

# TAC To BUFR Migration

This space is made available for a collaborative discussion on the status and challenges of the migration from Traditional Alphanumeric Codes (TAC) to BUFR. The aim is to share the information on the status of the BUFR data as seen by the users and to provide feedback to WMO and the producers to improve the usability of the data.

The latest version of the migration matrix as taken from the [WMO page on migration to TDCF](#) shows that the discontinuation of the category 1 data was planned by November 2014. Many of the reports are now available in BUFR and some TAC bulletins have ceased. A detailed report on the status of the migration in March 2015 is available on the [ECMWF](#) page.

A paper on [Progress towards high-resolution, real-time radiosonde reports](#) is now available (Bull. Amer. Meteor. Soc., 2016).

An additional complication is that "WIGOS Station Identifiers" have been introduced by WMO and necessitate widespread software changes.

[Links for migration to BUFR and WIGOS Station Identifiers](#)

## Status in January 2018

The UK, Eire and Netherlands SYNOPs were switched off in early November 2014 as advertised. ASDE and ASEU TEMP SHIP reports ceased on 21 November (as did research ship DBLK), originally expected 10 November. UK and Eire alphanumeric SHIP reports ceased on 3 March 2015 (the UK will still provide them bilaterally on request). In May 2015 SYNOP data from New Zealand and Hungary ceased as did SHIP data from New Zealand. In 2016 and 2017 SYNOP reports from Spain, Germany and various other European countries ceased. In late 2017 Finland stopped reporting alphanumeric TEMPs followed by Norway in January 2018. For more details of such events see [TAC GTS switch off](#).

About 31% of radiosonde stations are now provide high-resolution BUFR (boosted by 60+ US stations in late 2017) another 8% provide native low-resolution BUFR, but about 25% of radiosonde stations aren't producing any BUFR at all (see <https://confluence.ecmwf.int/display/TCBUF/Data+availability> about 83% of SYNOP stations now provide BUFR). Many BUFR radiosonde reports are reformatted TEMP/PILOT - although the proportion of native (and high resolution) BUFR is gradually increasing (see <https://confluence.ecmwf.int/display/TCBUF/Structure> for notes about problems with reformatted TEMP data). There is a risk of countries switching off TAC observations when the BUFR doesn't meet the coding regulations (or has other quality problems). ECMWF started assimilating some subsets of BUFR radiosonde and surface data on 11 November 2014 but one or two other NWP centres can't use BUFR radiosonde data from the GTS yet. A few BUFR reports still have rather basic errors, such as wrong positions, and there are plenty of other more subtle errors/features in the data. In one case both 00 and 12 UTC BUFR radiosonde reports were available within the country concerned, but only the 00 UTC reports were on the GTS. ECMWF is taking the pragmatic approach of processing both TAC and BUFR data and gradually switching on more of the BUFR reports after they have been assessed. Comparing different versions of the same reports is a very good way of finding problems, but it takes time and we can't look at lots of countries all at once.

In general we would like to see an overlap of several months between the TAC and BUFR reports - and it should be the final version of BUFR (**not** radiosonde data still in parts; and for SHIPs the new template not the one that is being phased out). There is a need for more coordination/information of TAC switch off dates via WMO (as described above a blanket switch off in November 2014 was unrealistic), two months warning via METNO of TAC cessation from a particular country would allow us to check and activate the BUFR data. Developing countries in particular may need more time/help to produce acceptable BUFR reports (especially for radiosondes).

## Oceanographic data

ECMWF started processing BUFR BUOY pressure data in June 2016 and assimilating them in July 2016. There is concern that some oceanographers may still be unaware that they have to make changes due to the move to BUFR. Some of the tropical moored buoys that make subsurface measurements (including 14040 and 14043 - these are 1400040 and 1400043 in BUFR) are only available in BUFR. When CLS /MeteoFrance switch off their FM18 reports on 1 November 2016 there will be many more TAO/TRITON/PIRATA/RAMA buoys that are only available in BUFR. I understand that some TESAC and ARGO reports are currently available on the GTS in BUFR (no BATHY as yet?). See [Marine and ocean observations](#) for details of marine data and their transition to BUFR.

## High resolution data

*New data have been released and NWP Centres have put a considerable effort in acquiring and processing new BUFR data which are expected to improve the forecast scores. The extra detail in the observations provided by the transition from TAC to BUFR can be visually represented by the temperature profile in the following figure where BUFR data are reported alongside the corresponding TAC values. For more information regarding the use of these data at ECMWF and their quality see [ECMWF section of this wiki](#).*

MIGRATION MATRIX													
Category of traditional Alphanumeric Codes (TAC)	Nov. 2005	Nov. 2006	Nov. 2007	Nov. 2008	Nov. 2009	Nov. 2010	Nov. 2011	Nov. 2012	Nov. 2013	Nov. 2014	Nov. 2015	Nov. 2016	
Cat. 1: Common													
SYNOP, SYNOP MOBIL													
PILOT, PILOT MOBIL													
TEMP, TEMP MOBIL													
TEMP DROP, CLIMAT													
Cat. 2: Satellite observations													
SARAD, SAREP													
SATEM, SATOB													
Cat. 3: Aviation													
METAR, SPECI, TAF													
AMDAR													
Cat. 4: Maritime													
BUOY, TRACKOB													
BATHY, TESAC													
WAVEOB, SHIP													
CLIMAT SHIP													
PILOT SHIP													
TEMP SHIP													
Argos data													
Cat. 5: Miscellaneous													
RADOB, IAC													
IAC FLEET													
GRID, RADOF													
Cat. 6: Obsolete													
ICEAN, GRAF, NACLI etc., SFAZI, SFLOC, SFAZU, ROCOB, ROCOB SHIP, CODAR, WINTEN, ARFOR, RADREP, MAFOR, HYDRA, HYFOR, CLIMAT TEMP													
CLIMAT TEMP SHIP NOT APPLICABLE													

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