Data Cubes

```
library(stars)
```

```
## Loading required package: abind
```

```
## Loading required package: sf
```

```
## Linking to GEOS 3.11.0, GDAL 3.5.3, PROJ 9.1.0; sf_use_s2() is TRUE
```

```
library(sf)
library(dplyr)
```

```
##
## Attaching package: 'dplyr'
```

```
## The following objects are masked from 'package:stats':
##
##     filter, lag
```

```
## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

```
library(ggplot2)
```

```
fapar_ds <- read_stars("./data/fapar.nc")
fapar_ds
```

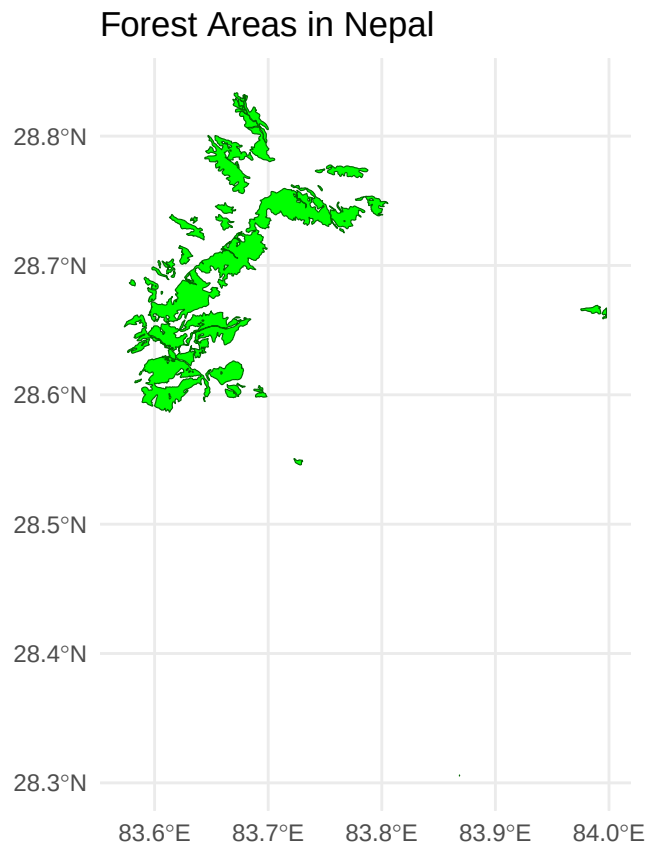
```
## stars object with 3 dimensions and 1 attribute
## attribute(s), summary of first 1e+05 cells:
##           Min. 1st Qu. Median      Mean 3rd Qu. Max.
## fapar.nc     0    0.11   0.18 0.6924535     0.4 2.55
## dimension(s):
##      from   to         offset     delta  refsys x/y
## x       1 1854          80.08  0.004366  WGS 84 [x]
## y       1  923          30.42 -0.004366  WGS 84 [y]
## time    1    5 2023-07-28 UTC    8 days POSIXct
```

```
# Read the shapefile
nepal <- st_read("data/nepal/landuse.shp")
```

```
## Reading layer ‘Landuse’ from data source
##   ‘/Users/mohammadalasawedah/dev/sdsl_cubes/data/nepal/Landuse.shp’
##   using driver ‘ESRI Shapefile’
## Simple feature collection with 4035 features and 7 fields
## Geometry type: MULTIPOLYGON
## Dimension:     XY
## Bounding box:  xmin: 83.47956 ymin: 28.24066 xmax: 84.46899 ymax: 29.33133
## Geodetic CRS:  WGS 84
```

```
# Filter the forest
forest <- nepal %>%
  filter(Category == "Forest")
forest = forest[1:50, ]
```

```
# Plot the data
ggplot() +
  geom_sf(data = forest, fill = "green", color = "darkgreen") +
  labs(title = "Forest Areas in Nepal") +
  theme_minimal()
```




```
a = aggregate(fapar_ds, by = forest, FUN = min)
```

```
a
```

```
## stars object with 2 dimensions and 1 attribute
```

```
## attribute(s):
##           Min. 1st Qu. Median      Mean 3rd Qu. Max. NA's
## fapar.nc  0.01    0.06   0.19 0.2870857    0.46    1   75
## dimension(s):
##          from to         offset  delta  refsys point
## geometry    1 50             NA     NA  WGS 84 FALSE
## time        1  5 2023-07-28 UTC 8 days POSIXct    NA
##                                                                values
## geometry MULTIPOLYGON (((83.86829 ...,...,MULTIPOLYGON (((83.6951 2...
## time                                                             NULL
```

```
plot(a, max.plot = 23, border = 'grey', lwd = .5)
```