

Supplementary File

A part of the python script for automatic search in the GEE data repository with given location (latitude and longitude) and date are shown below.

```
def Search(locations,delta,cloud,keyword,funcSearch,funcSample,col_lat=4,col_lon=5,col_date=7):
    for datarow in locations[0:1].itertuples():
        print('row number ' + '0')
        img = 'nothing'
        pnt_date = datetime.datetime.strptime(datarow[col_date], '%m/%d/%Y')
        lat = datarow[col_lat]
        lon = datarow[col_lon]
        p1 = ee.Geometry.Point([lon,lat])
        feature1 = ee.Feature(p1)
        feature1 = feature1.set('id',0)
        if datarow[8] != 'ND':
            #search sentinel first
            img = funcSearch(pnt_date,lat,lon,delta,cloud)
            if ImageExist(img) == 'true':
                ac_date = ee.Date(img.get('system:time_start')).format('MM/dd/YYYY');
                print('Found a ' + keyword+ ' image for date:',pnt_date,' at date:', ac_date.getInfo())
                feature1 = feature1.set('ac_date',ac_date.getInfo())
                date1 = datetime.datetime.strptime(ac_date.getInfo(), '%m/%d/%Y')
                dt = date1.date() - pnt_date.date()
                feature1 = feature1.set('date_diff',dt.days)
                feature1 = feature1.set('spacecraft',img.get('SPACECRAFT_NAME').getInfo())
                ft = funcSample(img,feature1,30)
                continue
    count=0
    for datarow in locations[1:].itertuples():
        count = count + 1
        print('row: ' + str(count))
        lat = datarow[col_lat]
        lon = datarow[col_lon]
        pnt_date = datetime.datetime.strptime(datarow[col_date], '%m/%d/%Y')
        p1 = ee.Geometry.Point([lon,lat])
        feature1 = ee.Feature(p1)
        feature1 = feature1.set('id',count)
        if datarow[8] != 'ND':
            #search sentinel first
            img = funcSearch(pnt_date,lat,lon,delta,cloud)
            if ImageExist(img) == 'true':
                ac_date = ee.Date(img.get('system:time_start')).format('MM/dd/YYYY');
                print('Found a ' + keyword+ ' image for date:',pnt_date,' at date:', ac_date.getInfo())
                feature1 = feature1.set('ac_date',ac_date.getInfo())
                date1 = datetime.datetime.strptime(ac_date.getInfo(), '%m/%d/%Y')
                dt = date1.date() - pnt_date.date()
                feature1 = feature1.set('date_diff',dt.days)
                feature1 = feature1.set('spacecraft',img.get('SPACECRAFT_NAME').getInfo())
```

```
ftnew = funcSample(img,feature1,30)
try:
    ft = ft.merge(ftnew)
except:
    ft = ftnew
continue
print('No image was found, skipped')
return ft
```

Figure S1. Python script for automatic search.