Zarr: optimized cloud storage

Why Bother with a new format?

```
dmdu -sh my_OM4p125_run/*

6.8T    history
9.4T    pp
1.8T    restart
2.7T    zstore
```

- zarr have BLOSC compression
- designed for cloud object storage
- chunk size matters (10-100 Mo)
- stores can be of different types (zip/directory/…)

```
temp_tendency
├── temp_tendency/0.0.0.0
├── temp_tendency/0.1.0.0
├── temp_tendency/0.2.0.0
├── temp_tendency/0.3.0.0
├── temp_tendency/0.4.0.0
├── temp_tendency/0.5.0.0
├── temp_tendency/0.6.0.0
├── temp_tendency/0.7.0.0
├── temp_tendency/0.8.0.0
├── temp_tendency/0.9.0.0
├── temp_tendency/1.0.0.0
├── temp_tendency/10.0.0.0
```

```
├── ./tosga
│   └── ./tosga/gn
│       └── ./tosga/gn/v1
│           ├── ./tosga/gn/v1/tosga.yml
│           └── ./tosga/gn/v1/tosga.zip
├── ./umo
│   └── ./umo/gn_d2
│       └── ./umo/gn_d2/v1
│           ├── ./umo/gn_d2/v1/umo.yml
│           └── ./umo/gn_d2/v1/umo.zip
├── ./uo
│   └── ./uo/gn_d2
│       └── ./uo/gn_d2/v1
│           ├── ./uo/gn_d2/v1/uo.yml
│           └── ./uo/gn_d2/v1/uo.zip
```

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zarr ZipStore vs DirectoryStore

1. in DirectoryStore, 1 chunk = 1 file. For 3d monthly
variable (60 yr run), this amounts to a lot. ZipStore = 1 file!!!

```
directory_store/./thetao/.zmetadata
(base) PPAN: Raphael.Dussin@an104  perf_tests: find directory_store/. -type f | wc -l
25697
(base) PPAN: Raphael.Dussin@an104  perf_tests: find zipstore/. -type f | wc -l
1
```

2. Similar performance using dask cluster:

```
[4]: rootdir = '/work/Raphael.Dussin/zarr_stores/perf_tests/'

     zds = xr.open_zarr(f'{rootdir}/zipstore/thetao.zip', consolidated=True)
     dds = xr.open_zarr(f'{rootdir}/directory_store/thetao', consolidated=True)
```

```
[44]: zm = zds['thetao'].mean(dim='time')
```
```
[45]: %%time
      zm.load()

      CPU times: user 3min 31s, sys: 10.1 s, total: 3min 41s
      Wall time: 11min 51s
```

```
[46]: dm = dds['thetao'].mean(dim='time')
```
```
[47]: %%time
      dm.load()

      CPU times: user 3min 43s, sys: 11.2 s, total: 3min 54s
      Wall time: 13min 45s
```

3. ZipStore not as commonly used as DirectoryStore hence some bugs
found along the way (and fixed)