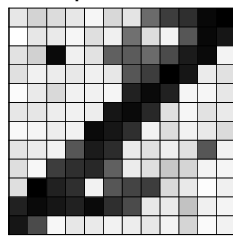


# I) Inputs

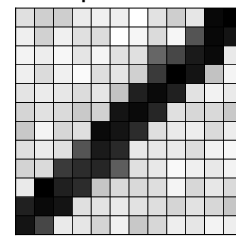
Pre-processed flood images

VH polarization



Pre-processed reference image

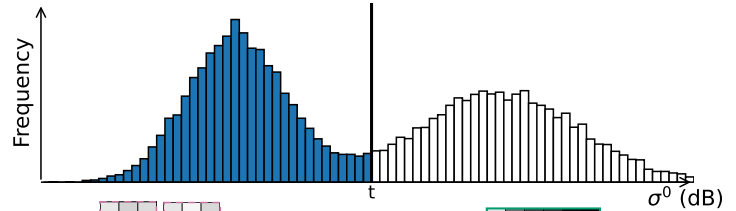
VH polarization



# II) Flood mapping methods

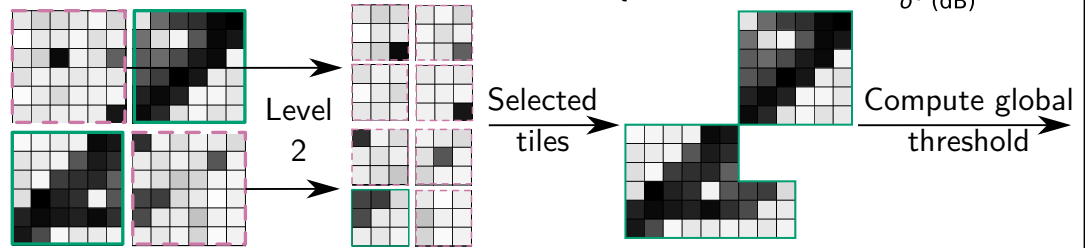
## 1) Global thresholding

- Histogram of VH polarization
- Otsu, or KI method to dichotomize flooded from dry pixels



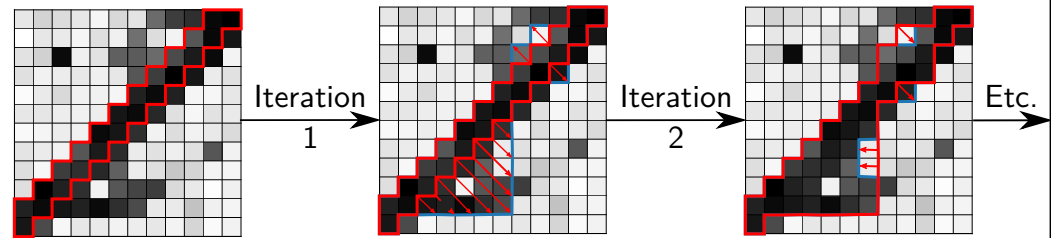
## 2) Local thresholding

- Sub-quadrant decomposition on VH polarization until a minimum quadrant size
- Ashman'D, Battacharrya, and surface ratio coefficients for each sub-tile



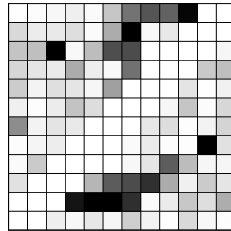
## 3) Active contour model

- Determine or provide (permanent water mask) an initial contour
- Minimize a cost function on contour curve with a smoothness parameter



## 4) Change detection

- Compute logarithmic difference between VH flood and reference images



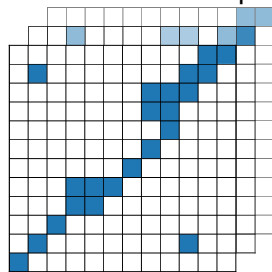
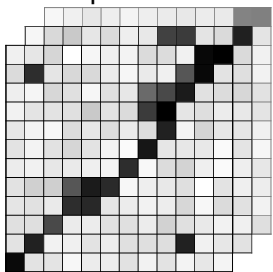
Apply global or local thresholding on the new image, and add permanent water

## 5) Supervised classification

Training dataset: Sen1Floods11

VH polarization

Labeled flood maps



### CNN

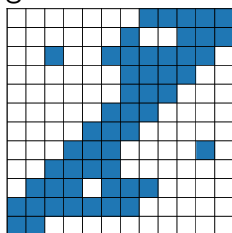
- Generate model weights with training data

### Random Forest

- Generation of other features with textural information (average for each pixel with 3x3, 5x5 and 7x7 windows)
- Training on dataset and new features
- Apply both models to flood image inputs

# III) Flood map

Segmented flood map



# IV) Morphological operations (optional)

-Fill holes and remove unconnected patches below a surface area

