

# Future developments for MARS

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# Migration to ecCodes

# What is ecCodes?

- ecCodes is the planned replacement of grib\_api
- very very similar to grib\_api:
  - ecCodes in facts simply super-seeds grib\_api
  - Applies the same key-value design and separation of definitions from the encoding/decoding engine to other meteorological format: BUFR, etc.
- The local definitions of grib\_api needed by MARS can almost be integrally transferred to ecCodes
  - but few syntax differences
  - maybe more differences (mainly in the directory structure and the naming convention) if we re-factor some parts of the definitions to become more flexible and more center agnostic

## Why move to ecCodes then?

- In principle, it is not mandatory
- But grib\_api will not be maintained anymore
  - No bug fixes
  - No updates of the definitions from WMO
  - No new features...
  - Etc.

# Some work can be done to improve the definitions!

- Better separation between WMO and local definitions:
  - In GRIB-1, WMO and local definitions are inter-mingled [improvement]
  - In GRIB-2, it is impossible to use local table versions (and even only local tables) [bug]
- Solve the precedence madness:
  - Current lookup for centre XX in GRIB-1: [improvement]
    - ECMWF local tables
    - WMO master tables
    - Centre XX local tables!
  - Current lookup for centre XX in GRIB2: [improvement]
    - ECMWF/WMO inter-mingled master tables
    - And that's it, local is broken!

## Definitions (cont.)

- Generic decoding/encoding assumes many ECMWF conventions not necessarily wanted by others:
  - Height above ground levels are projected into the surface: encoded as level=0 meters [bug]
  - Steps are converted to hours by default unless forced to the native units explicitly. [improvement]
- Very few hooks for local customization provided:
  - Impossible to customize aliasing or namespacing. [improvement]
- Very flat organization of the definitions files making it very messy and hard to maintain [improvement]
  - For instance, the local.[centre].[localDefinitionNumber].def at the top level of the definitions
  - Should be moved to something like grib[1-2]/local/[centre]/[localDefinitionNumber].def
- Default encoding in GRIB-2 is to use master tables version 5 (from November 2009!!!)
  - Latest tables, version 16, from November 2016

## Definitions (cont.)

- No separations between GRIB encoding/decoding and MARS:
  - All the MARS logic should be moved to the “mars” directory
  - Currently many many mars stuff done at decoding for every single GRIB record, whatever you do!
- Within the “mars” directory, no center specific place to put your stuff
  - We should introduce a mechanism for local mars definitions.
- Complete review and cleanup of the parameter database is needed
  - Wrong entries
  - Inconsistency in units
  - Duplicates
  - etc.

More on this tomorrow