

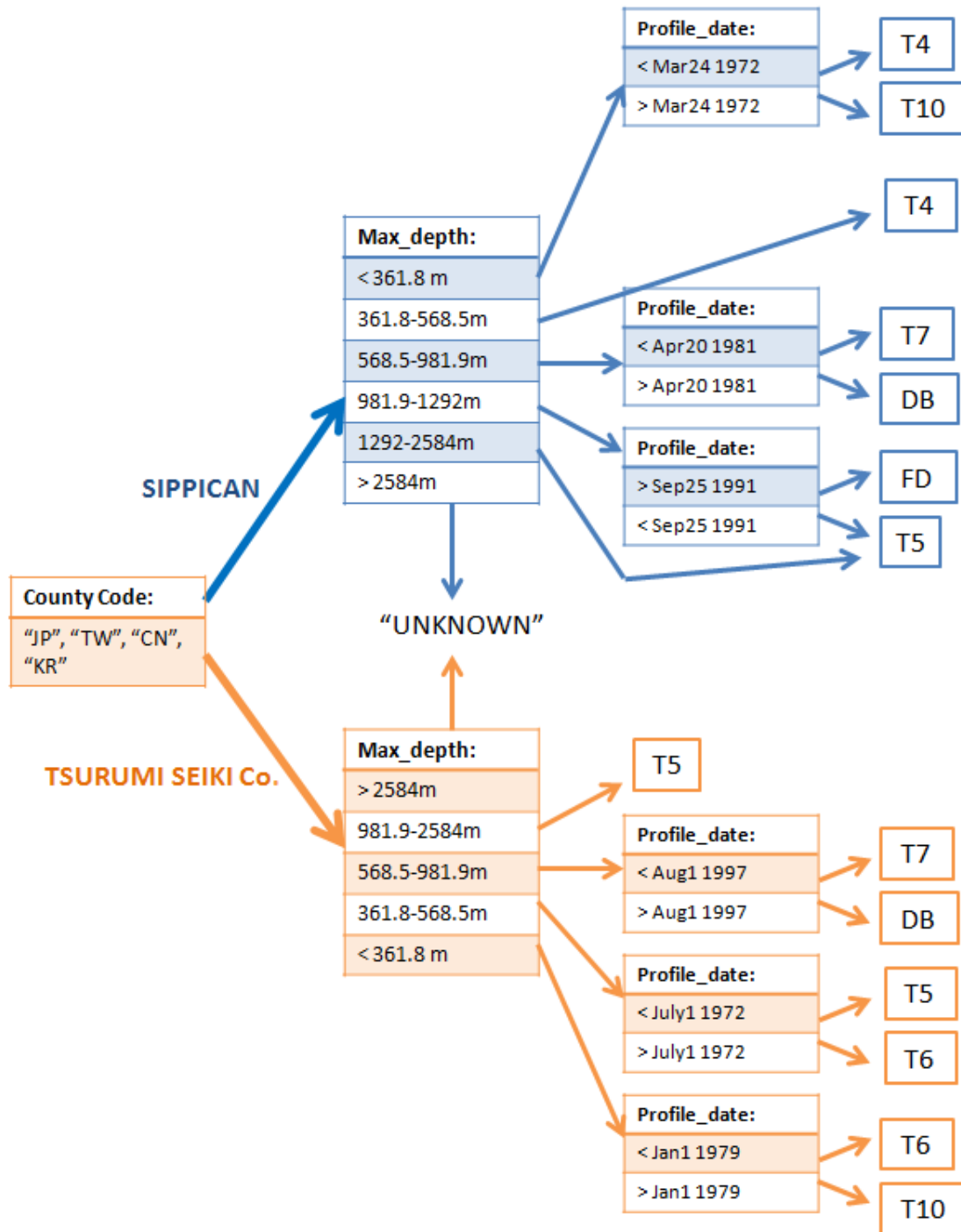
Progress with intelligent meta data

Matt Palmer, Bec Cowley, Tim Boyer, Shoichi Kizu, Toru Suzuki

- Evolution of the approach taken in Cowley et al (2013, *J. Clim.*)
- Started off trying to replicate code, but became apparent that flow diagrams are helpful (and independent of programming language!)
- Briefly summarise where we are, and where I think we could (should?) go..

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“v1” Intelligent Meta Data Algorithm



Following Cowley et al (2013), probes are allocated a unique type based on:

1. Country code
2. Profile date
3. Max depth

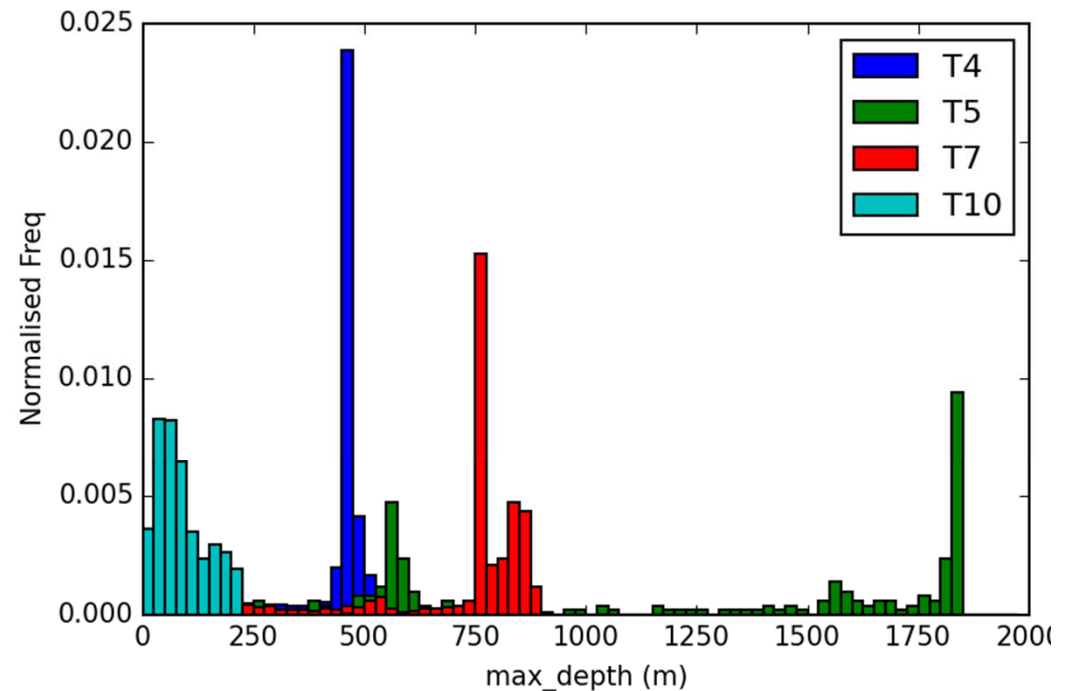
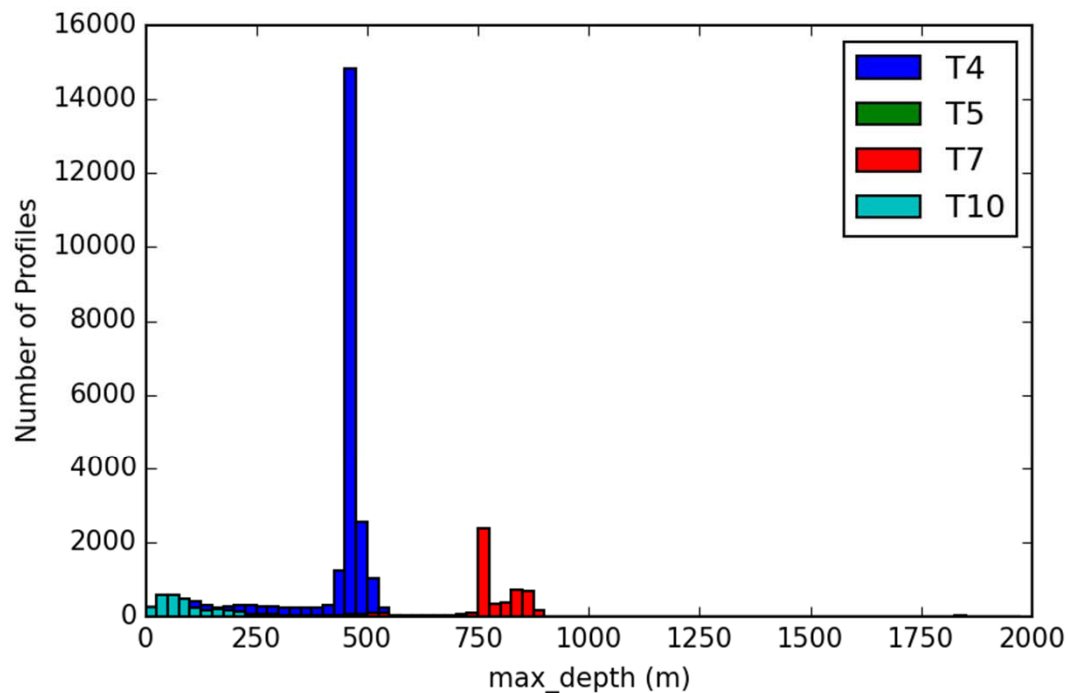
Flow charts are a useful way of documenting the algorithm – independent of code and less chance for errors (?)

Various refinements to this algorithm under discussion

I would like to see the “cut off” depths informed directly from the data..

Next Steps..

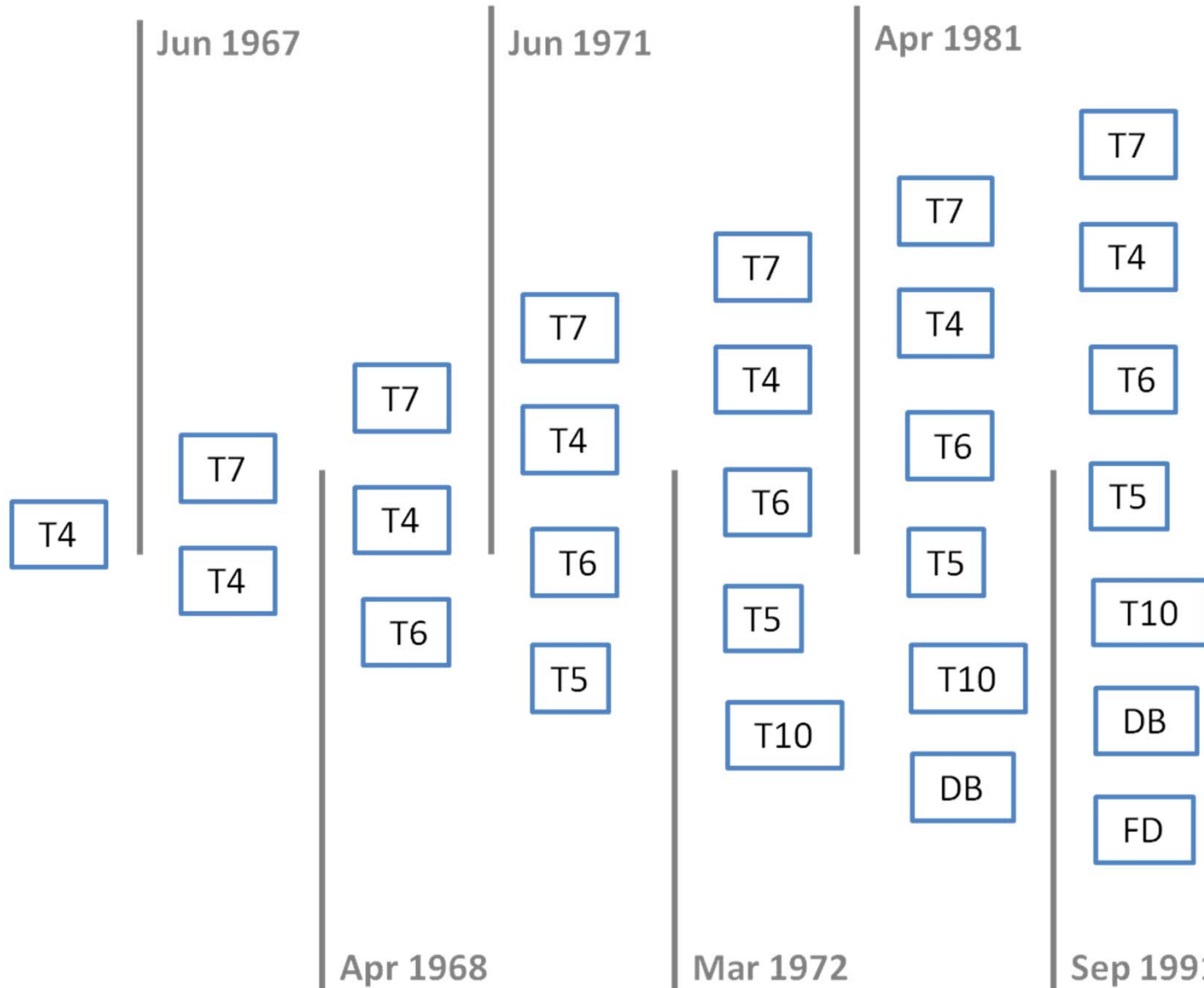
- Finalise algorithm and apply to the database (including data-led specification of “cut off” depths?)
- Write up short paper to document algorithm and assess the “skill” of the algorithm on known XBT types



Frequency distribution for Sippican XBT probes from 1978. Source: World Ocean Database

Further ahead – probabilistic iMetaData (?)

Availability of Sippican XBTs



Based on Cowley et al [2013]
“earliest date to market”

Further ahead – probabilistic iMetaData (?)

- In reality assigning iMetaData is a question of assigning a “likely” probe type (current scheme sets likelihood = 1.0 or 100%)
- My view is that ultimately we should be working towards a probabilistic framework – unknown probes could be of any type (so long as they exist at the time of the observation)
- This would allow us to take a Monte Carlo approach to generating numerous realisations of iMetaData, and improved XBT bias correction uncertainties (?)
- I am discussing possible Machine Learning approaches with colleagues at the Met Office