WAVEWATCH III

Development Call
Jun 14, 2017

Topics for Today

- Dates to know for GIT transition
- How to get a VLAB/GIT account
- SVN Cleanup details
- Quick overview of VLAB/GIT
- Overview of WW3 plans for the next year
- Review of dates to know etc.

Dates to Know

June - Cleaning up svn (removing unneeded branches, removing large and binary files)

June 26 - Any branch that will be reintegrated to the trunk pre-GIT transition needs to be ready to go

End of June - Last commits to trunk pre-transition, final clean-up of svn

First of July - Transition to GIT, svn will become read only

How to Get a VLAB/GIT WW3 Account?

- Jessica will submit WW3 dev group as a group to VLAB to get the first round of accounts. To be included in this group, **please fill out the following form**:

  https://goo.gl/forms/QVVWq3a14jC2lrL53

- It only takes 1 day to get new users access to VLAB/GIT and like in the past, you will need to contact the code manager to get yourself or a new collaborator access.

SVN Cleanup and history

- To keep the size of the GIT repository manageable, we will only transfer the history from the 5.16 public release on
- Currently not planning on migrating trac page
  - Any objections?

- Binary files will be removed/ignored in the GIT repository
  - This is due to the fact that you cannot save differences and that when you download the GIT repository you download the entire repository, so it's imperative to keep it small
- We need to look at the size of the current repository and determine if any files should be deleted and not transitioned to GIT, this includes deleting unused branches, etc.

Branch Cleanup

Top level directories to be removed:

- sandbox
- emc2nco
- Tags
  - Alpha
  - Dev (all but one)
  - Released
- Other branches
  - If you have development in a branch and therefore this branch should be saved please let Jessica know. Otherwise, most branches will be deleted. (Note they will be saved in the read-only svn)

Large Files in Consideration for not being migrated

- Any binary file
- trunk/cases directory
- trunk/smc_docs directory
- trunk/regtests/:
  - Any binary file in any regtest will not be migrated to GIT
  - Need to take a look at some of the regtests that are particularly large storage wise
- Are there any files (large or small) that can be deleted?

Current size of trunk:
>> du -sh trunk/*
84M cases
560K guide
14M manual
26M model
266M regtests
149M smc_docs

Current Binary Files in the WW3 Trunk:

This list was created by the following command: grep . -r * | grep 'Binary file'

cases/mww3_data_00/gfs_1d.wind.gz
cases/mww3_data_00/icean_30m.ice.gz
manual/num/partition.eps
regtests/ww3_tp2.12/input_le/partition.ww3
regtests/ww3_tp2.12/input_be/partition.ww3
regtests/ww3_tp2.13/i_index_active_points_zoom2.png
regtests/ww3_tp2.13/j_index.png
regtests/ww3_tp2.13/depth.png
regtests/ww3_tp2.13/distance_on_ii.png
regtests/ww3_tp2.13/distance_on_jj.png
regtests/ww3_tp2.13/i_index_active_points_zoom1.png
regtests/ww3_tp2.14/input/oasis3-mct/doc/oasis3mct_UserGuide.pdf
regtests/ww3_tp2.14/input/oasis3-mct/doc/SCRIPusers.pdf
regtests/ww3_tp2.14/input/r-ww3.nc.OASACM
regtests/ww3_tp2.14/input/toy/r-toy.nc.OASOCM
regtests/ww3_tp2.14/input/toy/toy_coupled_field.nc.OASACM
regtests/ww3_tp2.14/input/toy/grid_toy_model.nc
regtests/ww3_tp2.14/input/toy/toy_coupled_field.nc.OASOCM
regtests/ww3_tp2.14/input/toy/r-toy.nc.OASACM
regtests/ww3_tp2.14/input/r-ww3.nc.OASOCM
regtests/ww3_tp2.15/input/wind.nc
regtests/ww3_tic1.4/input/ice1.nc
regtests/ww3_tic1.4/input/ice5.nc
regtests/ww3_tic1.4/input/ice.nc
regtests/ww3_tp2.8/input/ww3.W005N476_20080310_spec.nc
regtests/ww3_tp2.8/input/ww3.W006N476_20080310_spec.nc
regtests/ww3_tp2.8/input/ww3.W006N489_20080310_spec.nc
regtests/ww3_tp2.8/input/ww3.W0052N489_20080310_spec.nc
regtests/ww3_tp2.8/input/Iroise_AI_UV.nc
regtests/ww3_tp2.8/input/ww3.W006N482_20080310_spec.nc
smc_docs/SMCG_TKs/linuxspectrum.clr
smc_docs/Rotated_Grid.pdf
smc_docs/SMC_Grid_Guide.pdf
smc_docs/SMC_Introductn.ppt

install_ww3_svn

- How many people use install_ww3_svn?
- Do we want/need to have an install_ww3_git?

The following slides give an overview of Virtual Lab

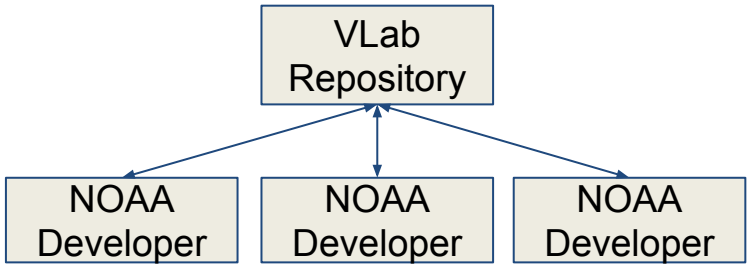
Slides courtesy of
Ken Sperow/ Steve Smith
NWS/MDL/CIRA

Git

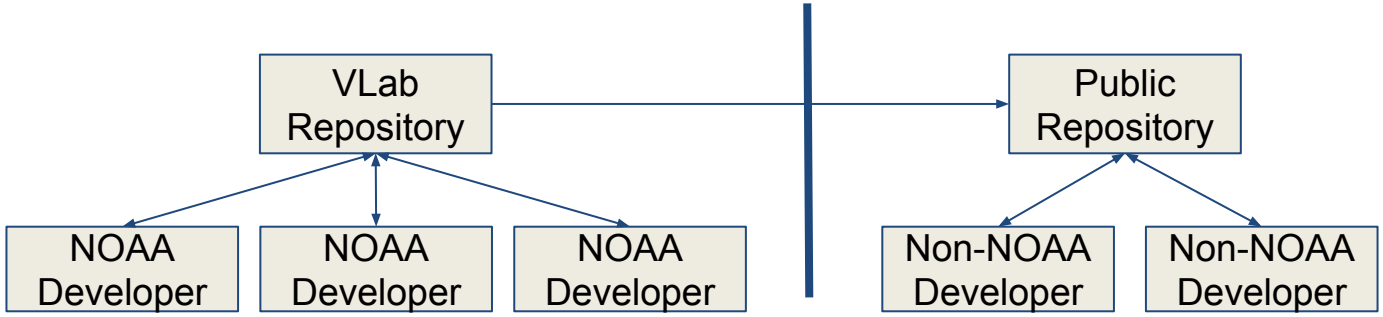
- Built for speed and scale
- Repository includes branches and tags natively
- Branching, merging, tagging is easy and fast
- Created by Linus Torvalds (creator of Linux)
- Each copy of the project tree (working copy) includes the entire repository

Git - Distributed Version Control System

- Can use a centralized workflow



- Designed to support distributed development workflows



Virtual Lab

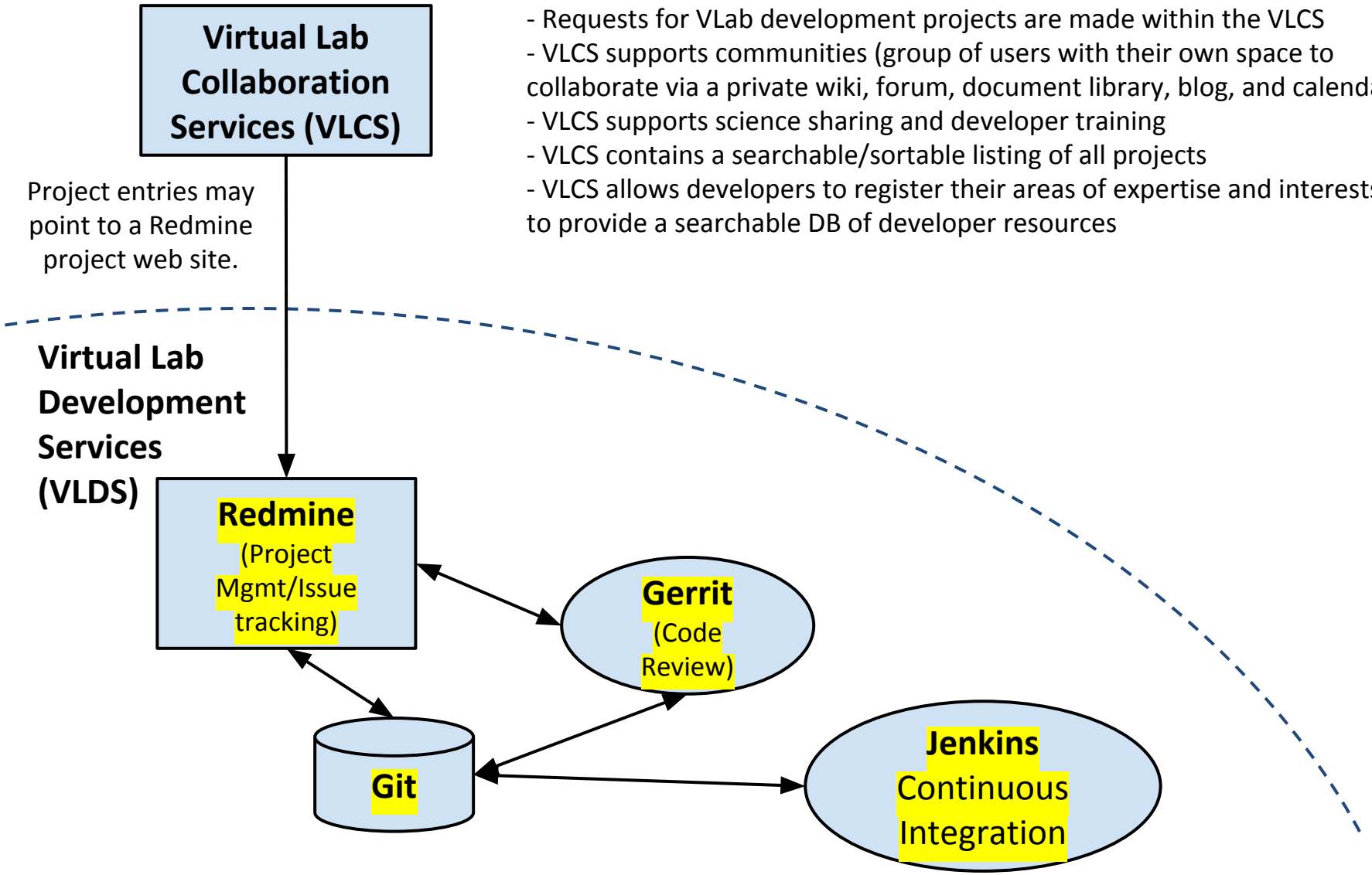
The VLab provides an environment where collaboration and innovation among geographically diverse NOAA scientists and developers can thrive.

VLab Components

The VLab is comprised of two main components:

1. Virtual Lab Collaboration Services (VLCS)
2. **Virtual Lab Development Services (VLDS)**

Virtual Lab High Level View



- Requests for VLab development projects are made within the VLCS
- VLCS supports communities (group of users with their own space to collaborate via a private wiki, forum, document library, blog, and calendar)
- VLCS supports science sharing and developer training
- VLCS contains a searchable/sortable listing of all projects
- VLCS allows developers to register their areas of expertise and interests to provide a searchable DB of developer resources

VLab Development Services

- Provides services and a framework supporting development to NOAA developers and partners.
- Services include
  - Project management
  - Issue tracking (similar to “tickets” in Trac)
  - Revision control
  - Code review
  - Continuous integration

VLab Development
High Level Process

- Development code resides in the VLab in Git repositories
- Development issues are tracked in the VLab's Redmine Project
- Development code is checked in through the VLab's Git repositories
- Development code is related to issues through commit messages

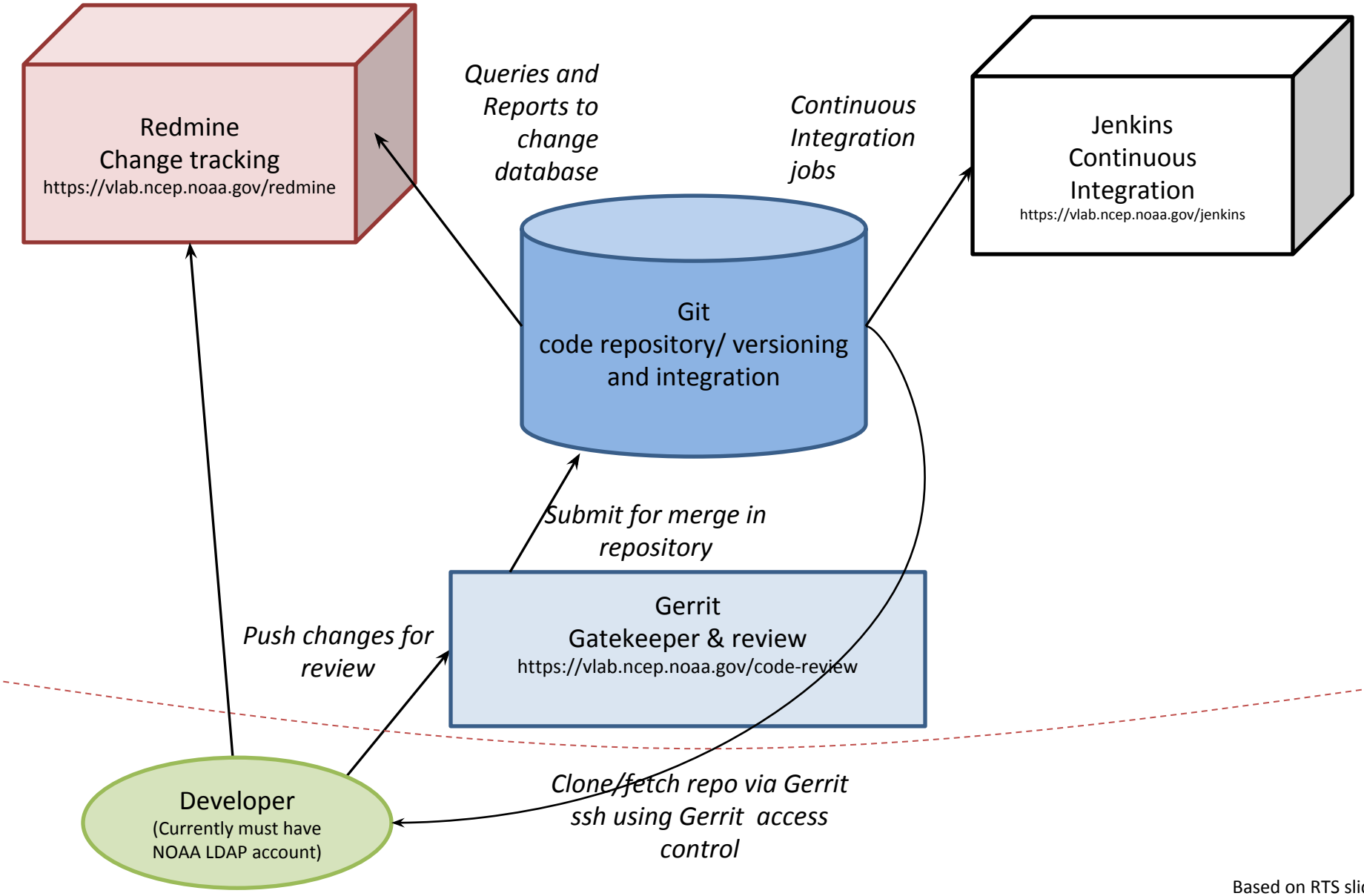
VLab Development
High Level Process (cont.)

- Development code is reviewed through the VLab in Gerrit
- Development code is verified in the VLab
- Compiling and integration testing is completed outside of the VLab for EMC code

VLab Services Details

- Project management and issue tracking - Redmine
- Revision Control
- Code Review - Gerrit
- Continuous Integration - Jenkins

VLab Development Services Architecture



Based on RTS slide

Development in VLab

Redmine

- Web site that supports project management
  - Issue tracking
  - WIKI
  - Browse project repository
- User logs in via Google SSO or their NOAA LDAP credentials
- Administrator or project manager assigns members to projects with appropriate roles
- Import tool available to migrate issues and wiki pages from Trac

- Help is available through VLab wiki

Development in VLab
Gerrit

- Clone repository - like svn checkout

```
git clone gerrit:PROJECT_ID
```

- Make code changes locally, commit, and push to Gerrit for review

```
git commit -a -m "VLab issue #XXX. Fixes …"
git push gerrit HEAD:refs/for/master
```

- If configured, reviewers are notified of review request

Development in VLab
Gerrit

- Reviewers review code in Gerrit
  - Downloading patches locally to verify changes work as is intended
  - Making comments inline
  - Emails are generated
  - Amend commit and re-push until perfect!
- Approved and reviewed code is merged into the specified branch in the project's repository

Development in VLab
Gerrit

- Multiple roles
  - Reviewers - able to push changes for review and review code
  - Approvers - able to approve changes
  - Submitters - able to merge approved changes
  - Integrators - developers with admin privileges
  - Owners - can update roles
  - Verifiers - can verify a change -- typically automated through Jenkins

Development in VLab
Jenkins

- Provides a web based continuous integration tool
  - Jenkins can be used to automate the verification and testing of checked in code:
    - Does code build?
    - Do unit tests execute properly?
    - Do custom checks verify (e.g., is there an associated Redmine ticket assigned to the developer?)
  - Jenkins can also be used to schedule builds based on a cron pattern

More Specific How To’s for VLAB, GIT, and Gerrit will be coming in the future!

REGTEST updates

- NCEP has a summer intern Yukino Nagai who will be helping import the regtest system into Jenkins
  - If you have any ideas on regtests that should be added or other ways we can cleanup or improve the current regtest system please let me know!

WW3 Dev Group Planned Updates For Next Year

Coupling

- ESMF (NRL/NCEP)
- NEMO (Will/Bash, UKMet)
- OASIS, coupling NEMO and CICE (IFREMER)

WW3 Dev Group Planned Updates For Next Year

Grid Type Updates

- Implicit unstructured grid (Roland)
  - Domain decomposition
  - SWE?
- SMC grid updates (UKMet)
  - Refraction bug fix
  - Parallelization updates
  - Save only wind for sea points only
- Rotated pole (UKMet)
  - Bugfix to set all directional outputs to standard pole grid north
  - Include rotation settings in ww3_grid.inp &RTD namelist input
  - Save only wind for sea points only
- Tripolar directional singularity (NCEP)

WW3 Dev Group Planned Updates For Next Year

Physics

- Updates on ST6/7 (Babanin)
- IC3 optimization (NRL)
- IC5 wind-wave module (Babanin, NRL)
- GKE nonlinear term (Babanin with Odin Gramstad)
- Directional spectra of source functions (wind input and whitecapping dissipation) (Babanin)
- Nearshore terms such as vegetation dissipation (NCEP)
- Scalable quadruplet calculations (van Vledder)
- ST4 (IFREMER)
  - test 405, option to bypass cumulative term
  - inline computation
  - restructure?
  - bimodality
  - separation of stress calculation using FLD1/2
- Depth induced breaking (IFREMER colleagues)
- TSA optimization/parallelization (Will/Bash)
- Wave/ice scattering in marginal ice zones and blending with other ice terms (Will/Bash)

WW3 Dev Group Planned Updates For Next Year

General updates

- New makefile (Roland)
- Netcdf updates (NRL)
- Interpolate initial condition from different grid (NCEP)
- Namelist inputs for grid, shel (IFREMER)
- new IO options (IFREMER)
- Data assimilation (NCEP, IFREMER)
- Additional options for partitioning scheme (wind speed cut-off, topographic partitions only) (UKMet)
- ww3_ounf compatibility with SMC grid (generates regular grid or sea-point only netCDF files) (UKMet)

Currently Planned WW3 Dev Call Presentations

Breaking for the rest of the summer with the exception of a possible GIT tutorial at some point

Sept: DA at NOAA - Stelios Flampouris

Oct: Coupling

Nov: Comparing physics packages - Qingxiang Liu, Univ of Melbourne

Last Trunk Merges

- Changed file access mode from DIRECT to STREAM in w3iorsmd.ftn
- switches LRB4 and LRB8 were removed
- system tracking was optimized

Review: Dates to Know

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* The code freeze and code clean up (allocate/dellocate, memory leaks, update guide, etc) has been postponed. The only code freezes that will occur for now are for transitioning to GIT. We would still like to do a cleanup at a later time.

Things to do:

- If you created any of the large/binary files whether in a regtest or elsewhere, start thinking of how it can be removed from the repository.

- **Fill out the following form** to be on the list to get at VLAB/GIT account:

  https://goo.gl/forms/QVVWq3a14jC2lrL53

- Let Jessica know if:
  - Your branch needs to be migrated to GIT
  - You are planning to merge anything back into the trunk pre-GIT transition
  - Have ideas for regtests
  - Have a presentation in mind for a future development call