//-------------------------------------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')

//-------------------------------------Timescale select ---------------------------------

// 2013-2021

var startDay = ee.Date.fromYMD(2013,1,1);

var endDay = ee.Date.fromYMD(2014,1,1);

// // var extractedData = ee.Feature(roi);

//------- Get Land Surface Temperature & 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')

// exportImageCollection(a345)

//Whole Function

function cal\_lst(classimg,sub\_name){

var LST\_dataset= ee.ImageCollection('MODIS/061/MYD11A1')

.filterDate(startDay, endDay)

.select('LST\_Day\_1km','QC\_Day')

.filterBounds(roi)

.map(L\_clip)

//--------------------------------Decloud Processing---------------------------------

var bitwiseExtract = function(input, fromBit, toBit) {

var maskSize = ee.Number(1).add(toBit).subtract(fromBit)

var mask = ee.Number(1).leftShift(maskSize).subtract(1)

return input.rightShift(fromBit).bitwiseAnd(mask)

}

// Bits 0-1 <= 1 (LST produced of both good and other quality)

// Bits 2-3 <= 1 (Good data quality & Other data quality)

// Bits 4-5 Ignore, any value is ok

// Bits 6-7 <= 2 (Average LST error ≤ 3K)

var applyQaMask = function(image) {

var lstDay = image.select('LST\_Day\_1km')

var qcDay = image.select('QC\_Day')

var qaMask = bitwiseExtract(qcDay, 0, 1).lte(1)

var dataQualityMask = bitwiseExtract(qcDay, 2, 3).lte(1)//.eq(0)

var lstErrorMask = bitwiseExtract(qcDay, 6, 7).lte(2) // .eq(0)

var mask = qaMask.and(dataQualityMask).and(lstErrorMask)

return lstDay.updateMask(mask)

}

var LSTMasked = LST\_dataset.map(applyQaMask)

print('LSTMasked',LSTMasked)

//------------------5-day Moving Average Proccessing----------------------------

var LSTMasked\_list = LSTMasked.toList(LSTMasked.size())

var doy = ee.List.sequence(2,362,1);

var LST\_year\_mean\_col = doy.map(function(d){

var d = ee.Number(d)

var img = ee.Image(LSTMasked\_list.get(d));

var dateYMD = img.date();

var date = ee.Date(dateYMD); //////

var year = dateYMD.get('year'); //////

var formattedDOY =dateYMD.format('DDD')

var LST\_doy\_mean = ee.ImageCollection(LSTMasked\_list.slice(d.subtract(2),d.add(3)))

.mean()

.multiply(0.02).subtract(273.15)

.updateMask(classimg);

return LST\_doy\_mean.set('doy',formattedDOY)

.set('system:time\_start',date.millis())

.set('year',year)

.set('date',date);

});

var LST\_year\_mean\_col = ee.ImageCollection(LST\_year\_mean\_col);

print('LST\_year\_mean\_col',LST\_year\_mean\_col);

var rawCol = LST\_year\_mean\_col;

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

var grid = table2//roi.coveringGrid(ee.Projection('EPSG:4326'), 30000)

// .filterBounds(rawCol.geometry())

.filterBounds(roi)

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

var LST\_IMAGE = rawCol.map(function(img){

var lst = img.reduceRegions({

reducer: ee.Reducer.median(),

collection: grid,

scale: 1000

});

lst = lst.filter(ee.Filter.notNull(['median']));

var lstImage = ee.Image().float().paint(lst, 'median').rename('LST');

// Add time and date attributes to the image

lstImage = lstImage.set('system:time\_start', img.get('system:time\_start'))

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

.set('year',img.get('year'))

.set('date',img.get('date'))

var name = ee.String('LST').cat(sub\_name).cat(ee.String('\_')).cat(img.get('doy'))

return lstImage.rename(name);

})

// Map.addLayer(LST\_IMAGE.first(),{},'LST\_IMAGE')

print('LST\_IMAGE',LST\_IMAGE)

return LST\_IMAGE

}

// Function

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

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

var imageCollection = a345;

var colimg = imageCollection.toBands()

print('colimg',colimg)

Export.image.toDrive({

image: colimg.clip(roi),

description: "\_NA\_30-40\_" + 2013,

fileNamePrefix: "\_NA\_30-40\_" + 2013,

region: exp\_roi,

folder: 'download\_NA\_LST',

scale: 30000,

crs: "EPSG:4326",

maxPixels: 1e13

});