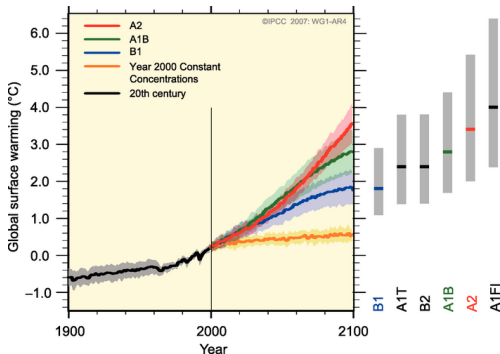


NARCCAP Priorities

Focus on uncertainty across models (rather than across scenarios)

NARCCAP Priorities























Focus on uncertainty across models (rather than across scenarios)



All NARCCAP data are from the A2 emissions scenario

NARCCAP Priorities

Focus on uncertainty across models (rather than across scenarios)

Regional Models	Climate Models				
	GFDL	CGCM3	HADCM3	CCSM	NCEP
CRCM	—		—		
ECP2		—		—	
HRM3		—		—	
MM5I	—	—			
RCM3			—	—	
WRFG	—		—		
Time Slices		—	—		—
ECPC	—	—	—	—	
WRFP	—	—	—	—	

Lab Exercise

1. Download monthly mean GCM (GFDL) data from the IRI Data Library
2. Explore the NARCCAP site to see how their data is organized, then download subsetting data from the course website
3. Use Panoply to explore netCDF files
4. Use Climate Data Operators (CDO) from within R to process the monthly and daily data to annual and seasonal metrics
5. Read data into R and make a few plots

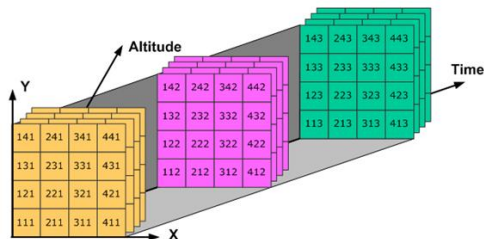
What is netCDF (network Common Data Form)?

... software libraries and machine-independent data formats that support the creation, access, and sharing of **array-oriented scientific data**.

- Developed at Unidata UCAR
www.unidata.ucar.edu/software/netcdf/

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What is netCDF (network Common Data Form)?

- **Self-Describing.** A netCDF file includes information about the data it contains.
- **Portable.** A netCDF file can be accessed by computers with different ways of storing integers, characters, and floating-point numbers.
- **Scalable.** A small subset of a large dataset may be accessed efficiently.
- **Appendable.** Data may be appended to a properly structured netCDF file without copying the dataset or redefining its structure.
- **Sharable.** One writer and multiple readers may simultaneously access the same netCDF file.
- **Archivable.** Access to all earlier forms of netCDF data will be supported by current and future versions of the software.

What's in a netCDF?

- Dimensions latitude, longitude, time (height/depth)
- Variables name, type, shape, attributes and values
- Attributes (“metadata”) information about names, dimensions, units, and type (numeric, character, etc)


```
netcdf file:/media/Data2/Data/narccap/pr_RCM3_gfdl_1968010103.nc
```

```
dimensions:
```

```
time = UNLIMITED;    // (8760 currently)
```

```
bnds = 2;
```

```
yc = 104;
```

```
xc = 134;
```

```
variables:
```

```
double time_bnds(time=8760, bnds=2);
```

```
float pr(time=8760, yc=104, xc=134);
```

```
:grid_mapping = "Transverse_Mercator";
```

```
:standard_name = "precipitation_flux";
```

```
:long_name = "Precipitation";
```

```
:units = "kg m-2 s-1";
```

```
:coordinates = "lon lat";
```

```
:missing_value = 1.0E20f; // float
```

```
:_FillValue = 1.0E20f; // float
```

```
double time(time=8760);
```

```
:long_name = "time";
```

```
:standard_name = "time";
```

```
:axis = "T";
```

```
:calendar = "noleap";
```

```
:units = "days since 1968-01-01 00:00:0.0";
```

```
double lat(yc=104, xc=134);
```

```
:units = "degrees_north";
```

```
:long_name = "latitude";
```

```
:standard_name = "latitude";
```

```
:axis = "Y";
```

```
:title = "UC Santa Cruz RegCM3 model output prepared for NARCCAP  
present-day climate using NCEP/DOE Reanalysis";
```

```
:experiment_id = "present-day climate using NCEP/DOE Reanalysis";
```

```
:table_id = "Table 2";
```

```
:project_id = "NARCCAP";
```

```
:source = "RegCM3 (2006) atmosphere: RegCM3v3.1 hydrostatic, split-explicit,  
horizontal equal area grid resolution of 50 km by 50 km
```

```
:institution = "CCIL, UC Santa Cruz (Climate Change and Impacts Laboratory,  
University of California, Santa Cruz, CA, USA)";
```