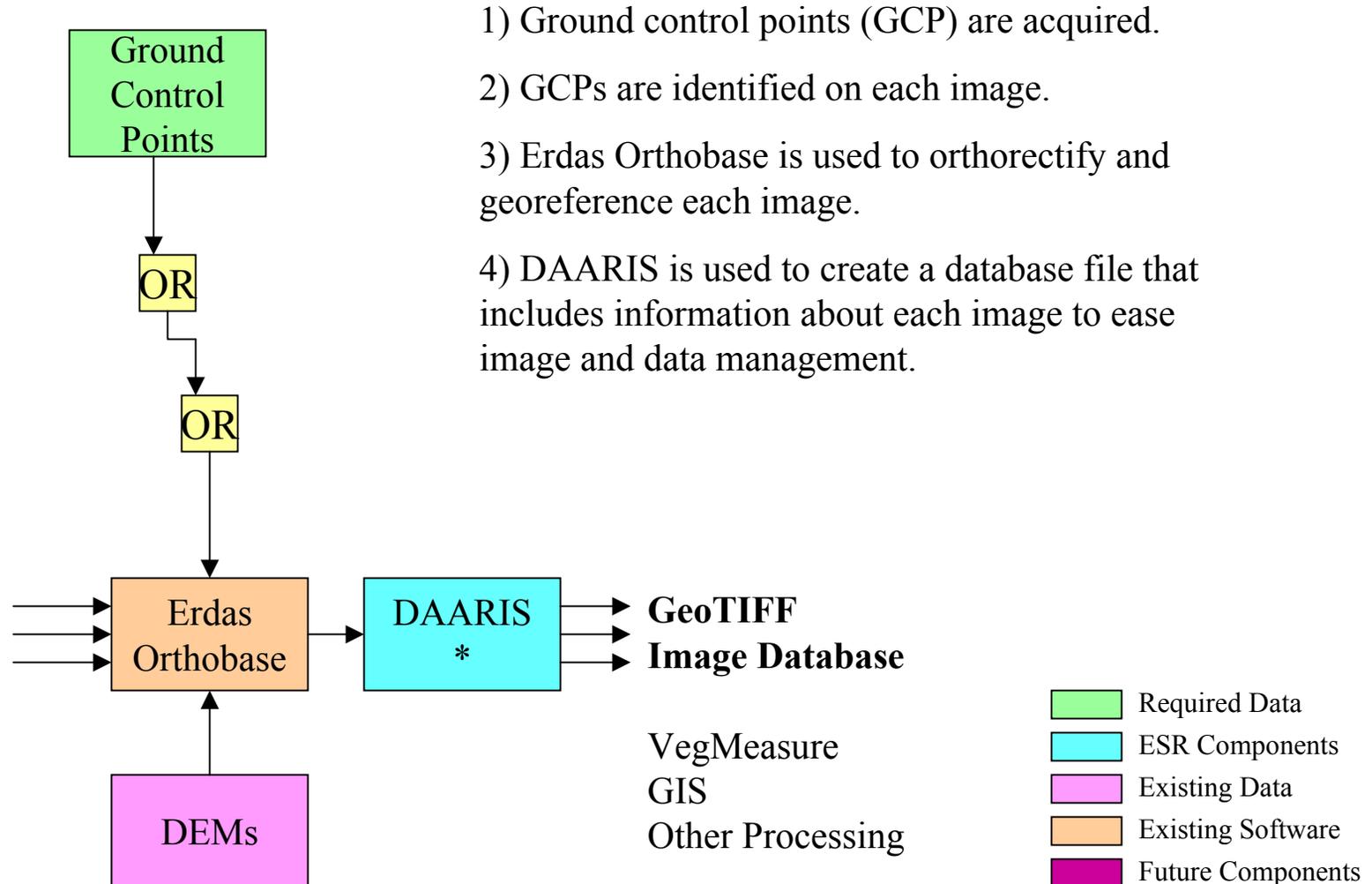
Gyro data post processing to convert data from POS PAC to what Erdas Orthobase requires.

## DAARIS

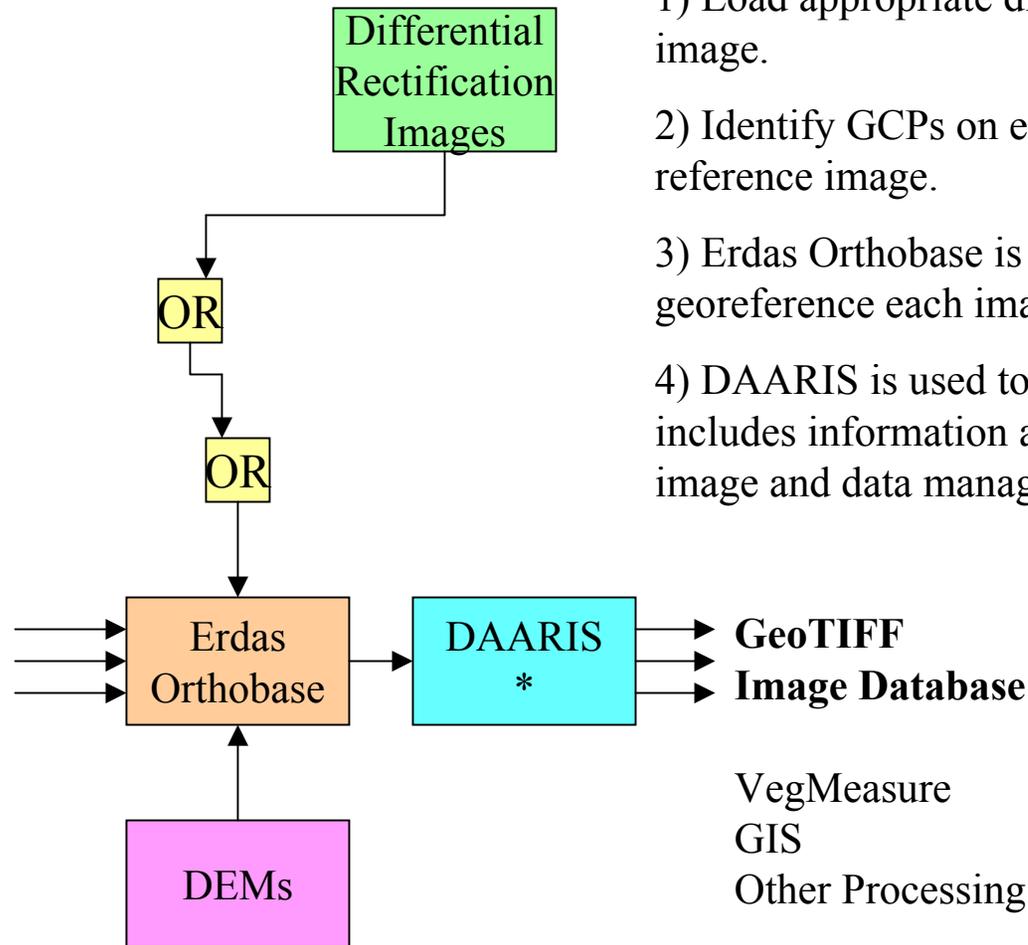
Database creation software.

- Required Data
- ESR Components
- Existing Data
- Existing Software
- Future Components

# Using Ground Control Points



# Using Differential Image Rectification

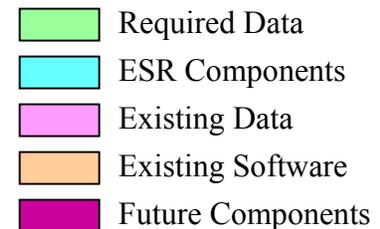


1) Load appropriate differential rectification image.

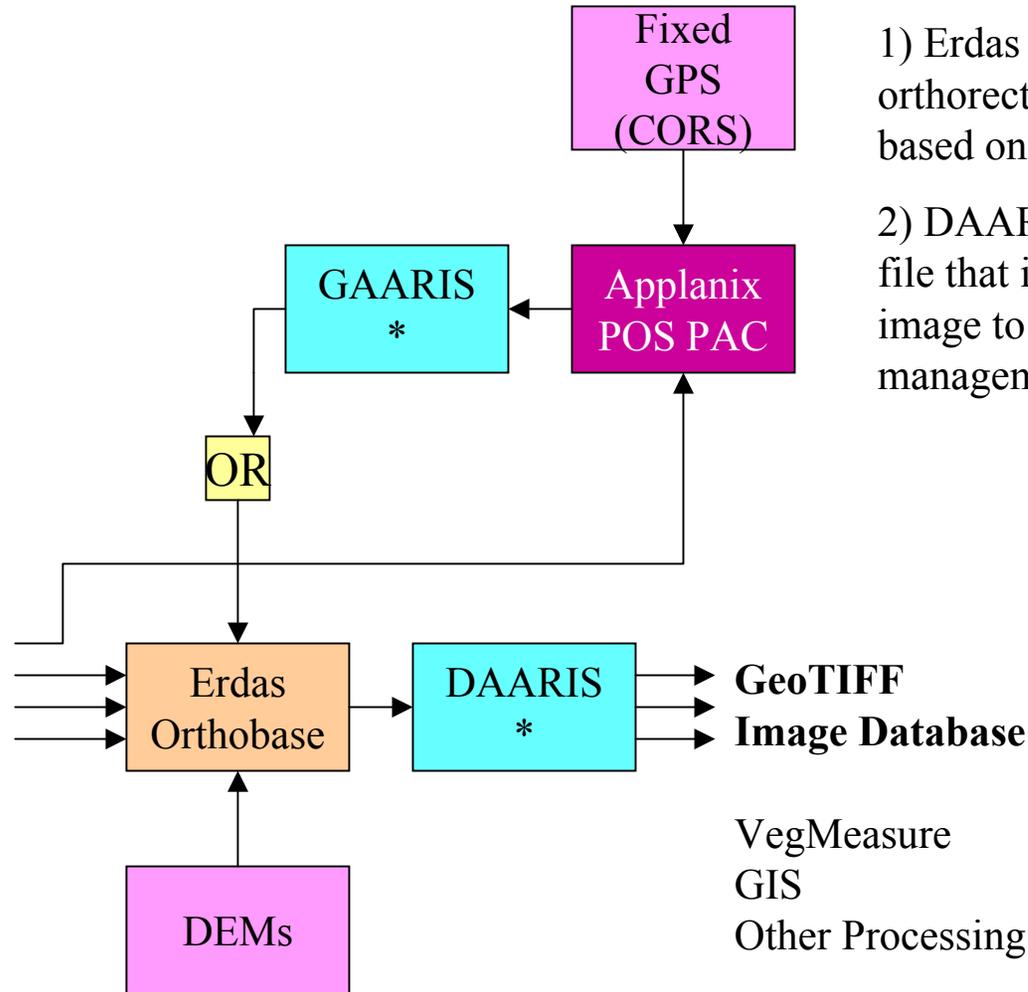
2) Identify GCPs on each acquired image and reference image.

3) Erdas Orthobase is used to orthorectify and georeference each image.

4) DAARIS is used to create a database file that includes information about each image to ease image and data management.



# Automated Direct Georeference



1) Erdas Orthobase is used to orthorectify and georeference each image based on gyro data and DEMs.

2) DAARIS is used to create a database file that includes information about each image to ease image and data management.

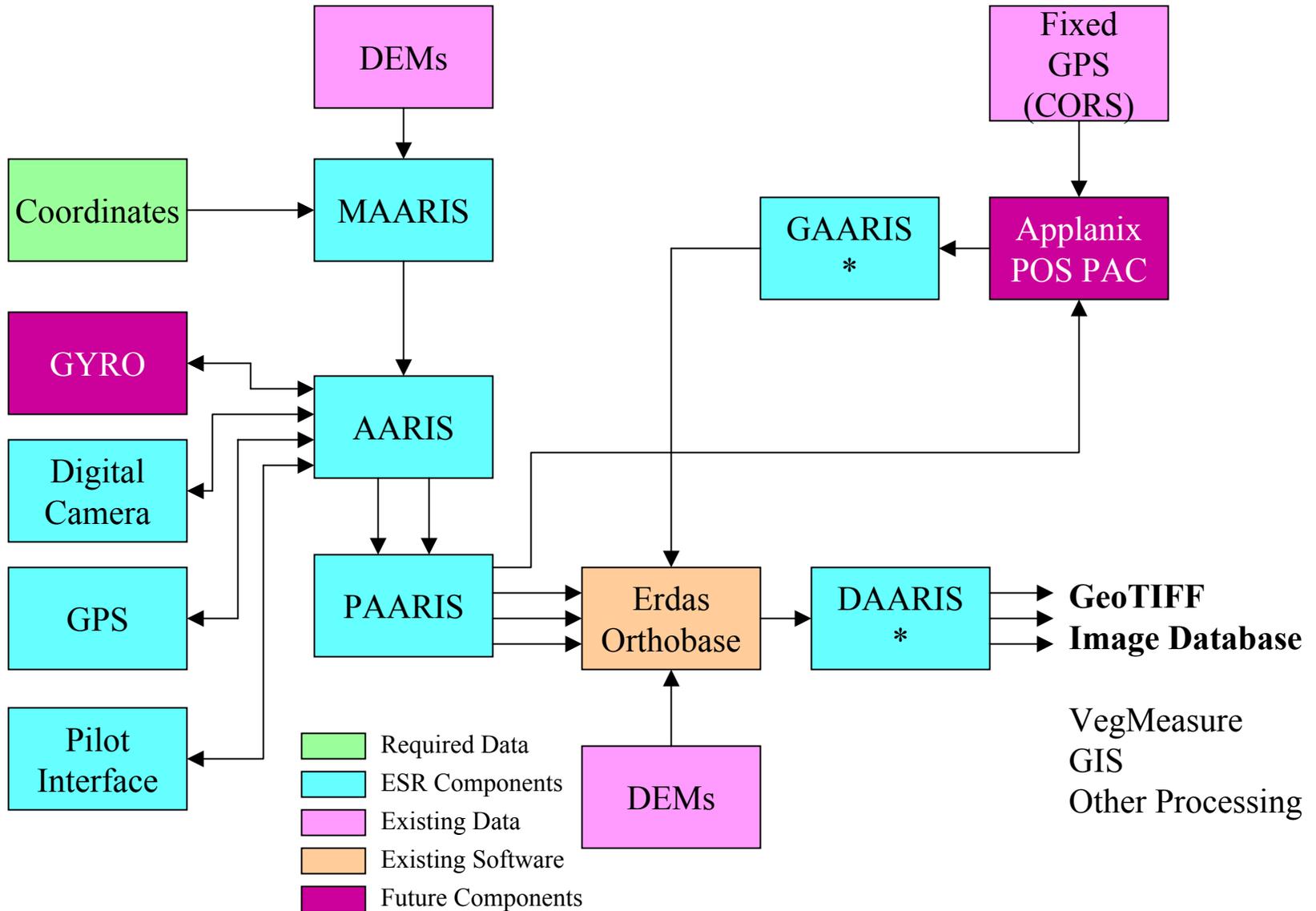
VegMeasure  
GIS  
Other Processing

- Required Data
- ESR Components
- Existing Data
- Existing Software
- Future Components

# Comparison of Rectification Options

Rectification Option	PROS	CONS
Ground Control Points	Low initial cost	Very expensive per image CGPs Manual operation Very long turn around
Differential Rectification	Low initial cost	Expensive per image Manual operation Long turn around
Direct Georeference	Low cost per image Quick turn around	High initial cost to setup

# AARIS Components



# AARIS - Automated Airborne Remote Information System

- **Tune System to Fit Specific Applications**
- **Low Cost**
- **High Quality**
- **Quick Turn Around**
- **Easy To Use Database File**
- **No Copyright, No Restrictions**
- **Pay Only When Images Are Delivered**