

# UM Change Control Process

So you want to alter the UM and get your change into a future release.



# UM Release

Current release is vn10.4 (vn10.5 is due end of June 2016)

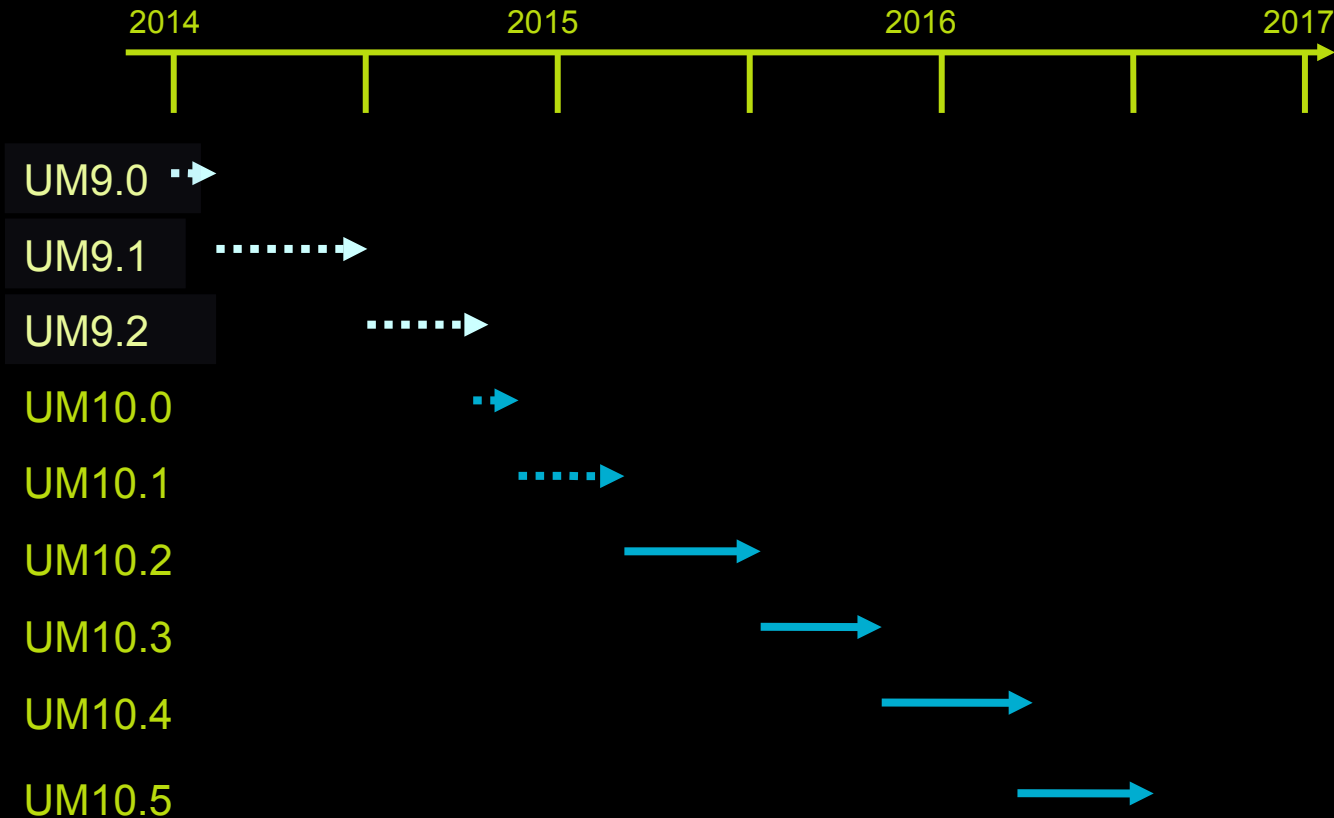
Met Office test codes on local HPC/desktops systems.

We encourage UM partners to set up routine local test suites to test the code trunk on their own platforms.

We gratefully appreciate contributions to the UM testing and expect feedback from our partners to help fix porting issues on other platforms.



# Release schedule



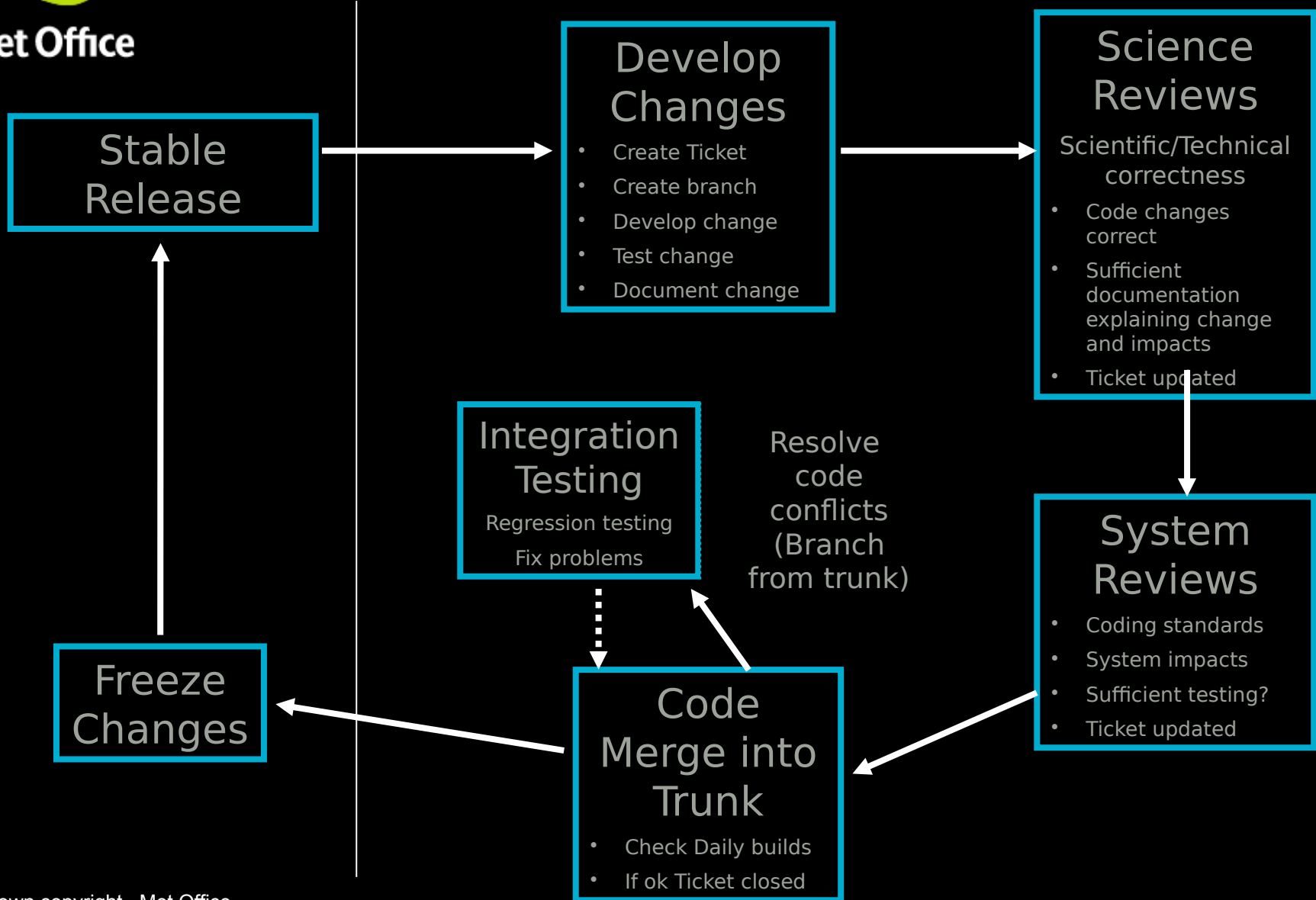
~3-4 release per annum

Project Board oversees the release schedule plans.



Met Office

# UM Release Build Cycle





# UM source

Met Office (GB) | https://code.metoffice.gov.uk/trac/um/log/main/trunk/src/control/grids/p\_to\_u.F90

Google

um | Unified Model

logged in as glenngreed | [Logout](#) | [Preferences](#) | [Help/Guide](#) | [About Trac](#)

[Wiki](#) | [Timeline](#) | [Roadmap](#) | **[Browse Source](#)** | [View Tickets](#) | [New Ticket](#) | [Search](#) | [Admin](#)

[View Latest Revision](#)

source: **main / trunk / src / control / grids / p\_to\_u.F90**

Added

Modified

Copied or renamed

[View changes](#)

Diff	Rev	Age	Author	Log Message
<input type="radio"/>	<a href="#">@052</a>	3 months	glenngreed	<a href="#">#134</a> : Ricky Wong : Removal of domain_params and create model_domain ...
<input type="radio"/>	<a href="#">@193</a>	6 months	glenngreed	<a href="#">#24</a> : Steve Wardle and Ricky Wong : Code Styling of the UM : task : ...
<input checked="" type="radio"/>	<a href="#">@1</a>	6 months	fcmm	Initial import

Revision Log Mode:

☒ Stop on copy  
☐ Follow copies  
☐ Show only adds and deletes

View log starting at  and back to

Show at most  revisions per page.

☐ Show full log messages

[Update](#)

Note: See [TracRevisionLog](#) for help on using the revision log.

Download in other formats:  
[RSS Feed](#) | [ChangeLog](#)

See the [FAQ](#) for more information about using this system

Wiki: WikiStart

Welcome to the

Welcome to the UM  
This service is for t  
Please consider the

[Getting Started u](#)

Release Schedule

Release	Version
--	UM10.0
Current	UM10.1
	vn10.2 C
	vn10.2 C
Next	vn10.2 n

Tickets Submitte

Future release time

UM Support

For general UM issu  
**Who should I con**  
to identify who you  
If you are still unsu

UM system

CRUM team

The UM library

Essential reading

The UM developme  
Release Notes  
Advice when building from bra

31 USE yomhook, ONLY: lhook, dr\_hook

32 USE parkindl, ONLY: jprb, jpim

33

34 USE model\_domain\_mod, ONLY: model\_type, mt\_single\_column

35

36 IMPLICIT NONE

37

38

© Crown copyright Met Office



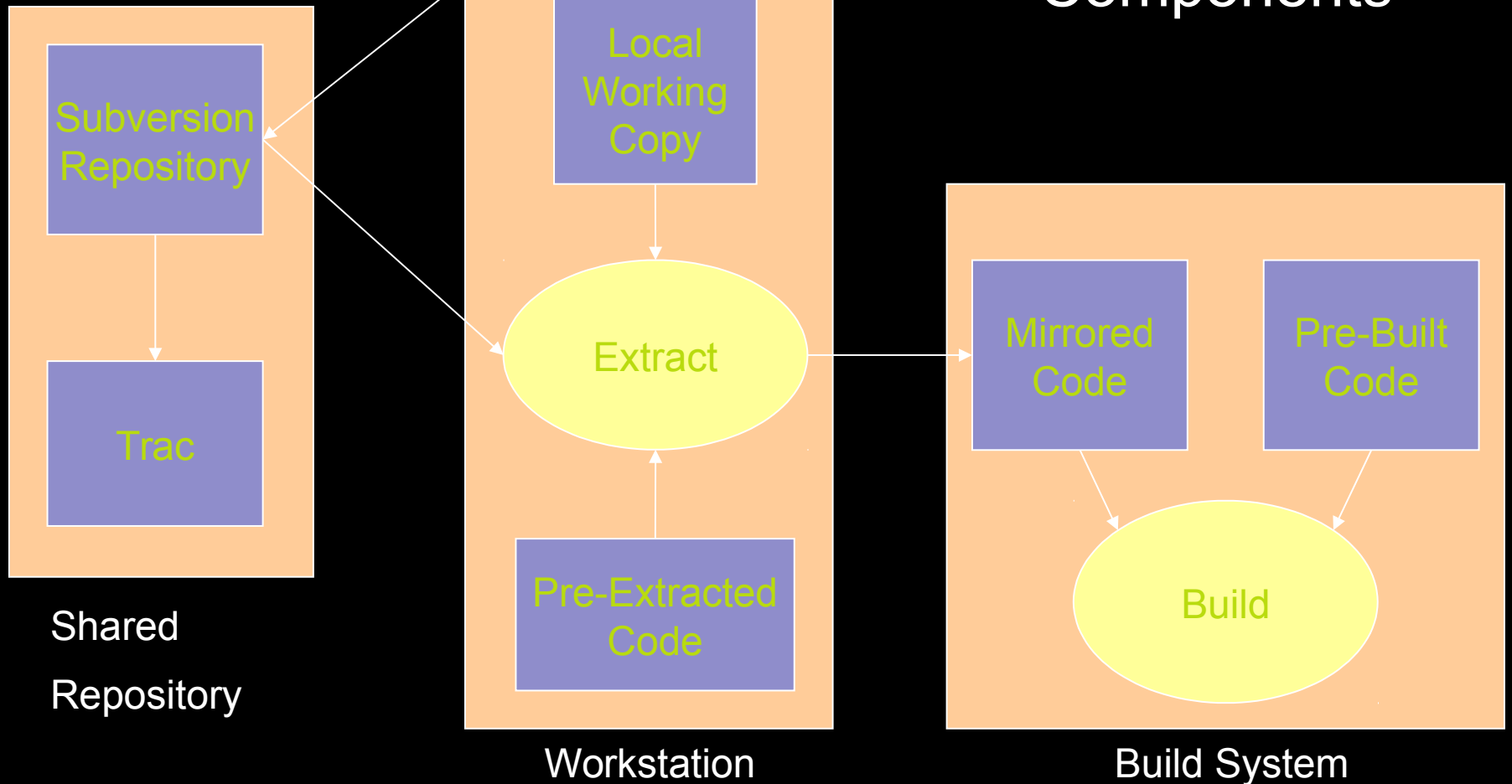
## Making Code changes: FCM (Subversion)

- The FCM System has 3 components:
- Integrated Configuration Management, wiki and issue tracking system (Trac)
- make (Extract and Build)



## Making Code changes: FCM (Subversion) and the UM

- Full history of UM source (repository)
  - accessible on the web via Trac
- Edit UM source code directly on the desktop
- Version control of UM directory tree
  - Directory tree
  - Copy, rename, add, delete files and directories
- Atomic commits
  - All or nothing is committed to the repository
  - Sequential changesets





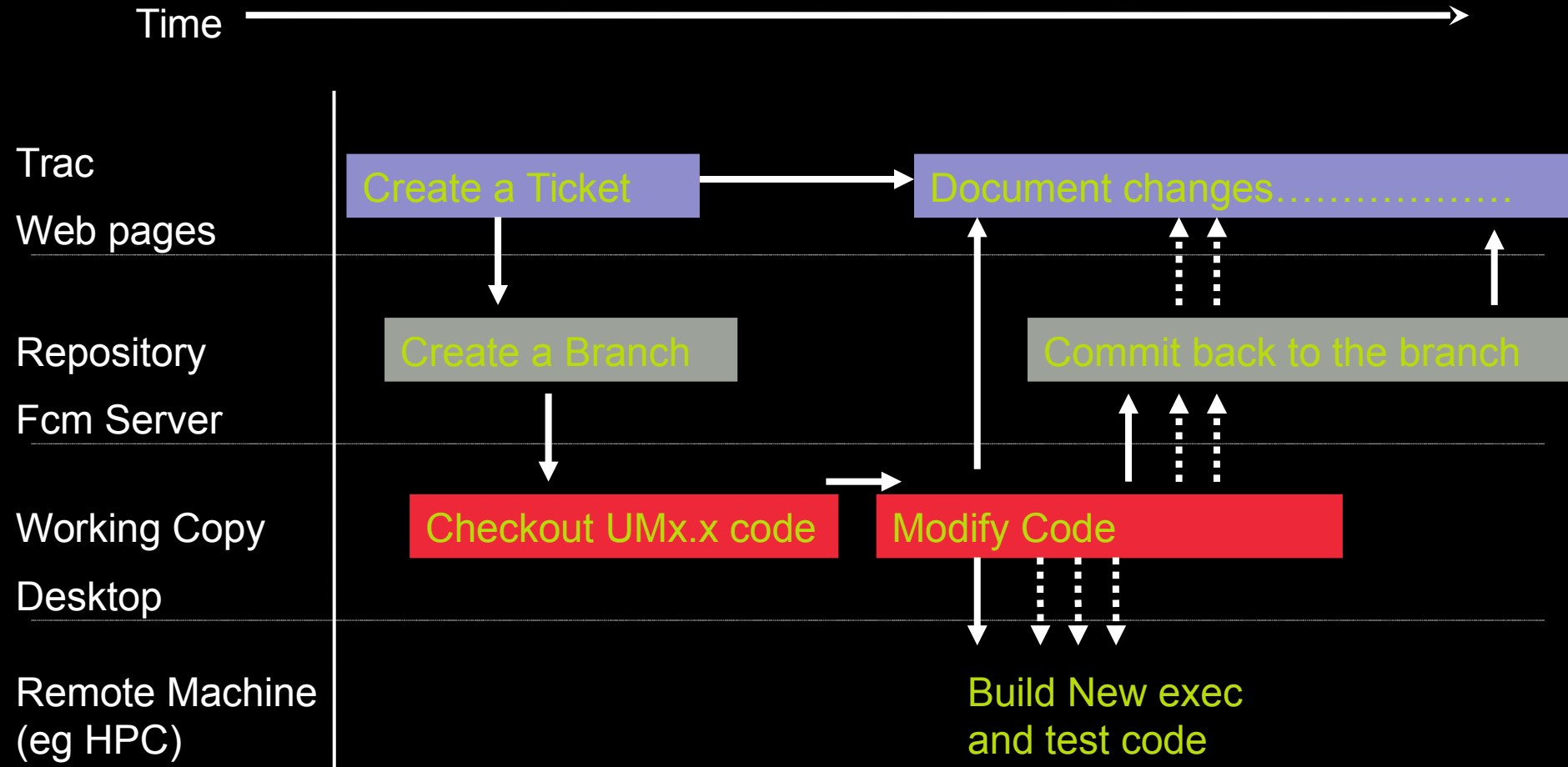


## Making Code changes: TRAC

- Integrated wiki and issue tracker
- Browser for subversion repository, including project tree, revision logs and change-sets
- Roadmap for managing project releases
- Timeline view of issues, wiki pages and subversion repository



# Making Code changes: Typical Workflow (as used at the Met Office)





# Making Code changes: Create a ticket



Met Office (GB) | https://code.metoffice.gov.uk/trac/um/ticket/565

Unified Model

logged in as glenngreed | [Logout](#) | [Preferences](#) | [Help/Guide](#) | [About Trac](#)

Wiki | Timeline | Roadmap | Browse Source | **View Tickets** | New Ticket | Search | Admin

← Previous Ticket | [Back to Query](#) | Next Ticket →

**#565** [in\\_progress](#) enhancement Opened 6 days ago  
Last modified 4 days ago

**max wind diagnostics for the UM**

Reported by:	glenngreed	Owned by:	glenngreed
Milestone:	UM10.2 code release	Component:	General
Severity:	minor	Keywords:	
Cc:			

Description (last modified by glenngreed) Δ

Part of the fieldcalc replacement project is to port many of its current diagnostics within the UM. [Reply](#)

In this ticket we deal with the max wind related diags...

20020 - 20023 and 20041-20042

[Attachments](#) (0)

[Change History](#) (2)

☒ Oldest first ☐ Newest first  
☐ Comments only

Changed 6 days ago by glenngreed comment1

- **Status** changed from *new* to *in\_progress*  
[main/branches/dev/glenngreed/r5213\\_maxwind\\_diags](#) [Reply](#) [Edit](#)

Changed 4 days ago by glenngreed comment2

- **Description** modified ([diff](#)) [Reply](#) [Edit](#)



Powered by **Trac 1.0.2**  
By Edgewall Software.

Note: See [TracTickets](#) for help on using tickets.

See the [FAQ](#) for more information about using this system

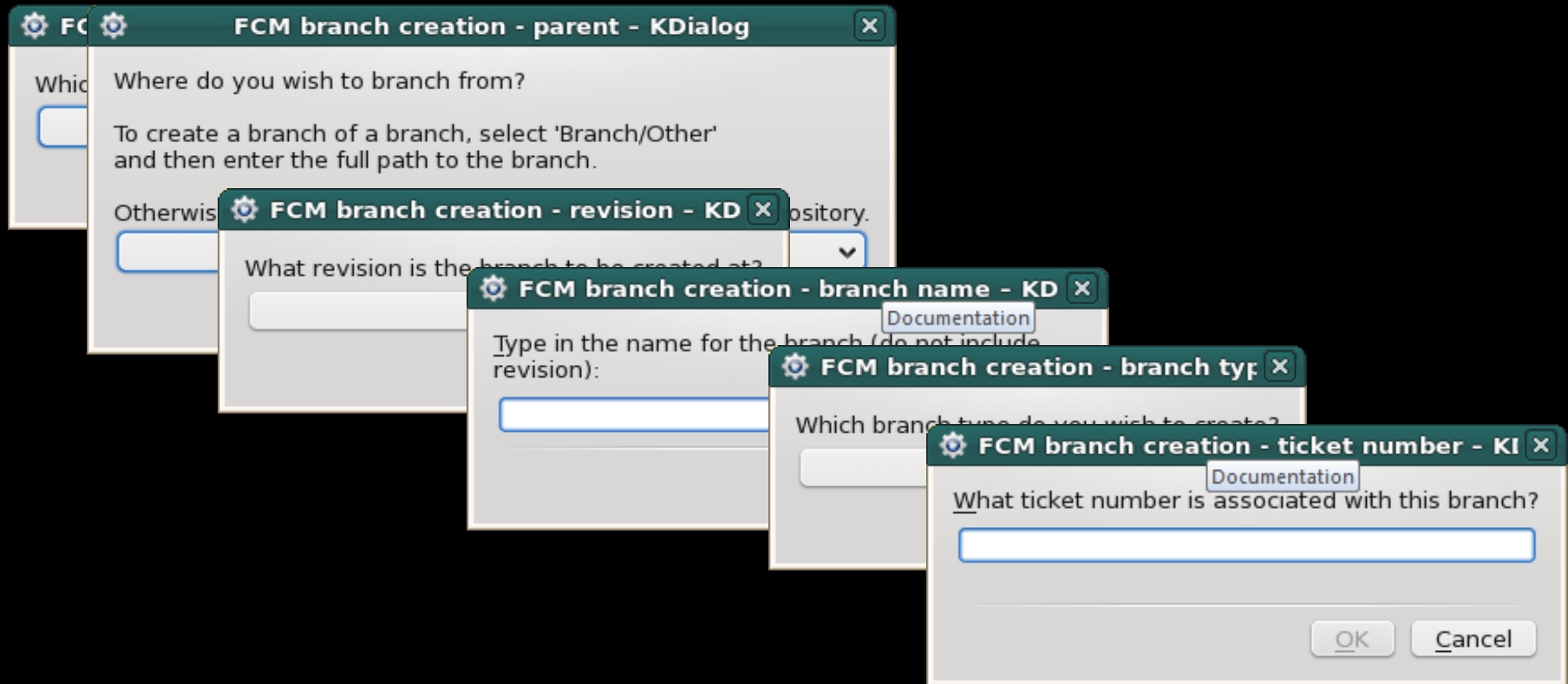


# Documentation

- In line with code
  - [UM code in repository](#)
- Documentation papers
  - [UMDP source code in repository](#)
- Tickets
  - [TRAC pages](#)
    - [Links to UM code branch](#)
    - [Links to UMDP source branch](#)
    - [Ticket Summary](#)
    - [Standardised Testing reports](#)



# Making Code changes: Create a branch



svn URL of branch may be replaced by keywords

fc:um.x\_br == <https://code.metoffice.gov.uk/svn/um/main/branches/>



# Making Code changes:

```
fcms co fcm:um_br/<branchname_path>
```

Will checkout a complete UM tree from the repository,  
UM version as specified when creating the branch.

This tree is now on the desktop and can be modified as required using your fav editor.

## Useful fcm commands when modifying code

<code>fcm info</code>	(lists details of the working copy's repos branch.)
<code>fcm status</code>	(lists routines modified in working copy, not committed back to the repos branch)
<code>fcm diff (-g)</code>	(provides details of the changes actually made.)
<code>fcm commit</code>	(commits code back to the branch in the repository.)
<code>fcm switch</code>	(switch a working copy to work with another branch)

Others you will use in time `fcm: merge, cf, swap, add, delete`

```
# Start: 2006-09-29 12:27:08=> fcm status
=> svn status
A      src/control/top_level/um_shell_sub.F90
M      src/control/top_level/um_shell.F90
D      src/control/top_level/dummy.F90
# Time taken:          1 s=> fcm status
|
```



# Making Code changes:

```
gridsp_to_t.F90 (../svn/fcm2/UM_svn/UM/trunk/src/control) (revision 14793) <-> gridsp_to_t.F90 (working copy)
File Edit View Global Region Line Options Display Windows Help

gridsp_to_t.F90 (../svn/fcm2/UM_svn/UM/trunk/src/control) (revision 14793) 1
! (C) Crown copyright Met Office. All rights reserved.
! For further details please refer to the file COPYRIGHT.txt
! which you should have received as part of this distribution.
! *****COPYRIGHT*****
! SUBROUTINE P_TO_T
!
! SUBROUTINE P_TO_T (
!   ! For temperature.
!   ! IN Field dimensions and pointers.
!   & row_length,rows, halo_i, halo_j
!   & halo_i_data, halo_j_data, LEVELS
!   ! IN Vertical coordinate levels.
!   & R_THETA_LEVELS, R_RHO_LEVELS
!   ! IN field to be interpolated.
!   & FIELD_IN
!   ! OUT Interpolated field.
!   & FIELD_OUT
!   & )
!
! PURPOSE:
!
! HISTORY:
! DATE    VERSION    COMMENT
! 03/02/06  6.2      Move to C92_2A. P.Selwood
!
! CODE DESCRIPTION:
! LANGUAGE: FORTRAN 77 + CRAY EXTENSIONS
! THIS CODE IS WRITTEN TO UMDP 3 PROGRAMMING STANDARDS.

gridsp_to_t.F90 (working copy) 14
! (C) Crown copyright Met Office. All rights reserved.
! For further details please refer to the file COPYRIGHT.txt
! which you should have received as part of this distribution.
! *****COPYRIGHT*****
! SUBROUTINE P_TO_T
!
! SUBROUTINE p_to_t (
!   ! For temperature.
!   ! IN Field dimensions and pointers.
!   row_length,rows, halo_i, halo_j
!   halo_i_data, halo_j_data, levels
!   ! IN Vertical coordinate levels.
!   r_theta_levels, r_rho_levels
!   ! IN field to be interpolated.
!   field_in
!   ! OUT Interpolated field.
!   field_out
!   )
!
! CODE DESCRIPTION:
! LANGUAGE: FORTRAN 77 +
! THIS CODE IS WRITTEN T
```

Viewing the same diff within TRAC browser once code committed back to branch.

UM/branches/dev/frgg/VN7.4_Code_Style/src/control/grids/p_to_t.F90		Tabular	Unified
Revision 288	Revision 15157		
1 #if defined(C92_2A)	1 #if defined(C92_2A)		
2 !	2 !		
3 ! *****COPYRIGHT*****	3 ! *****COPYRIGHT*****		
4 ! (C) Crown copyright Met Office. All rights reserved.	4 ! (C) Crown copyright Met Office. All rights reserved.		
5 ! For further details please refer to the file COPYRIGHT.txt	5 ! For further details please refer to the file COPYRIGHT.txt		
6 ! which you should have received as part of this distribution.	6 ! which you should have received as part of this distribution.		
7 ! *****COPYRIGHT*****	7 ! *****COPYRIGHT*****		
8 ! SUBROUTINE P_TO_T	8 ! SUBROUTINE P_TO_T		
9	9		
10 SUBROUTINE P_TO_T (	10 SUBROUTINE p_to_t (		
11 &	11 &		
12 ! For temperature.	12 ! For temperature.		
13 IN Field dimensions and pointers.	13 IN Field dimensions and pointers.		
14 & row_length,rows, halo_i, halo_j	14 row_length,rows, halo_i, halo_j		
15 &	15 &		
16 & halo_i_data, halo_j_data, LEVELS	16 , halo_i_data, halo_j_data, levels		
17 &	17 &		
18 ! IN Vertical coordinate levels.	18 ! IN Vertical coordinate levels.		
19 & R_THETA_LEVELS, R_RHO_LEVELS	19 , r_theta_levels, r_rho_levels		
20 &	20 &		
21 ! IN field to be interpolated.	21 ! IN field to be interpolated.		
22 & FIELD_IN	22 , field_in		
23 &	23 &		
24 ! OUT Interpolated field.	24 ! OUT Interpolated field.		
25 & FIELD_OUT	25 , field_out		
26 &	26 &		
27 & )	27 )		
28	28		
29 PURPOSE:	29		
30 !	30		
31 !	31		
32 !	32		
33 HISTORY:	33		
34 DATE VERSION COMMENT	34		
35 -----	35		
36 03/02/06 6.2 Move to C92_2A. P.Selwood	36		
37 !	37		
38 CODE DESCRIPTION:	38 ! CODE DESCRIPTION:		
39 ! LANGUAGE: FORTRAN 77 + CRAY EXTENSIONS	39 ! LANGUAGE: FORTRAN 77 + CRAY EXTENSIONS		
40 ! THIS CODE IS WRITTEN TO UMDP 3 PROGRAMMING STANDARDS.	40 ! THIS CODE IS WRITTEN TO UMDP3 v8.2 PROGRAMMING STANDARDS.		
41 !	41		

fcmdiff -g <file>

Within the working copy.



# Testing, using the Test Harness.

- A single Test Harness is used by
  - code developers
  - daily builds of the UM trunk
  - Release Candidate testing, checking progression between stable UM versions and applying wider set of tests.
- The user determines which tests are performed.
- The test output provides the supporting evidence of any change; in a standard format across a UM system team controlled set of tests.





# Daily, weekly and user tests

automated testing of branches or head of trunk.

Rose Bush @ els032   frum   **trunk\_nightly**   cycles list   jobs list   cylc files ▾   rose files ▾   ■ 3 days ago

[Display Options](#)

«   Page 1 of 12 ~ Entries 1-50 of 120   »   Result loaded 2 minutes ago

[toggle Δt](#)

	housekeep_atmos_linux_n96_amip_eg_1x4	3 days ago	0:05	0:03
script out err				
	rose_ana_linux_n96_amip_eg_atmos_kgo	3 days ago	0:08	0:20
script out err cumf_diff cumf_full cumf_summ cumf_user_stash				
	atmos_linux_n96_amip_eg_1x4 2	3 days ago	0:13	39:10
script out err				
	atmos_linux_n96_amip_eg_1x4 1	3 days ago	0:07	7:55
script out err				
	rose_ana_linux_n96_amip_eg_recon_kgo	3 days ago	0:04	0:27
script out err cumf_diff cumf_full cumf_summ cumf_user_stash				
	recon_linux_n96_amip_eg	3 days ago	0:04	1:43
script out err				
	fcm_make_linux_um_safe_omp	3 days ago	0:00	25:01
script out err				
	housekeep_utils_linux_convpp_32B_vn801_GLOBAL_FF	3 days ago	0:03	0:00
script out err				
	housekeep_utils_linux_convpp_32B_vn800_GLOBAL_FF	3 days ago	0:03	0:01
script out err				
	rose_ana_linux_utils_convpp_32B_vn801_GLOBAL_FF_kgo	3 days ago	0:03	0:03
script out err				
	rose_ana_linux_utils_convpp_32B_vn800_GLOBAL_FF_kgo	3 days ago	0:04	0:04
script out err				



# Testing, using the Test Harness.

- `fcml co fcm:um.x_br /<branch in FCM>`
- `cd` into the local working copy of branch
- `rose stem --group=developer [--group=nightly etc]`



Met Office

# Example Run of rose-stem

r55781\_rose\_stem\_example - exvcylc04 - gcylc

File View Control Suite Help

View 1: running failed... View 2: None

task	state	message	Tsubmit	Tstart	mean dT	ETC
1	running					
▶ EXTRACT	queued					
▶ HPC	succeeded					
▶ HPC_HADGEM_2DAY	running					
▶ HPC_MOGREPS_R	queued					
▶ HPC_N48_OMP_IOS	running					
▶ HPC_N96_AMIP_EG	queued					
▶ HPC_SEUKV	queued					
▶ LINUX	succeeded					
▶ LINUX_N48_OMP_IOS	running					
▶ LINUX_SCM_NWP	queued					

☒ waitin ☒ runahea ☒ hel ☒ queue ☒ submittin ☒ submitte ☒ submit-faile ☒ runnin ☒ succeede ☒ faile ☒ retry

running live 2013/07/16 08:31:48

# Test fail when compared with KGO

```

rose_ana_linux_n48_omp_ios_atmos_kgo.1.1.out - vn8.4.1_rose_stem - Mozilla Firefox
File Edit View History Bookmarks Tools Help
Back Forward Reload Stop Home
file:///home/h03/fruw/cylc-run/vn8.4.1_rose_stem/log/source.html?suite=vn8.4.1_rose_stem&path=job/ro
Metnet Google
Adblock Plus Firebug
Most Visited Getting Started UTF-N Log Browser UTF-W Log Browser UTF-J Log Browser Latest Headlines zap colors #361 (Head of Tru...
MetNet hom... met_EU_ENS... met_THOR... Exeter UM/UM/trunk (lo... rose_ana_linu... #4980 (Rose... FutureReleas... #4983 (Add s... UM/branches...
6 Suite Name : vn8.4.1_rose_stem
7 Suite Host : exvcylc02.metoffice.gov.uk
8 Suite Port : 7766
9 Suite Owner : fruw
10 Task ID : rose_ana_linux_n48_omp_ios_atmos_kgo.1
11 Task Host : els049.metoffice.gov.uk
12 Task Owner : fruw
13 Task Try No.: 1
14
15 [INFO] export PATH=/opt/ukmo/utls/bin:/net/home/h03/fcm/rose-2013-02-14-g469cb96/bin:/opt/intel/composerxe-2011.4.191/bin/intel64:/home/h03/fruw/mpi/mpich2-1.4.1/fort-12.0/bin:/home/h03/fruw/cylc-run/vn8.4.1_rose_stem/bin:/
16 [INFO] export FPATH=/opt/ukmo/utls/lib/ksh:/home/h01/frtc/SCS/lib/ksh:/opt/ukmo/utls/lib/ksh:/opt/ukmo/utls/lib/ksh
17 [INFO] export PATH=/home/h03/fruw/cylc-run/vn8.4.1_rose_stem/share/fcm_make_linux_n48_omp_ios/build-recon/bin:/home/h03/fruw/cylc-run/vn8.4.1_rose_stem/share/fcm_make_linux_n48_omp_ios/build-atmos/bin:/home/h03/fruw/cylc-run/
18 [INFO] export PATH=/home/h03/fruw/cylc-run/vn8.4.1_rose_stem/share/fcm_make_linux_n48_omp_ios/build-recon/bin:/home/h03/fruw/cylc-run/vn8.4.1_rose_stem/share/fcm_make_linux_n48_omp_ios/build-atmos/bin:/home/h03/fruw/cylc-run/
19 [FAIL] Files differ: ../atmos_linux_n48_omp_ios_lx4.1/atmos.foamout2 c.f. /data/nwpl/frum/standard_jobs/rose/n48_omp_ios/vn8.4/atmos.foamout2
20 [FAIL] RH on model levels at end timestep : >10%
21 [FAIL] TOTAL DOWNWARD SURFACE SW FLUX : >10%
22 [FAIL] TOTAL PRECIPITATION RATE KG/M2/S: >10%
23 [FAIL] LS+CONV KG/M2/S: >10%
24 [FAIL] SURFACE : >10%
25 [FAIL] TEMPERATURE ON THETA LEVELS : >1%
26 [FAIL] TOTAL CLOUD AMOUNT MAX/RANDOM OVERLP: >10%
27 [FAIL] SURFACE TEMPERATURE AFTER TIMESTEP : >1%
28 [FAIL] SPECIFIC HUMIDITY AFTER TIMESTEP : >10%
29 [FAIL] CLOUD BASE ASL COVER GT.0.1 OCTA KFT: >10%
30 [FAIL] Files differ: ../atmos_linux_n48_omp_ios_lx4.1/atmos.foamout1 c.f. /data/nwpl/frum/standard_jobs/rose/n48_omp_ios/vn8.4/atmos.foamout1
31 [FAIL] SEA MEAN W/M2: >10%
32 [FAIL] LARGE SCALE RAIN AMOUNT KG/M2/TS: >10%
33 [FAIL] LARGE SCALE SNOW AMOUNT KG/M2/TS: >10%
34 [FAIL] SUBLIM. FROM SURFACE (GBM) KG/M2/TS: >10%
35 [FAIL] X-COMP OF SURF & BL WIND STRESS N/M2: >10%
36 [FAIL] NET DOWN SURFACE SW FLUX BELOW 690NM: >10%
37 [FAIL] SEA MEAN KG/M2/S: >10%
38 [FAIL] FRAC OF SEA ICE IN SEA AFTER TSTEP : >10%
39 [FAIL] Y-COMP OF SURF & BL WIND STRESS N/M2: >10%
40 [FAIL] CONVECTIVE RAIN AMOUNT KG/M2/TS: >10%
41 [FAIL] SEA MN W/M2: >10%
42 [FAIL] SEA MEAN: >10%
43 [FAIL] SURFACE TEMPERATURE AFTER TIMESTEP : >1%
44 [FAIL] CONVECTIVE SNOW AMOUNT KG/M2/TS: >10%
45 [FAIL] Files differ: ../atmos_linux_n48_omp_ios_lx4.1/atmos.surgeou1 c.f. /data/nwpl/frum/standard_jobs/rose/n48_omp_ios/vn8.4/atmos.surgeou1
46 [FAIL] 10 METRE WIND U-COMP B GRID: >10%
47 [FAIL] PRESSURE AT MEAN SEA LEVEL : >0.1%
48 [FAIL] 10 METRE WIND V-COMP B GRID: >10%
49 [FAIL] Files differ: ../atmos_linux_n48_omp_ios_lx4.1/atmos.wfout c.f. /data/nwpl/frum/standard_jobs/rose/n48_omp_ios/vn8.4/atmos.wfout
50 [FAIL] SEA MEAN W/M2: >10%
51 [FAIL] LARGE SCALE RAIN AMOUNT KG/M2/TS: >10%
52 [FAIL] LARGE SCALE SNOW AMOUNT KG/M2/TS: >10%
53 [FAIL] SUBLIM. FROM SURFACE (GBM) KG/M2/TS: >10%
54 [FAIL] X-COMP OF SURF & BL WIND STRESS N/M2: >10%
55 [FAIL] NET DOWN SURFACE SW FLUX BELOW 690NM: >10%
text mode raw
Find: setattr Previous Next Highlight all Match case

```



Testing completed.  
Getting a change into a UM release...



# Ticket summary:

- Communication of the change...
  - what is the vital information that any review needs to know?
  - formalise this communication through TRAC templates....



# Ticket summary:

Met Office (GB) | https://code.metoffice.gov.uk/trac/um/wiki/ticket/343/TicketSummary

wiki: ticket / 343 / TicketSummary Up | Start Page | Index | History

## Ticket Summary #343

To be completed prior to Sci/Tech review *and updated* as required during the review process.

**All developers are expected to have worked through:**

- [Rose documentation](#)
- [UM working practices](#)
- This ticket summary needs to be completed to provide evidence of the impact of each changeset.
- How to supply test evidence.
  - Met Office tickets:
    - are expected to provide evidence from rose stem tests based upon the Met Office provided standard test jobs jobs.
  - Partners with local rose stem suites:
    - are expected to supply as much evidence as possible on the impact of their ticket based upon their rose stem output.
    - the code system reviewer will perform the Met Office rose stem tests on your behalf as part of their code review.
  - Partners without access to a rose stem suite:
    - will require a proxy at the Met Office (a collaborator) to take ownership of the ticket and push it through the Met Office rose stem tests and the subsequent review process on behalf of the partner developer.

**Author:** Paul Eamshaw

---

### Branch

**Code branch**  
[vn10.1\\_retire\\_cruntmc](#)

**Documentation branch**  
[BRANCH\\_NAME](#)

**Testing branch** *Only required if you have altered meta-data and/or added an upgrade macro*  
[r3690\\_test\\_retire\\_cruntmc](#)

---

### Testing

*Testing should use Rose STEM which will test a selection of [standard UM configurations](#).*

### Rose testing summary

Please list the rose stem *groups* that have been tested from [the available groups](#):

Groups:

- a) developer
- b) endgame
- c) metolinux\_idealised
- d) metohpc\_idealised
- e) ukca



# Sci tech review

- The code changes are understood and appropriately made.
- The documentation is sufficient to understand the code change and its impacts. (Ticket, inline code and UMDPs).
- Is familiar with the area of being code updated, preferably a code owner for that UM section.
- If results change previous KGOs, the reviewer must also check that details are provided showing the 'science' impact of the change on forecast performance and that it has been given approval by the configuration owners that are impacted.





# Code System review

- Coding standards are met
- Impact of the change on the UM system.
- Ensure all appropriate testing has been performed, request more if required. If the trunk at risk if this change is applied?
- Only Code system reviewers may commit changes to the trunk!
- Thus the trunk is tightly controlled by a small number of staff.



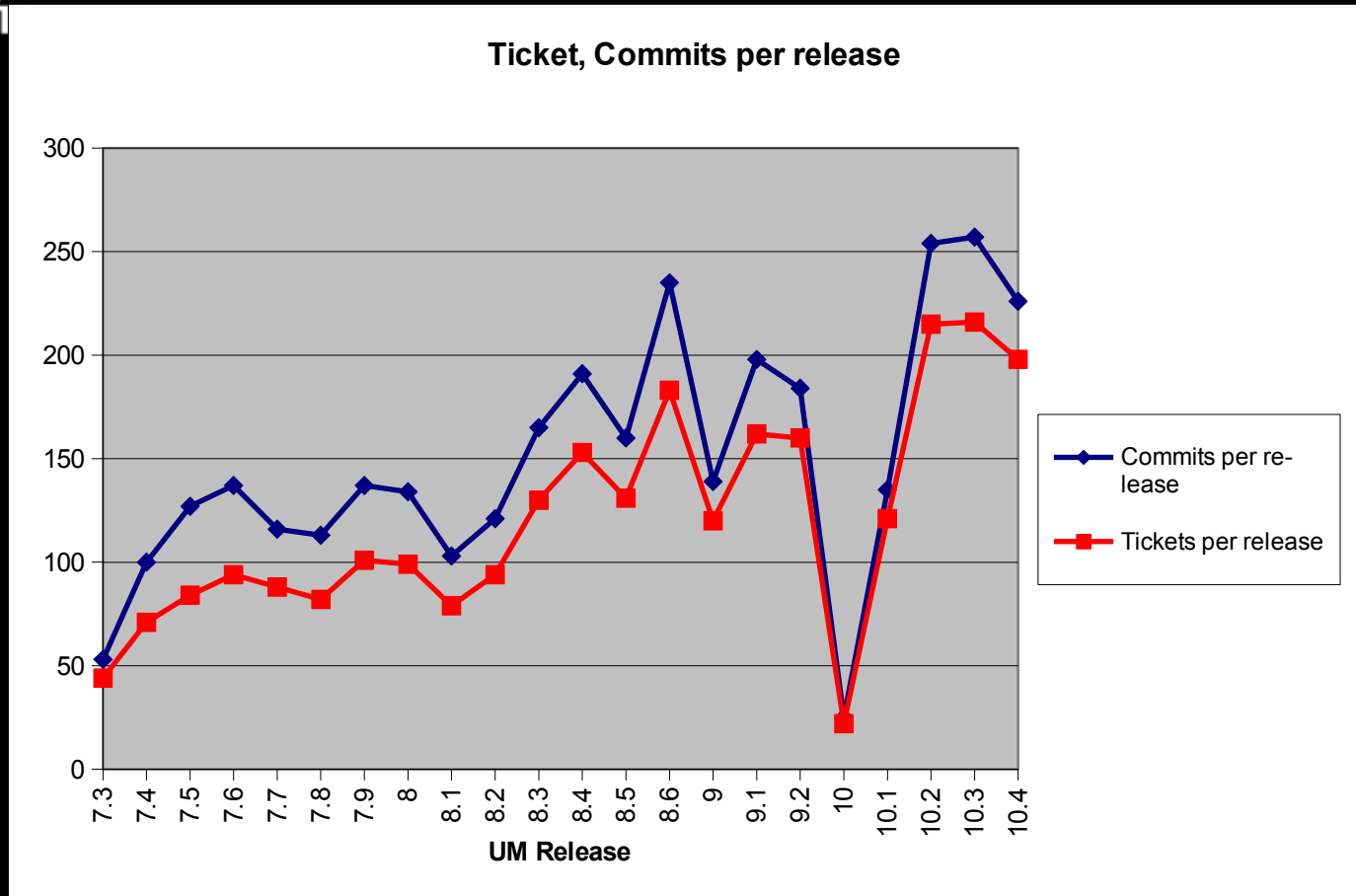
# This is very draconian

- Why all the hassle to get a change on the UM trunk?
- To ensure releases are effectively managed, quality controlled and delivered on time.



Met Office

# Size of recent releases

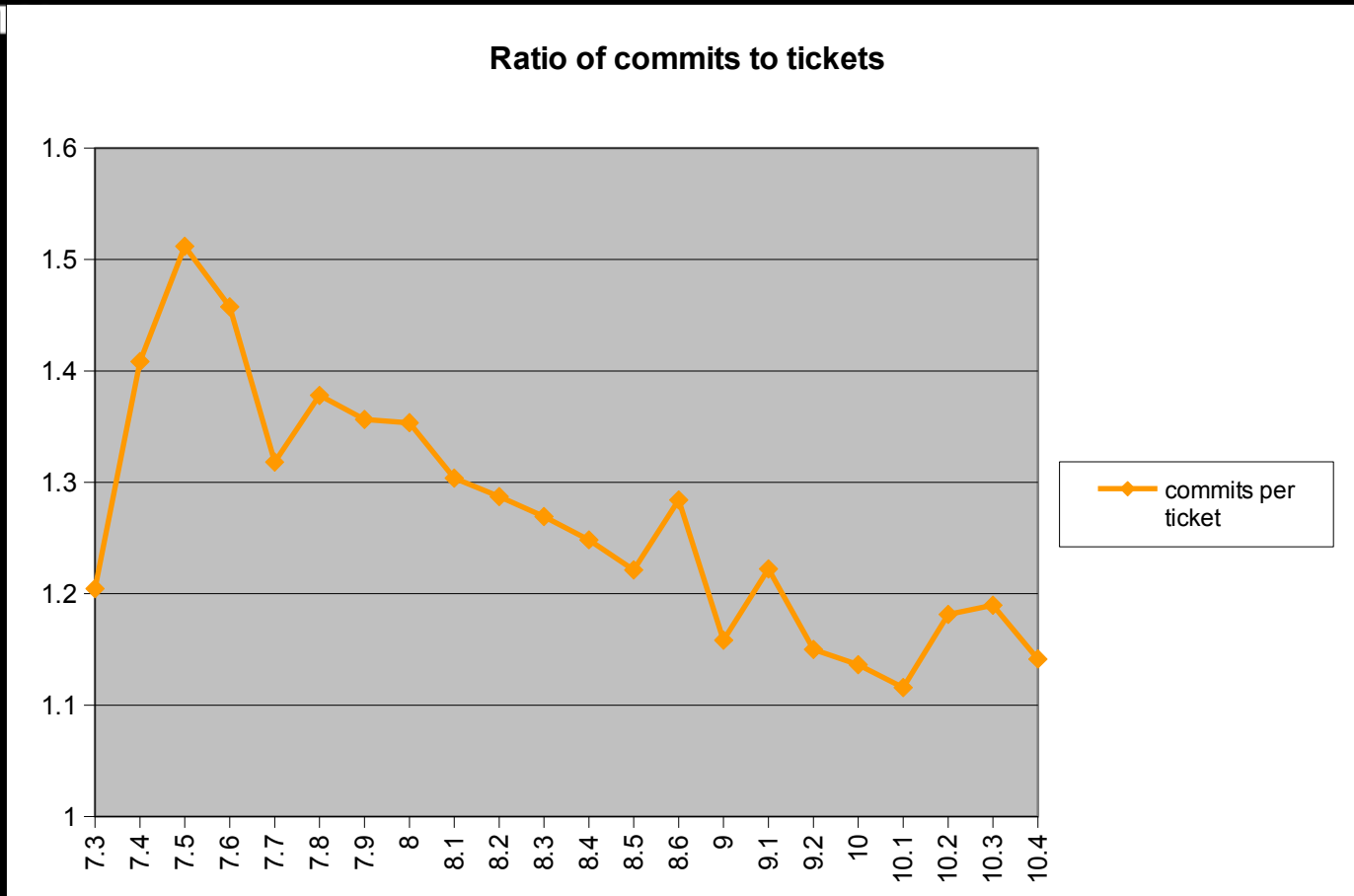


Sizes of releases in terms of tickets and commits



Met Office

# Minimise commits



Aim for perfect release of 1.....