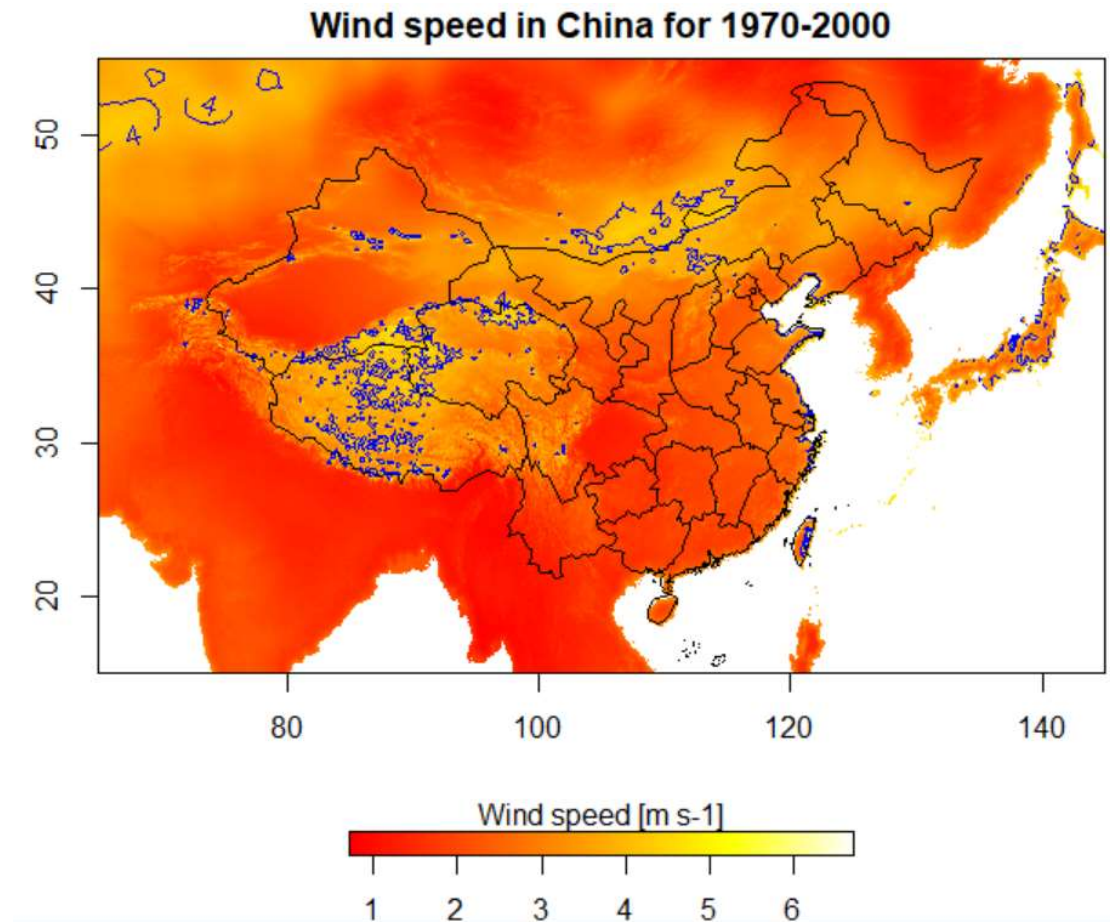


Homework#5

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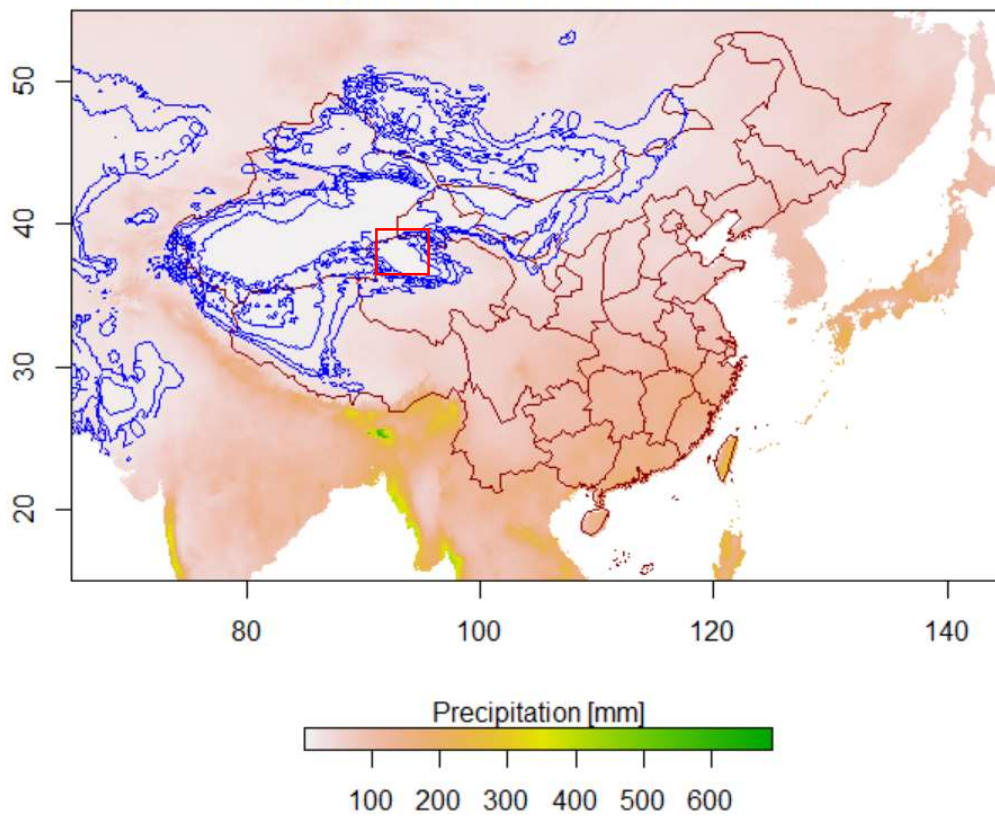
Problem#1

Do average to 12 tiff pictures, each of which represents the monthly Wind speed, Solar radiation and Precipitation.

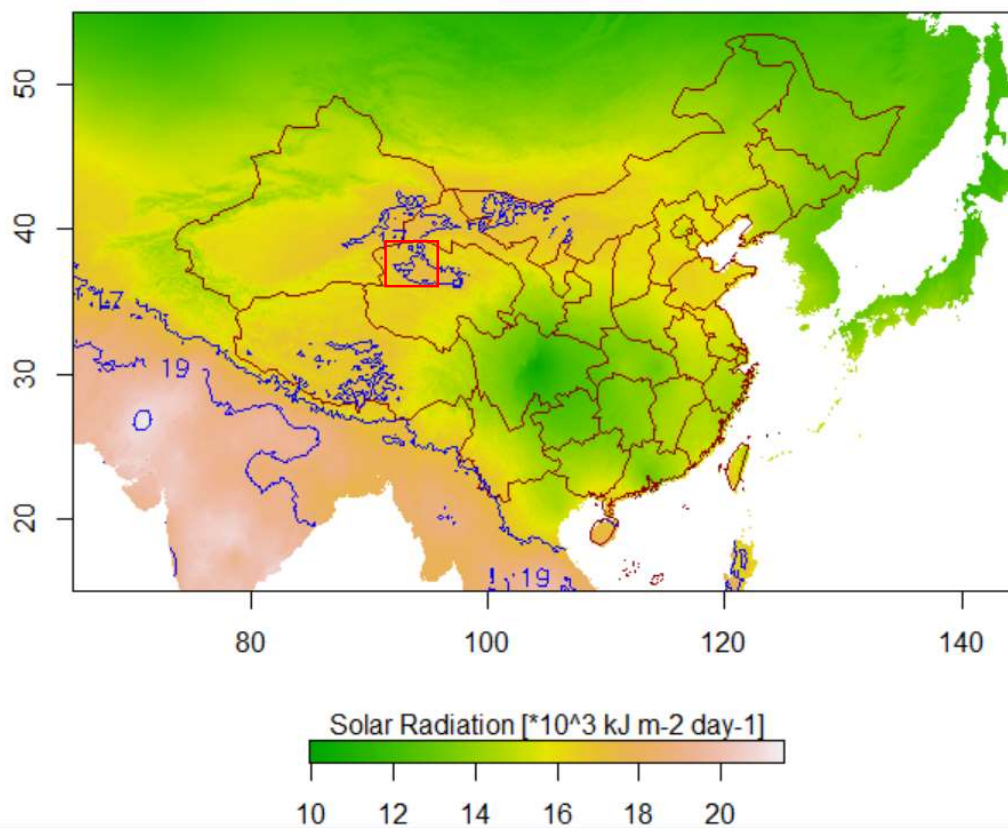


From the graph above, the threshold could be 4 m s^{-1} where part of inner Mongolia, Qinghai, Tibet and Xinjiang can hold the wind farm.

Precipitation in China for 1970-2000



Solar radiation in China for 1970-2000



From the two graphs, I mark my favorite spot of my PV farm, where the precipitation is less than 5 mm per month and with abundant solar radiation of larger than $17000 \text{ kJ m}^{-2} \text{ day}^{-1}$.

It is in the northern-west part of Qinghai province, where there are many PV farm in Qinghai. The news show that concentrated PV power generation in Qinghai accounted for 8.49% of the China proportion, ranking first in China. ^[1] This is in accordant with my choice.
[1]<https://www.china5e.com/news/news-1095599-1.html>

Problem#2

Direct to home:

```
[ese-lix@login03 ~]$ cd ~
[ese-lix@login03 ~]$ ll
total 2
drwxr-xr-x  2 root      root      4096 Sep 26 15:20 billing_report
drwxr-xr-x 10 ese-lix   ese-ouycc 4096 Nov 24 20:36 data_demo
drwxr-xr-x  2 ese-lix   ese-ouycc 4096 Nov  5 21:04 exam
drwxr----- 2 ese-lix   ese-ouycc 4096 Nov 24 20:01 tttt
```

2.1 Make a link called data_demo_link to data_demo folder using ln

```
[ese-lix@login03 ~]$ mkdir data_demo_link/
[ese-lix@login03 ~]$ ll
total 3
drwxr-xr-x  2 root      root      4096 Sep 26 15:20 billing_report
drwxr-xr-x 10 ese-lix   ese-ouycc 4096 Nov 24 20:36 data_demo
drwxr-xr-x  2 ese-lix   ese-ouycc 4096 Nov 29 21:45 data_demo_link
drwxr-xr-x  2 ese-lix   ese-ouycc 4096 Nov  5 21:04 exam
drwxr----- 2 ese-lix   ese-ouycc 4096 Nov 24 20:01 tttt
[ese-lix@login03 ~]$ ln -s data_demo/ data_demo_link/
[ese-lix@login03 ~]$ ll
total 3
drwxr-xr-x  2 root      root      4096 Sep 26 15:20 billing_report
drwxr-xr-x 10 ese-lix   ese-ouycc 4096 Nov 24 20:36 data_demo
drwxr-xr-x  2 ese-lix   ese-ouycc 4096 Nov 29 21:45 data_demo_link
drwxr-xr-x  2 ese-lix   ese-ouycc 4096 Nov  5 21:04 exam
drwxr----- 2 ese-lix   ese-ouycc 4096 Nov 24 20:01 tttt
[ese-lix@login03 ~]$ cd data_demo_link/
[ese-lix@login03 data_demo_link]$ ll
total 1
lrwxrwxrwx 1 ese-lix   ese-ouycc 10 Nov 29 21:45 data_demo -> data_demo/
[ese-lix@login03 data_demo_link]$
```

2.2 Go to data_demo/data/, make an empty file planets.txt_1st with touch.

```
[ese-lix@login03 data]$ touch planets.txt_1st
[ese-lix@login03 data]$ ll
total 261
-rw-r--r--  1 ese-lix   ese-ouycc   283 Nov 19 19:18 amino-acids.txt
drwxr-xr-x  2 ese-lix   ese-ouycc 4096 Nov 19 19:18 animal-counts
-rw-r--r--  1 ese-lix   ese-ouycc   136 Nov 19 19:18 animals.txt
drwxr-xr-x  2 ese-lix   ese-ouycc 4096 Nov 19 19:18 elements
-rw-r--r--  1 ese-lix   ese-ouycc    0 Nov 26 19:40 err.log
-rw-r--r--  1 ese-lix   ese-ouycc 1727 Nov 26 19:40 job.log
-rw-r--r--  1 ese-lix   ese-ouycc   313 Nov 26 19:39 job.sh
-rw-r--r--  1 ese-lix   ese-ouycc   554 Nov 19 19:18 morse.txt
drwxr-xr-x  2 ese-lix   ese-ouycc 4096 Nov 26 20:49 pdb
-rw-r--r--  1 ese-lix   ese-ouycc 8898 Nov 19 19:18 planets.txt
-rw-r--r--  1 ese-lix   ese-ouycc    0 Nov 29 22:38 planets.txt_1st
-rw-r--r--  1 ese-lix   ese-ouycc    64 Nov 26 19:40 result.log
-rw-r--r--  1 ese-lix   ese-ouycc    45 Nov 19 19:18 salmon.txt
-rw-r--r--  1 ese-lix   ese-ouycc 73861 Nov 19 19:18 sunspot.txt
-rw-r--r--  1 ese-lix   ese-ouycc    0 Nov 26 19:44 t1.R
```

2.3 Print your home directory using echo.

```
[ese-lix@login03 data]$ echo `pwd`
/work/ese-lix/data_demo/data
```

2.4 Find how many files in data_demo/data/pdb/ using find.

```
[ese-lixc@login03 pdb]$ find . -type f|wc -l
51
```

2.5 Count how many C character appears
in data_demo/data/pdb/tnt.pdb with grep.

```
[ese-lixc@login03 pdb]$ grep -o "C" tnt.pdb
C
C
C
C
C
C
C
C
C
C
[ese-lixc@login03 pdb]$ grep -o "C" tnt.pdb|wc -l
10
```

2.6 Compare data_demo/data/pdb/ethane.pdb and data_demo/data/pdb/ethanol.pdb with diff

```
[ese-lixc@login03 pdb]$ diff ethane.pdb ethanol.pdb -y -W 50
COMPND      ETHANE      | COMPND      ETHANOL
AUTHOR      DAVE WOOD   | AUTHOR      DAVE WOOD
ATOM        1  C        | ATOM        1  C
ATOM        2  C        | ATOM        2  O
ATOM        3  H        | ATOM        3  H
ATOM        4  H        | ATOM        4  H
ATOM        5  H        | ATOM        5  H
ATOM        6  H        | ATOM        6  C
ATOM        7  H        | ATOM        7  H
ATOM        8  H        | ATOM        8  H
TER          9          | ATOM        9  H
                > TER          10
END           END
```


2.7 Check the total file size of the data_demo folder using du.

```
[ese-lix@login03 ~]$ du -c data_demo
4      data_demo/molecules
1      data_demo/writing/tools/old
2      data_demo/writing/tools
1281   data_demo/writing/data
1      data_demo/writing/thesis
1285   data_demo/writing
1      data_demo/lxctest2/t1
2      data_demo/lxctest2
1      data_demo/t1
2050   data_demo/north-pacific-gyre/2012-07-03
2051   data_demo/north-pacific-gyre
1      data_demo/TEST/TEST/t1
2      data_demo/TEST/TEST
4      data_demo/TEST
2      data_demo/creatures
409    data_demo/data/pdb
52     data_demo/data/elements
1      data_demo/data/animal-counts
722    data_demo/data
4200   data_demo
4200   total
```

2.8 Copy the data_demo folder to data_demo_new, compress it using zip, and decompress the .zip file with unzip.

```
[ese-lix@login03 ~]$ cd data_demo_new
[ese-lix@login03 data_demo_new]$ ll
total 1
drwxr-xr-x 10 ese-lix ese-ouycc 4096 Nov 24 20:36 data_demo
[ese-lix@login03 data_demo_new]$ zip -q -r data_demo.zip ./
[ese-lix@login03 data_demo_new]$ ll
total 1
drwxr-xr-x 10 ese-lix ese-ouycc 4096 Nov 24 20:36 data_demo
-rw-r--r--  1 ese-lix ese-ouycc 585506 Nov 30 20:57 data_demo.zip
[ese-lix@login03 data_demo_new]$ unzip -o -d ./ data_demo.zip
Archive:  data_demo.zip
  extracting: ./data_demo/test.R
    inflating: ./data_demo/molecules/methane.pdb
    inflating: ./data_demo/molecules/pentane.pdb
    inflating: ./data_demo/molecules/cubane.pdb
    inflating: ./data_demo/molecules/ethane.pdb
    inflating: ./data_demo/molecules/propane.pdb
    inflating: ./data_demo/molecules/octane.pdb
    inflating: ./data_demo/solar.pdf
    inflating: ./data_demo/writing/haiku.txt
  extracting: ./data_demo/writing/tools/stats
  extracting: ./data_demo/writing/tools/old/oldtool
    inflating: ./data_demo/writing/tools/format
    inflating: ./data_demo/writing/data/one.txt
    inflating: ./data_demo/writing/data/LittleWomen.txt
    inflating: ./data_demo/writing/data/two.txt
  extracting: ./data_demo/writing/thesis/empty-draft.md
  extracting: ./data_demo/lxctest2/mb
```

2.9 Change the file permissions flags on `data_demo_new` to `drwxr-x---` using `chmod`.

```
[ese-lixc@login03 ~]$ ll
total 3
drwxr-xr-x  2 root      root      4096 Sep 26 15:20 billing_report
drwxr-xr-x 10 ese-lixc  ese-ouycc 4096 Nov 24 20:36 data_demo
drwxr-xr-x  2 ese-lixc  ese-ouycc 4096 Nov 29 21:45 data_demo_link
drwxr-xr-x  3 ese-lixc  ese-ouycc 4096 Nov 30 20:57 data_demo_new
drwxr-xr-x  2 ese-lixc  ese-ouycc 4096 Nov  5 21:04 exam
drwxr----- 2 ese-lixc  ese-ouycc 4096 Nov 24 20:01 tttt
[ese-lixc@login03 ~]$ chmod 750 data_demo_new/
[ese-lixc@login03 ~]$ ll
total 3
drwxr-xr-x  2 root      root      4096 Sep 26 15:20 billing_report
drwxr-xr-x 10 ese-lixc  ese-ouycc 4096 Nov 24 20:36 data_demo
drwxr-xr-x  2 ese-lixc  ese-ouycc 4096 Nov 29 21:45 data_demo_link
drwxr-x---  3 ese-lixc  ese-ouycc 4096 Nov 30 20:57 data_demo_new
drwxr-xr-x  2 ese-lixc  ese-ouycc 4096 Nov  5 21:04 exam
drwxr----- 2 ese-lixc  ese-ouycc 4096 Nov 24 20:01 tttt
[ese-lixc@login03 ~]$
```

2.10 Print the last 10 commands you made using `history`.

```
[ese-lixc@login03 ~]$ history 10
444 cd data_demo_new/
445 ll
446 cd ..
447 ll
448 chmod 750 data_demo_new/
449 ll
450 history -l 10
451 man history
452 linux 10
453 history 10
```