

**NAS**software Limited  
Incorporating InfoSAR

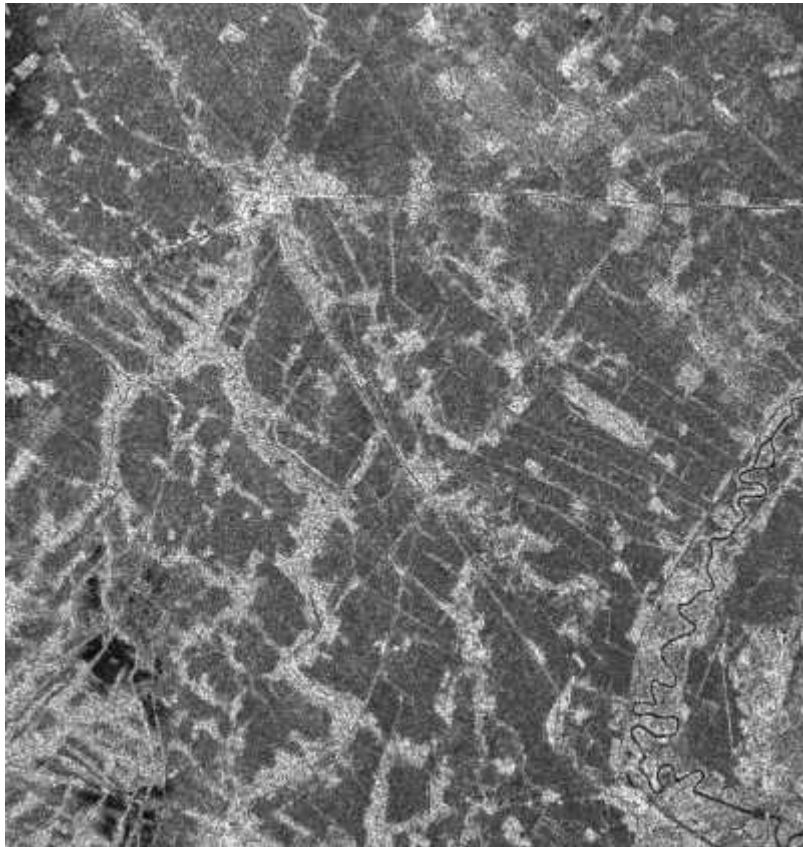
## Rice Mapping

Prof. Chris Oliver, CBE

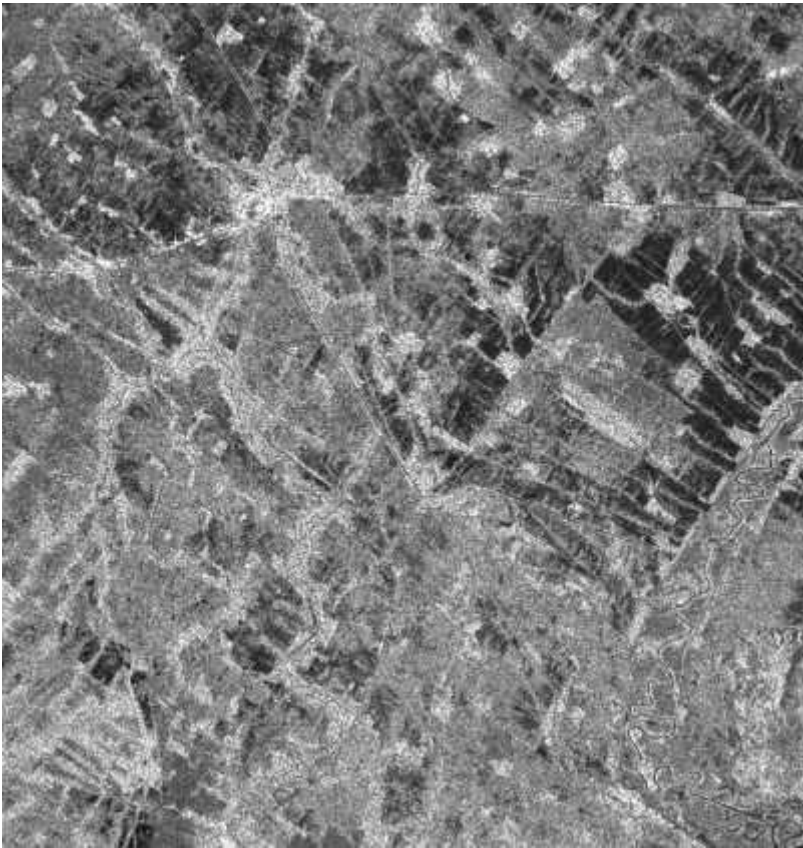
A set of four ERS images of the Demak area of Java were collected in 1994; the first and third of these are shown on the next 2 pages.

The changes between images can be used to identify the presence of rice, and to distinguish between early and late crops. This is typically carried out using a fixed (eg 3\*3) filter as classifier; but substantially better sensitivity is achieved by using an adaptive filter (segmentation) prior to classification of the segmented image. We carry out a joint unsupervised segmentation of all four images, providing a common set of field boundaries, and then classify the segmented images with the results shown below. The accuracy and sensitivity achieved is superior to that obtained by alternative approaches.

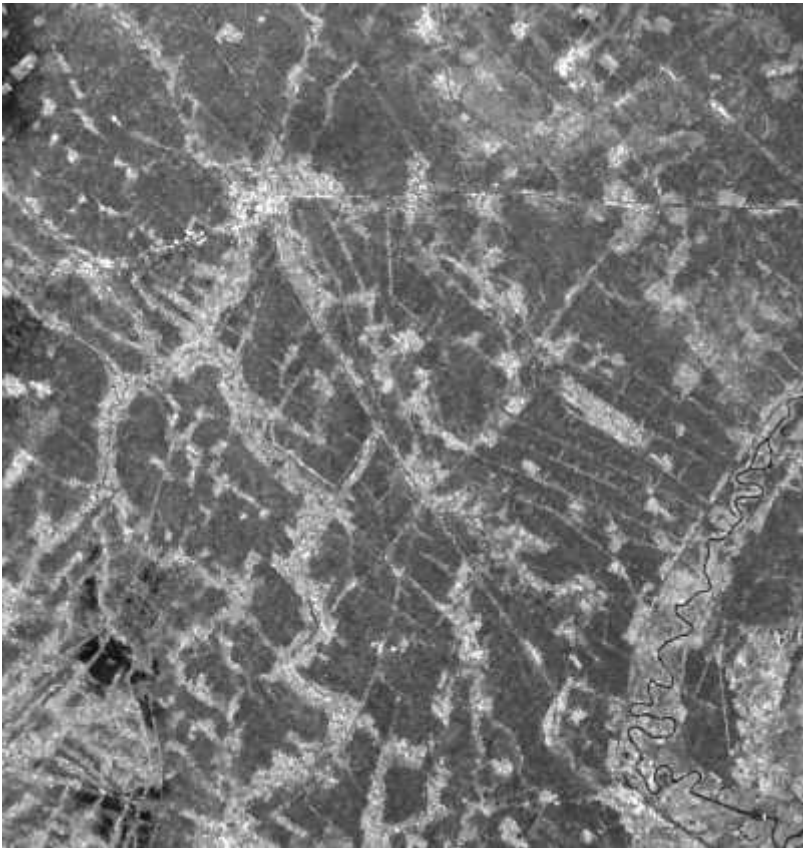
**Original amplitude image 0; The original data has been averaged by a factor two to remove oversampling.**



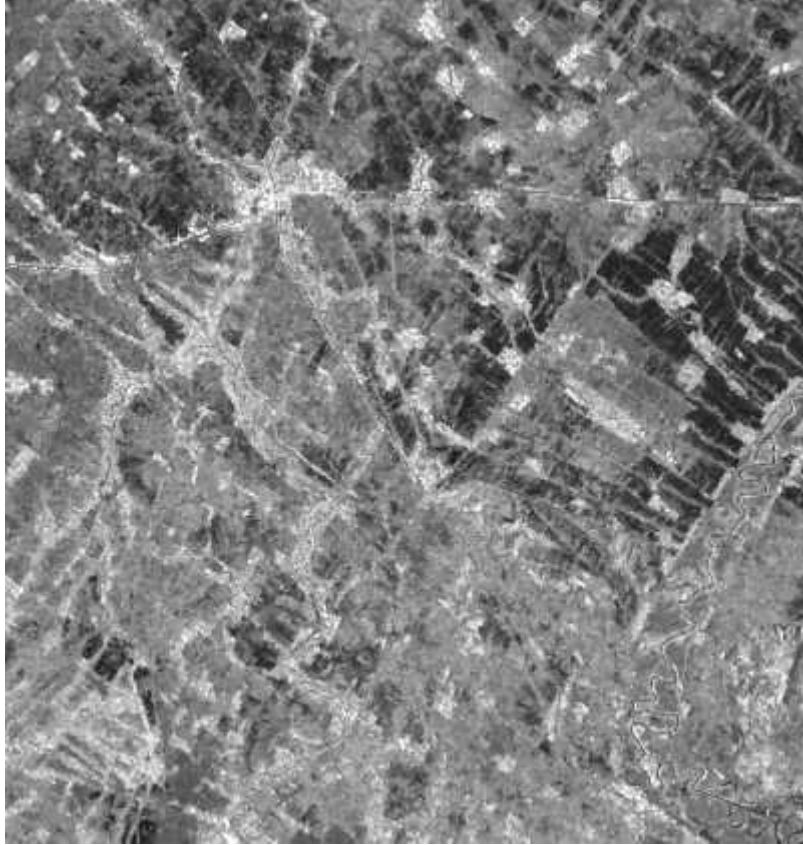
**Original amplitude image 3; The original data has been averaged by a factor two to remove oversampling.**



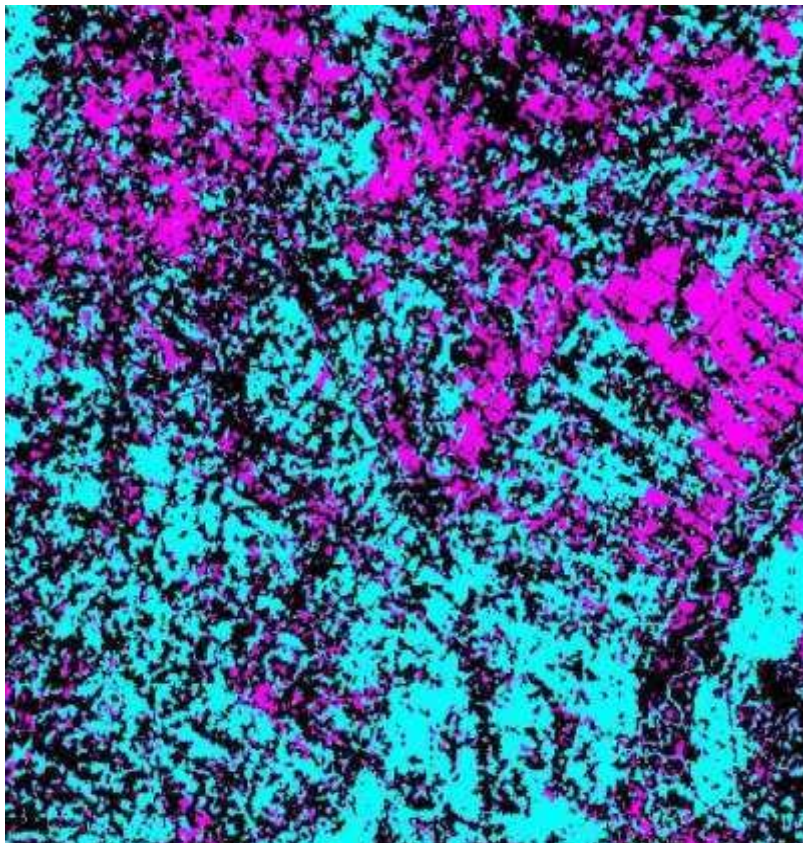
**Joint segmentation; common edge map applied to image 0.**



**Joint segmentation; common edge map applied to image 3.**



**Classification by change detection between segmentations of 0 and 3; magenta denotes early rice, blue denotes late rice, black areas are not rice.**



**Classification by temporal matched filter applied to all four segmented images: magenta denotes early rice, grey denotes late rice, black areas are not rice.**

