**[fkaragulian@sub3 ~]$**

**always include:**

**module load gcc/4.9.2**

**module load R/3.3.2**

**module load netcdf/4.3.2**

**module load gdal/2.1.2**

export PATH=$PATH:/apps/bison/bison-3.0.2/bin:/apps/flex/flex-2.6.0/bin

**to install packages:**

**install.packages('zoo', repos = 'http://cran.us.r-project.org')**

**library("threadr", lib.loc="/disk3/fkaragulian/R/x86\_64-pc-linux-gnu-library/3.3")**

----------------------------------------------------------------------------------------------------

**Set environmental variables**

export PATH=$PATH:/apps/R/R-3.0.2/bin

export LD\_LIBRARY\_PATH=$LD\_LIBRARY\_PATH:/apps/R/R-3.0.2/lib64

------------------------------------------------------------------------------------------------------

**to install packages:**

install.packages('zoo', repos = 'http://cran.us.r-project.org')

--------------------------------------------------------------------------------------------------------------------

Download the .tar file for **RNetCDF**  
  
wget <https://cran.pau.edu.tr/src/contrib/RNetCDF_1.8-2.tar.gz>  
  
Run the below command as R

install.packages("/home/fkaragulian/RNetCDF\_1.8-2.tar.gz",   
repos = NULL,  
type="source",  
dependencies=TRUE,  
configure.args="CPPFLAGS=-I/apps/udunits/udunits-2.2.20/include LDFLAGS=-L/apps/udunits/udunits-2.2.20/lib LIBS=-ludunits2")

Download the .tar file for **rgeos**

wget [https://cran.pau.edu.tr/src/contrib/[rgeos\_0.3-21.tar.gz](https://cran.pau.edu.tr/src/contrib/rgeos_0.3-21.tar.gz)](https://cran.pau.edu.tr/src/contrib/RNetCDF_1.8-2.tar.gz)

install.packages("/home/fkaragulian/[rgeos\_0.3-21.tar.gz](https://cran.pau.edu.tr/src/contrib/rgeos_0.3-21.tar.gz)",   
repos = NULL,  
type="source",  
dependencies=TRUE)

------------------------------------------------------------------------------

Download the .tar file for **rgdal**  
wget [https://cran.pau.edu.tr/src/contrib/[rgdal\_1.2-4.tar.gz](https://cran.pau.edu.tr/src/contrib/rgdal_1.2-4.tar.gz)](https://cran.pau.edu.tr/src/contrib/RNetCDF_1.8-2.tar.gz)

install.packages("/home/fkaragulian/[rgeos\_0.3-21.tar.gz](https://cran.pau.edu.tr/src/contrib/rgeos_0.3-21.tar.gz)",   
repos = NULL,  
type="source",  
dependencies=TRUE)

**install.packages('zoo', repos = 'http://cran.us.r-project.org')**

install.packages("/home/fkaragulian/rgdal\_1.2-4.tar.gz",   
repos = NULL,  
type="source",  
dependencies=TRUE,  
configure.args="CPPFLAGS=-I /apps/proj/proj-4.9.3/ include LDFLAGS=-L/apps/proj/proj-4.9.3/lib LIBS=-lproj")

############## new stuff from Sanyo ###################################################

install.packages('rgdal', repos = '<http://cran.us.r-project.org>', configure.args = '--with-proj-include=/apps/proj/proj-4.9.3/include --with-proj-lib=/apps/proj/proj-4.9.3/lib')

Download the .tar file for **curl**

wget https://cran.pau.edu.tr/src/contrib/[curl\_2.3.tar.gz](https://cran.pau.edu.tr/src/contrib/curl_2.3.tar.gz)

install.packages("/home/fkaragulian/[curl\_2.3.tar.gz](https://cran.pau.edu.tr/src/contrib/curl_2.3.tar.gz)",   
repos = NULL,  
type="source",  
dependencies=TRUE,  
configure.args="CPPFLAGS=-I/apps/curl/curl-7.37.1/include LDFLAGS=-L/apps/curl/ curl-7.37.1/lib LIBS=- curl/libcurl")

install.packages('curl', repos = '<http://cran.us.r-project.org>', configure.args = '--with-curl-include=/apps/curl/curl-7.37.1/include --with-curl-lib=/apps/curl/curl-7.37.1/lib')

bsub -Is -q interactive R  
  
install.packages('curl', repos = '[http://cran.us.r-project.org](http://cran.us.r-project.org/)', configure.args = '--with-curl-include=/apps/curl/curl-7.37.1/include --with-curl-lib=/apps/curl/curl-7.37.1/lib')

Download the .tar file for **raster**  
wget [https://cran.pau.edu.tr/src/contrib/[raster\_2.5-8.tar.gz](https://cran.pau.edu.tr/src/contrib/raster_2.5-8.tar.gz)](https://cran.pau.edu.tr/src/contrib/RNetCDF_1.8-2.tar.gz)

install.packages("/home/fkaragulian/[raster\_2.5-8.tar.gz](https://cran.pau.edu.tr/src/contrib/rgeos_0.3-21.tar.gz)",   
repos = NULL,  
type="source",  
dependencies=TRUE)

Download the .tar file for **gstat**  
wget https://cran.pau.edu.tr/src/contrib/[gstat\_1.1-3.tar.gz](https://cran.pau.edu.tr/src/contrib/gstat_1.1-3.tar.gz)

install.packages("/home/fkaragulian/[gstat\_1.1-3.tar.gz](https://cran.pau.edu.tr/src/contrib/rgeos_0.3-21.tar.gz)",   
repos = NULL,  
type="source",  
dependencies=TRUE)

##############################################################################

for **sub in HPC**

##############################################################################

install.packages('stringi', repos = '<http://cran.us.r-project.org>', configure.args = '--with-lib64-include=/usr/lib64/include --with-lib64=/usr/lib64')

install.packages('stringr', repos = '<http://cran.us.r-project.org>', configure.args = '--with-lib64-include=/usr/lib64/include --with-lib64=/usr/lib64')

install.packages('tibble', repos = '<http://cran.us.r-project.org>', configure.args = '--with-lib64-include=/usr/lib64/include --with-lib64=/usr/lib64')

install.packages('dplyr', repos = '<http://cran.us.r-project.org>', configure.args = '--with-lib64-include=/usr/lib64/include --with-lib64=/usr/lib64')

**install.packages('readr', repos = 'http://cran.us.r-project.org')**

----------------------------------------

**Installing libjepeg on the HPC**

Download and unzip tar file

cd /disk3/fkaragulian/libjpeg/jpeg-8/

./configure --prefix=/disk3/fkaragulian/libjpeg/jpeg-8/

make

make install

---------------------------------------

**Installing zlib**

Download and unzip tar file

cd /disk3/fkaragulian/zlib/zlib-1.2.5/

./configure --prefix=/disk3/fkaragulian/zlib/zlib-1.2.5/

make

make install

---------------------------------------

**Installing HDF4 on the HPC**

mkdir /home/fkaragulian/hdf4/

cd /home/fkaragulian/hdf4/

wget https://support.hdfgroup.org/ftp/HDF/releases/HDF4.2.12/src/[hdf-4.2.12.tar.bz2](https://support.hdfgroup.org/ftp/HDF/releases/HDF4.2.12/src/hdf-4.2.12.tar.bz2)

tar -xvf hdf-4.2.12.tar.bz2

cd /home/fkaragulian/hdf4/hdf-4.2.12

module load gcc/4.9.2

export PATH=$PATH:/apps/bison/bison-3.0.2/bin:/apps/flex/flex-2.6.0/bin

./configure --prefix=/home/fkaragulian/hdf4/hdf-4.2.12 --disable-netcdf --disable-fortran --enable-cxx --with-zlib=/home/fkaragulian/zlib/zlib-1.2.5 --with-szlib=/apps/szip/szip-2.1 --with-jpeg=/home/fkaragulian/libjpeg/jpeg-8 LDFLAGS="-L/apps/bison/bison-3.0.2/lib -L/apps/flex/flex-2.6.0/lib" CPPFLAGS="-I/apps/flex/flex-2.6.0/include"

**………without szip**……

./configure --prefix=/home/fkaragulian/hdf4/hdf-4.2.12 --disable-fortran --enable-cxx --with-zlib=/home/fkaragulian/zlib/zlib-1.2.5 --with-jpeg=/home/fkaragulian/libjpeg/jpeg-8 LDFLAGS="-L/apps/bison/bison-3.0.2/lib -L/apps/flex/flex-2.6.0/lib" CPPFLAGS="-I/apps/flex/flex-2.6.0/include" --enable-shared

**………without szip……and netcdf…disable fortran…**

./configure --prefix=/home/fkaragulian/hdf4/hdf-4.2.12 --disable-netcdf --disable-fortran --enable-cxx --with-zlib=/home/fkaragulian/zlib/zlib-1.2.5 --with-jpeg=/home/fkaragulian/libjpeg/jpeg-8 LDFLAGS="-L/apps/bison/bison-3.0.2/lib -L/apps/flex/flex-2.6.0/lib" CPPFLAGS="-I/apps/flex/flex-2.6.0/include" --enable-shared

make

make install

**Installing phyton library**

export PATH=/apps/zlib/zlib-1.2.8/bin:/apps/berkeleydb/bsddb-4.8.30/bin:/apps/bzip2/bzip2-1.0.5/bin:/apps/readline/readline-6.3/bin:/apps/ncurses/ncurses-5.9/bin:/apps/ssl/openssl-1.0.2/bin:/apps/sqlite/sqlite-3080802/bin:/apps/tcl/tcl8.5.8/bin:$PATH

export LDFLAGS="-L/apps/zlib/zlib-1.2.8/lib -L/apps/berkeleydb/bsddb-4.8.30/lib -L/apps/bzip2/bzip2-1.0.5/lib -L/apps/readline/readline-6.3/lib -L/apps/ncurses/ncurses-5.9/lib -L/apps/ssl/openssl-1.0.2/lib -L/apps/sqlite/sqlite-3080802/lib -L/apps/tcl/tcl8.5.8/lib"

export CPPFLAGS="-I/apps/zlib/zlib-1.2.8/include -I/apps/berkeleydb/bsddb-4.8.30/include -I/apps/bzip2/bzip2-1.0.5/include -I/apps/readline/readline-6.3/include -I/apps/ncurses/ncurses-5.9/include -I/apps/ssl/openssl-1.0.2/include -I/apps/sqlite/sqlite-3080802/include -I/apps/tcl/tcl8.5.8/include"

export CXXFLAGS=$CPPFLAGS

export CFLAGS=$CPPFLAGS

export LD\_LIBRARY\_PATH=/apps/zlib/zlib-1.2.8/lib:/apps/berkeleydb/bsddb-4.8.30/lib:/apps/bzip2/bzip2-1.0.5/lib:/apps/readline/readline-6.3/lib:/apps/ncurses/ncurses-5.9/lib:/apps/ssl/openssl-1.0.2/lib:/apps/sqlite/sqlite-3080802/lib:/apps/tcl/tcl8.5.8/lib

export LD\_RUN\_PATH=$LD\_LIBRARY\_PATH

cd /disk3/fkaragulian/python/

tar -xvf Python-2.7.3.tar.bz2

cd /disk3/fkaragulian/python/Python-2.7.3

./configure --prefix=/disk3/fkaragulian/python/Python-2.7.3/ --enable-shared

make

make install

**Installing gdal library with the inclusion of HDF4**

cd /disk3/fkaragulian/gdal/

wget <http://download.osgeo.org/gdal/2.1.2/gdal-2.1.2.tar.gz>

tar -xvf gdal-2.1.2.tar.gz

cd /disk3/fkaragulian/gdal/gdal-2.1.2

export PATH=/home/fkaragulian/python/Python-2.7.3/bin:$PATH

export LD\_LIBRARY\_PATH=/home/fkaragulian/python/Python-2.7.3/lib:$LD\_LIBRARY\_PATH

export PATH=/home/fkaragulian/hdf4/hdf-4.2.12/bin/:$PATH

export LD\_LIBRARY\_PATH=/home/fkaragulian/hdf4/hdf-4.2.12/lib:$LD\_LIBRARY\_PATH

export PATH=/apps/netcdf/netcdf-4.3.2/bin:$PATH

export LD\_LIBRARY\_PATH=/apps/netcdf/netcdf-4.3.2/lib:$LD\_LIBRARY\_PATH

./configure --prefix=/disk3/fkaragulian/gdal/gdal-2.1.2/ --with-png=/apps/libpng/libpng-1.4.13 --with-hdf5=/apps/hdf5/hdf5-1.8.13 --with-hdf4=/disk3/fkaragulian/hdf4/hdf-4.2.12/ --with-jpeg=/home/fkaragulian/libjpeg/jpeg-8 --with-netcdf=/apps/netcdf/netcdf-4.3.2 --with-expat=/apps/expat/expat-2.0.1 --with-curl=/apps/curl/curl-7.37.1 --with-xml2=/apps/libxml/libxml2-2.9.4 --with-python=/disk3/fkaragulian/python/Python-2.7.3/bin/python --with-static-proj4=/apps/proj/proj-4.9.3 --with-libtiff=/home/fkaragulian/libtiff/tiff-4.0.7/ --with-geotiff=/home/fkaragulian/libgeotiff/libgeotiff-1.4.2/ --enable-shared

**without netcdf……**

./configure --prefix=/disk3/fkaragulian/gdal/gdal-2.1.2/ --with-png=/apps/libpng/libpng-1.4.13 --with-hdf5=/apps/hdf5/hdf5-1.8.13 --with-hdf4=/disk3/fkaragulian/hdf4/hdf-4.2.12/ --with-jpeg=/home/fkaragulian/libjpeg/jpeg-8 --with-expat=/apps/expat/expat-2.0.1 --with-curl=/apps/curl/curl-7.37.1 --with-xml2=/apps/libxml/libxml2-2.9.4 --with-python=/disk3/fkaragulian/python/Python-2.7.3/bin/python --with-static-proj4=/apps/proj/proj-4.9.3 --with-libtiff=/home/fkaragulian/libtiff/tiff-4.0.7/ --with-geotiff=/home/fkaragulian/libgeotiff/libgeotiff-1.4.2/ --enable-shared

**internal-libtiff, geotif, jpeg**

./configure --prefix=/disk3/fkaragulian/gdal/gdal-2.1.2/ --with-netcdf=/apps/netcdf/netcdf-4.3.2 --with-expat=/apps/expat/expat-2.0.1 --with-libtiff=internal --with-geotiff=internal --with-jpeg=internal --with-png=/apps/libpng/libpng-1.4.13 --with-hdf5=/apps/hdf5/hdf5-1.8.13 --with-hdf4=/disk3/fkaragulian/hdf4/hdf-4.2.12/ --with-curl=/apps/curl/curl-7.37.1 --with-xml2=/apps/libxml/libxml2-2.9.4 --with-python=/disk3/fkaragulian/python/Python-2.7.3/bin/python --with-static-proj4=/apps/proj/proj-4.9.3 --enable-shared

make

make install

export PATH /disk3/fkaragulian/gdal/gdal-2.1.2/:$PATH

export PATH /disk3/fkaragulian/hdf4/hdf-4.2.12/:$PATH

------------------------------------------------------------------------

grep("hdf4", gdalDrivers()$name, ignore.case = TRUE, value = TRUE)

sds <- get\_subdatasets('/full/path/to/file.hdf')   
# translate first subdataset of hdf file to tiff   
gdal\_translate(sds[1], dst\_dataset = 'out.tif')   
r <- raster('out.tif')

###### ###### ########

**gdal\_translate** example

*in windows cmd….*

cd MI Drive\MODIS\_AOD\2016\363

gdalinfo MOD04\_L2.A2016363.0740.006.NRT.hdf

gdal\_translate -of GTiff -sds HDF4\_EOS:EOS\_SWATH:MOD04\_L2.A2016363.0730.006.NRT.hdf:mod04:AOD\_550\_Dark\_Target\_Deep\_Blue\_Combined out.tif

*in UNIX command line….*

gdal\_translate -of GTiff -sds HDF4\_EOS:EOS\_SWATH:/disk3/fkaragulian/MODIS\_AOD/2016/363/MOD04\_L2.A2016363.0730.006.NRT.hdf:mod04:AOD\_550\_Dark\_Target\_Deep\_Blue\_Combined /disk3/fkaragulian/MODIS\_AOD/out.tif

gdalinfo /disk3/fkaragulian/MODIS\_AOD/2016/363/MOD04\_L2.A2016363.0730.006.NRT.hdf

gdal\_translate -of GTiff -sds HDF4\_EOS:EOS\_SWATH:/disk3/fkaragulian/MODIS\_AOD/2016/363/MOD04\_L2.A2016363.0730.006.NRT.hdf:mod04:AOD\_550\_Dark\_Target\_Deep\_Blue\_Combined /disk3/fkaragulian/MODIS\_AOD/out.tif

gdal\_translate -of GTiff -sds /disk3/fkaragulian/MODIS\_AOD/2016/363/MOD04\_L2.A2016363.0730.006.NRT.hdf out.tif

Case of HDF4 seems more difficult and its linked to the version of HDF4 library selected to built GDAL (libhdf4g-dev => KO only with HDF4\_EOS files and libhdf4g-alt-dev => OK).

dpkg -i foo.deb

**library(gdalUtils)**

**library(rgdal)**

hdf4\_dataset <- system.file("external/test\_modis.hdf", package="gdalUtils")

gdal\_translate(hdf4\_dataset,"test\_modis\_sd1.tif", sd\_index=1)

hdf4\_dataset <- "/disk3/fkaragulian/MODIS\_AOD/2016/364/MOD04\_L2.A2016364.0640.006.NRT.hdf"

hdf4\_dataset <- "/disk3/fkaragulian/MODIS\_AOD/2016/364/test\_modis.hdf"

gdal\_translate(hdf4\_dataset,"test\_modis\_sd1.tif", sd\_index=1)

gdal\_translate(hdf4\_dataset, filename, sd\_index = 64)

filename <- "/disk3/fkaragulian/MODIS\_AOD/out.tif"

gdal\_translate("/disk3/fkaragulian/MODIS\_AOD/2016/364/MOD04\_L2.A2016364.0640.006.NRT.hdf", "out.tif", sd\_index=64)

library(gdalUtils)

band=1

system(paste0('gdal\_translate ', get\_subdatasets("/disk3/fkaragulian/MODIS\_AOD/2016/363/MOD04\_L2.A2016363.0730.006.NRT.hdf")[64],' myfile\_', band,'.tif'))

system(paste0('gdal\_translate ', get\_subdatasets("/disk3/fkaragulian/MODIS\_AOD/2016/363/MOD04\_L2.A2016363.0730.006.NRT.hdf")[64],' myfile\_', band,'.tif'))

######## ###### ######## ####### ########

**libtiff**

./configure --prefix=/home/fkaragulian/libtiff/tiff-4.0.7/

make

make install

**libgeotiff**

./configure --prefix=/home/fkaragulian/libgeotiff/libgeotiff-1.4.2/ --with-libtiff=/home/fkaragulian/libtiff/tiff-4.0.7/ -with-proj=/apps/proj/proj-4.9.3 --enable-shared --with-jpeg=/home/fkaragulian/libjpeg/jpeg-8 --with-zlib=/home/fkaragulian/zlib/zlib-1.2.5 --with-zip=/apps/szip/szip-2.1

**Installed FWTolls library**

export PATH=/home/fkaragulian/FWtools/FWTools-2.0.6/bin/:$PATH

export LD\_LIBRARY\_PATH=/home/fkaragulian/FWtools/FWTools-2.0.6/lib/:$LD\_LIBRARY\_PATH

**Install libtiff4-dev**

cd /home/fkaragulian/hdf4/

wget https://support.hdfgroup.org/ftp/HDF/releases/HDF4.2.12/src/[hdf-4.2.12.tar.bz2](https://support.hdfgroup.org/ftp/HDF/releases/HDF4.2.12/src/hdf-4.2.12.tar.bz2)

tar -xvf hdf-4.2.12.tar.bz2