Upgrades to the Regression Test Framework on WAVEWATCH III

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Objectives

- Create inventory of regression tests and switches used in matrix.base and find which ones are missing

- Update matrix.comp to aid in regression test process

Test Inventory

- Inventory of regression tests:
    - 595 configurations tested (MPI)
    - 604 available switch files across all folders
    - 411/604 switch files used

- Inventory of switch files
    - 80/128 possible switches tested

Test Inventory

In regtest folder but not matrix.base

Not in any switch file

BT4	IS1
SCRIPNC	TIDE
WNT2	SEED
CRT0	OASIS
O2a	OASACM
O2b	OASOCM
O2c	COU
T38	MPIBDI

STAB3	IC4	BS1	ARC	
DSS0	NLS	CRT2	CRX0	CRX2
XW0	XW1	WNT0	WNX0	WNX2
PALM	NCC	NCO	NCEP1	NCEP2
O7a	O7b	O8	O12	O13
O14	O15	O16	TDYN	TIDET
S	T	MPIT	NNT	REFT
MPRF	NEC	C90		

These switches listed in v5.16 manual

Updates to matrix.base

- Minor reordering to avoid recompiling
- Minor fixes to typos
- Added missing tests (branches/updateregtests)
  - mww3_test_08
  - ww3_tp2.8
  - Switches: SEED,TIDE, IS1, IC4, SCRIPNC
- Note: ww3_tic2.1 and ww3_tic2.2:
  - ww3_tic 2.1: input_IC1 and input_IC2IS2 identical (switches used: IC1, IS0)
  - ww3_tic2.2: input and input_IC2 switches identical (IC1)
- Identified tests that need to be added

Updates to matrix.comp

- Keep using diff for line-by-line comparison
- Keep removing lines with version number, run date, etc

- Removed wait for response
- Removed case option
  - Now: >> ./bin/matrix.comp [test or all]
- Changed file classification method
- Added subfolder capability (mww3)
- Removed diff output
- Changed output format

Sample Output

- 2 output text files
  - matrixCompFull.out: filename & result of each file compared (old matrix.comp output)
  - matrixCompSummary.out: summary for each work directory
  - Both files start with overview of comp and base dirs, list of identical cases and non-identical cases

Sample Output

- 2 output text files
  - matrixCompFull.out: filename & result of each file compared
  - matrixCompSummary.out: summary for each work directory

```
* test case: mww3_test_01; test run: work_PR1
******************************************************
 found 31 files in base directory
 found 31 files in compare directory
    ww3.68060610.hs are identical
    ww3_outp_tab51.out are identical
    tab51.ww3 are identical
    ww3.68060603.hs are identical
    ww3_strt.out are identical
    ww3.68060608.hs are identical
    ww3_grid.out differ.
    ww3.68060602.hs are identical
    ww3.68060600.hs are identical
    skipped finished
    log.ww3 are identical (filtered)
    tab50.ww3 are identical
    skipped ww3_shel.out
    ice.ww3 are identical (binary)
```

```
* test case: mww3_test_01; test run: work_PR1
******************************************************
 found 31 files in base directory
 found 31 files in compare directory
    27 files are identical
    2 files skipped
    0 files in base directory only
    0 files in comp directory only
    2 files differ
 ww3_grid.out mod_def.ww3 (binary)
```
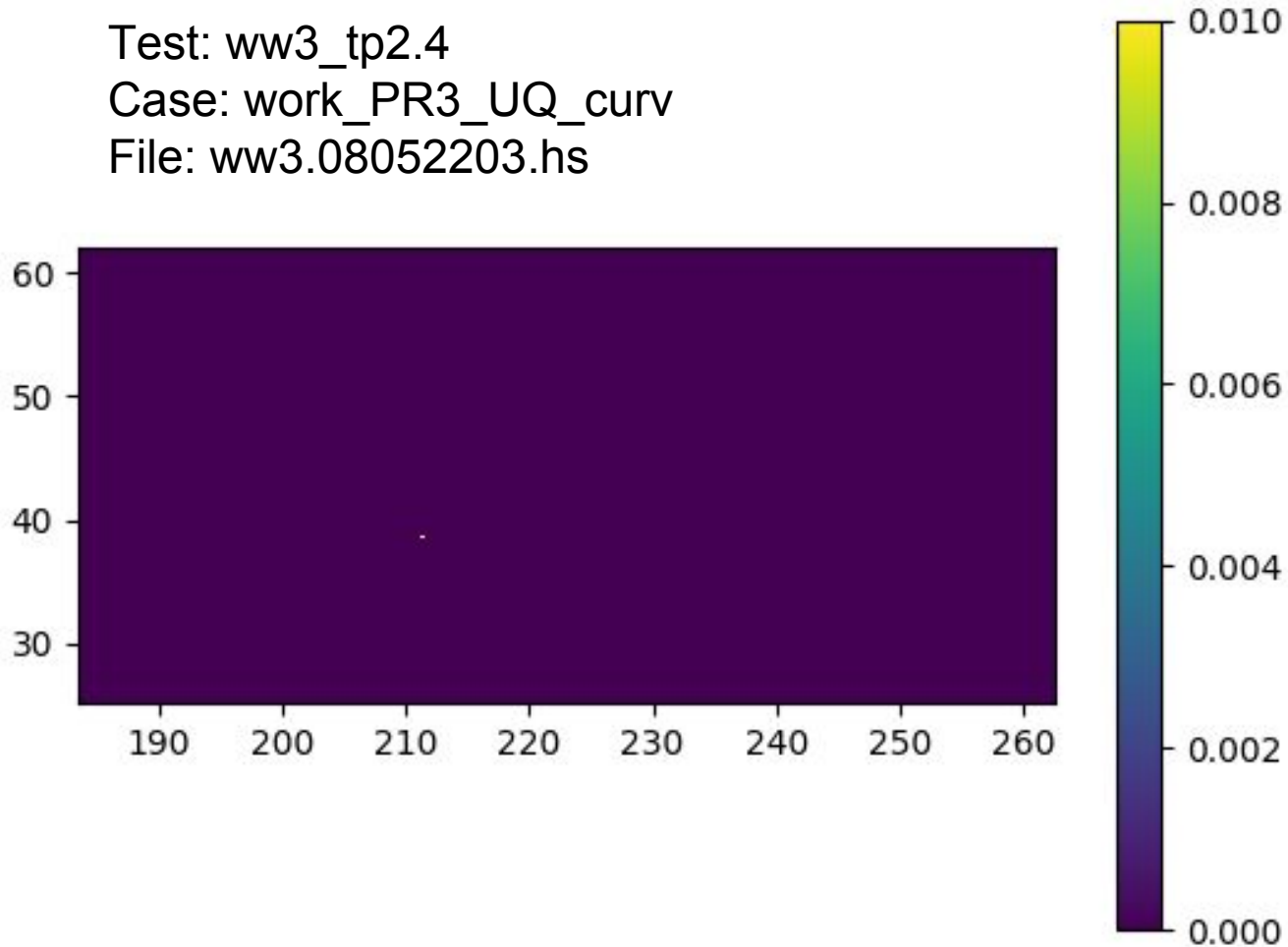
Comparison of numerical output

- Visualize graph numerical difference between output and baseline

Sample Output

Test: ww3_tp2.4
Case: work_PR3_UQ_curv
File: ww3.08052203.hs

Summary

- Identified switches that need to be added to regression test library
- Updated matrix.comp
- Wrote python script that plots difference between outputs from two versions

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