//-------------------------------------Region select ------------------------------------

// North America(NA) 30-40 40-50 50-60 60- 70

// Euraisa (EA) 30-35 35-40 40-45 45-49 49-53 53-57 57-62 62-67 67-70

var roi = table;

var exp\_roi = table2

Map.addLayer(roi,{},'roi')

var startYear = 2013;

var endYear = 2021;

function processYear(year) {

if (year > endYear) {

return; // 如果超过了结束年份，停止递归

}

var startDay = ee.Date.fromYMD(year, 1, 1);

var endDay = ee.Date.fromYMD(year + 1, 1, 1);

//----------------- Get Phenological DOY & Deciduous Forests -------------

var MCD12Q1 = ee.ImageCollection("MODIS/061/MCD12Q1")

.filterDate(startDay, endDay)

.select('LC\_Type1')

.mode().clip(roi) //mode value

var zhenyelin = MCD12Q1.eq(3) //Deciduous Needleleaf Forests

var kuoyelin = MCD12Q1.eq(4) //Deciduous Broadleaf Forests:

var hunjiaolin = MCD12Q1.eq(5) //Mixed Forests

var luoyelin = ee.ImageCollection([zhenyelin,kuoyelin,hunjiaolin]).max(); // Deciduous Forests

// Map.addLayer(zhenyelin,{},'zhenyelin')

// Map.addLayer(hunjiaolin,{},'hunjiaolin')

// Map.addLayer(luoyelin,{},'luoyelin')

var a345 = cal\_lst(luoyelin,'\_345')

//---------------------------- Cycle through the target band ----------------------------

var bandNames = [

'Onset\_Greenness\_Increase\_1',

'Date\_Mid\_Greenup\_Phase\_1',

'Onset\_Greenness\_Decrease\_1',

'Onset\_Greenness\_Maximum\_1',

'Date\_Mid\_Senescence\_Phase\_1',

'Onset\_Greenness\_Minimum\_1'

];

// Cycle through the target band

for (var i = 0; i < bandNames.length; i++) {

var currentBandName = bandNames[i];

var phe\_col = ee.ImageCollection('NOAA/VIIRS/001/VNP22Q2')

.filterDate(startDay, endDay)

.filterBounds(roi)

.select(currentBandName)

.map(calDOY)

.map(L\_clip)

// print('phe\_col',phe\_col)

// Map.addLayer(phe\_col, {},'phe\_col');

var phe\_dataset\_image = phe\_col.first()

.clip(roi)

.toInt()

.updateMask(luoyelin)

// print("phe\_dataset\_image", phe\_dataset\_image);

// var visParams = {min: 0, max:366, palette: ['green', 'yellow', 'red']};

// Map.addLayer(phe\_dataset\_image, visParams,'phe\_dataset\_image');

//----------------------------Downscaling----------------------------

var grid = table2

var PHE\_imagegrid = phe\_dataset\_image.reduceRegions({

reducer: ee.Reducer.median(),

collection: grid,

scale: 1000

});

PHE\_imagegrid = PHE\_imagegrid.filter(ee.Filter.notNull(['median']));

var PHE\_IMAGE = ee.Image().float().paint(PHE\_imagegrid, 'median').rename('PHE\_IMAGE');

// Add time and date attributes to the image

// PHE\_IMAGE = PHE\_IMAGE.set('system:time\_start', img.get('system:time\_start'))

// .set('doy',img.get('imageDOY'))

// print('PHE\_IMAGE',PHE\_IMAGE)

// var visParams = {min: 0, max:366, palette: ['green', 'yellow', 'red']};

// Map.addLayer(PHE\_IMAGE, visParams, 'PHE\_IMAGE');

//-------------------------------------Data Output----------------------------------

var exportDescription = year + '-' + currentBandName + '-30-40';

var fileNamePrefix = year + '-' + currentBandName + '-30-40';

Export.image.toDrive({

image: PHE\_IMAGE,

description: exportDescription,

fileNamePrefix: fileNamePrefix,

region: exp\_roi,

folder: 'download\_NA\_PHE',//

scale: 30000,

crs: "EPSG:4326",

maxPixels: 1e13

});

}

processYear(year + 1);

}

processYear(startYear);

// Function2

function calDOY(imageYLD){

var dateYYDDSS = imageYLD.get("system:time\_start")

var strDateYear = ee.Date(dateYYDDSS).format("YYYY");

var startDate = ee.Date('2000');

var endDate = ee.Date(strDateYear)

var intervalDOY = endDate.difference(startDate, 'year').toInt();

var imageDOY = imageYLD.subtract(intervalDOY.multiply(366)).toInt();

return imageDOY.set("system:time\_start", dateYYDDSS)

}

// Function1

function L\_clip (img){return img.clip(roi)}