Proposal for a sub-seasonal research data set

Sub-seasonal real-time Operational Forecasts

	ECMWF	JMA	NCEP	UKMO	CAWCR	EC (EXP)	KMA	CMA	CPTEC (EXP)
Time Range	d 0-32	d 0-34	d 0-45	d 0-60	d 0-120	d 0-35	d 0-30	d 0-45	d 0-30
Resol.	T639/ 319L62	T159L60	T126L64	N96L85	T47L17	0.6x0.6 L40	T106L21	T63L16	T126L28
Ens. Size	51	50	16	28	33	21	20	40	1
Freq.	Twice a week	Once a week	Once a day	Once a week	Once a week	Once a week	3 times a month	6 times a month	Once a day
Hcsts	On the fly	On the fly	Fix	On the fly	Fix	On the fly	Fix	?	No
HcSt Freq	Once a week	3 times a month	Once a day	4 times a month	3 times a month	Once a week	3 times a month	?	-
Hcst Length	Past 18 years	1979-2009	1999-2010	1989-2003	1999-2010	Past 15 years	1979-2010	?	-
HCST Ens. size	5	5	4	3	33	4	20	?	-

1. Proposal for a sub-seasonal database

- 5-year experiment
- At first, consider only the weekly forecasts starting on Monday or Thursday or either Monday or Thursday

  Monday: ECMWF, NCEP, UKMO, EC(?), CACWR(?)

  Thursday: ECMWF, JMA, NCEP, UKMO, CAWCR (?), EC(?)
- Archive daily means of real-time forecasts + hindcasts.
- Real-time forecasts 1 week behind real-time?
- Archive the variables in a 1x1 degree grid or lower once a week.
- Use TIGGE protocol (GRIB2) for archiving the data. The data could also be archived in NETCDF for WCRP community.
- Use of the first 2 months of the CHFP (?) seasonal and climate forecasting systems to compare with the archive (above). Need for daily or weekly/pentads archive.

Proposed list of variables: TIGGE pressure level fields

1000, 925, 850,700,500,*300,250,*200 **and 50 hPa**

Geopotential Height
Specific Humidity
Temperature
U
V

Potential vorticity at 320K

Potential temperature, u, V a PV level 2

Proposed list of variables: TIGGE Surface fields

-10 meter U
-10 meter v
- CAPE
-Convective inhibition
-Field capacity
-Land-se mask
-Orography
-Skin temperature
-Snow depth water equivalent
-Snow fall water equivalent
-Soil moisture
-Sunshine duration
-Surface air dew point temperature (?)
-Surface air maximum temperature
-Surface air minimum temperature
-Surface air temperature
-Surface pressure
-Time integrated outgoing long -wave radiation
-Time integrated surface latent heat flux
-Time –integrated surface net solar radiation
-Time integrated surface net thermal radiation
- Time-integrated surface sensible heat flux
-Total cloud cover
-Total Column water
-Total precipitation
-Wilting point
- 2-meter temperature
- Surface wind stress (East-West and North-South)
- Mean sea-level pressure
- Sea surface temperature

Potential archiving centers

- ECMWF and IRI could be interested – NCAR (?)

- For archiving at ECMWF, we shouldn't exceed 10% of TIGGE, about 18 TB per year

Archiving cost

- Hypothesis: 1x1 degree or less – 80 variables

  (134 kb /day/variable/ensemble member)

	RT	HC	TOT
ECMWF	0.9	1.6	**2.5**
JMA	0.96	2.1	**3.1**
NCEP	1.75	0.8	**2.5**
UKMO	0.9	1.4	**2.3**
EC	0.4	1.1	**1.5**
CAWCR	0.1	0.8	**0.9**

Total cost of about 13 TB/year

Current cost of TIGGE: 178 TBytes /year

ISSUES

- Calibration period ?
- Need to also archive calibrated fields?
- Hindcast archiving? Needs to be defined by WMO for GRIB2.

  At ECMWF, we use 2 dates in the GRIB definition:

  - DATE (date of the real-time forecast)
  - HDATE (hindcast date).
- This plan should be OK for the WWRP community but would the WCRP community use it? Issue with GRIB2. Possible solution would be to have a mirror archiving of all or some fields in netcdf (CHFP? Or IRI?).
- What to do with seasonal forecasts? Ideally the first 2 months of the CHFP seasonal forecasts could be compared. Need for daily archive.

Need for calibrated products?

The daily archive could satisfy the "motivated experienced" user but computing anomalies may be too cumbersome and too costly for many users.

A possible solution would be to archive calibrated anomalies averaged over a weekly period or pentads. This could be done for just a few key variables as a demonstration. This could be done in collaboration with the CBS initiative.

Possible issues:

- More work for data providers although this will be done for CBS.
- Common calibration period?
- GRIB2 definition should be agreed