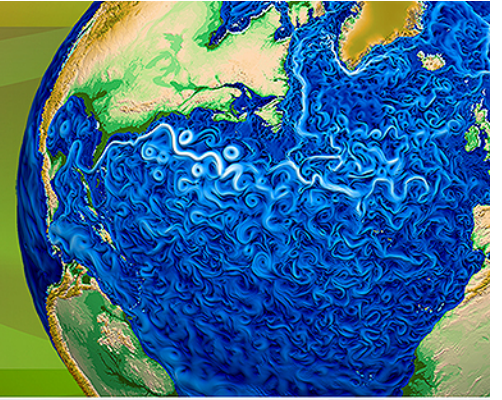




Accelerated Climate Modeling  
for Energy



# Agile Project Management – Perspective and Status

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LLNL

# Overview

- ACME Achievements
  - Transparent Communication Mechanism
  - Adoption of Agile Project Management Methodology
  - Agile Model Development Cycle
- Status on Realization and Compliance
  - Communication Status
  - ACME Roadmaps, Group's Roadmaps, Plans and Quarterly Reports
  - JIRA implementation of Quarterly Plans

# Achievement: Transparent Communication

## ACME Decisions and Accomplishments Towards Transparent Communication Mechanisms

- Confluence
  - Wiki, Documentation, Calendar, Meeting Notes, Roadmaps and Planning, Reports,
    - comments and notifications
    - transparent and integrated
- JIRA
  - online task tracking integrated with Confluence - open to all and transparent
- GoToMeeting
  - screen sharing conferencing - communication tool open to everyone

# Achievement: Adoption of Agile Methodology

## Agile project management adopted in ACME

- Continuous improvement
  - Iterative and incremental planning
  - Flexible realization, task teams oriented
  - Accountability for deliverables at quarterly intervals
  - Retrospective, and improvement to planning
- Rapid development through
  - Short living tasks (2 to 6 weeks)
- Requiring a deliverable
  - Every task has a deliverable
    - code, documentation, design plan doc, journal article, published data, diagnostic test webpage
- Small development task teams with designated task leader
  - ACME organization is structured around tasks
- Task tracking online software – JIRA, provides
  - Focused planning
  - Transparency
  - Automated reporting
  - Project oversight
  - Dashboards overviews

# Achievement: Agile Development Cycle

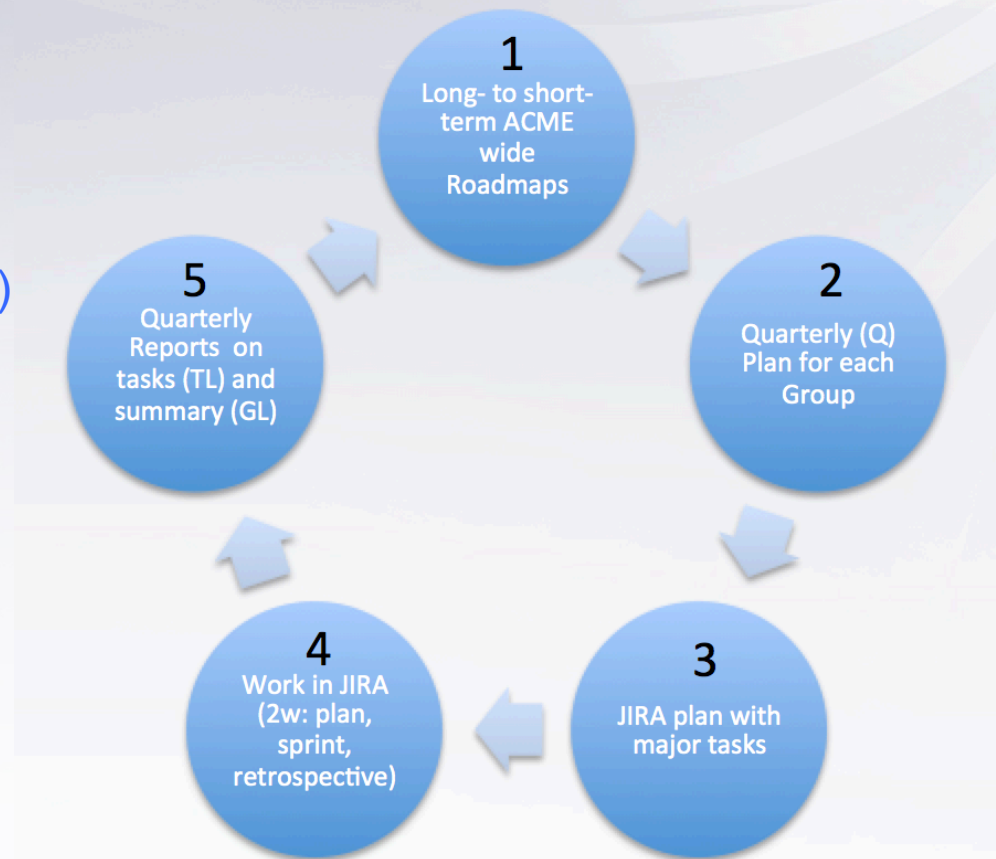
1. Long to short term (10-Year, 3-Year, 1-Year) Roadmaps (AL)
2. Short term (Q) plans (GL)
3. JIRA plan with major tasks (GL/TL)
4. JIRA sprint/retrospective (TL)
5. Quarterly Reports: Tasks (TL) and Summary by Group Leaders (GL)

Rebase #1 and Repeat

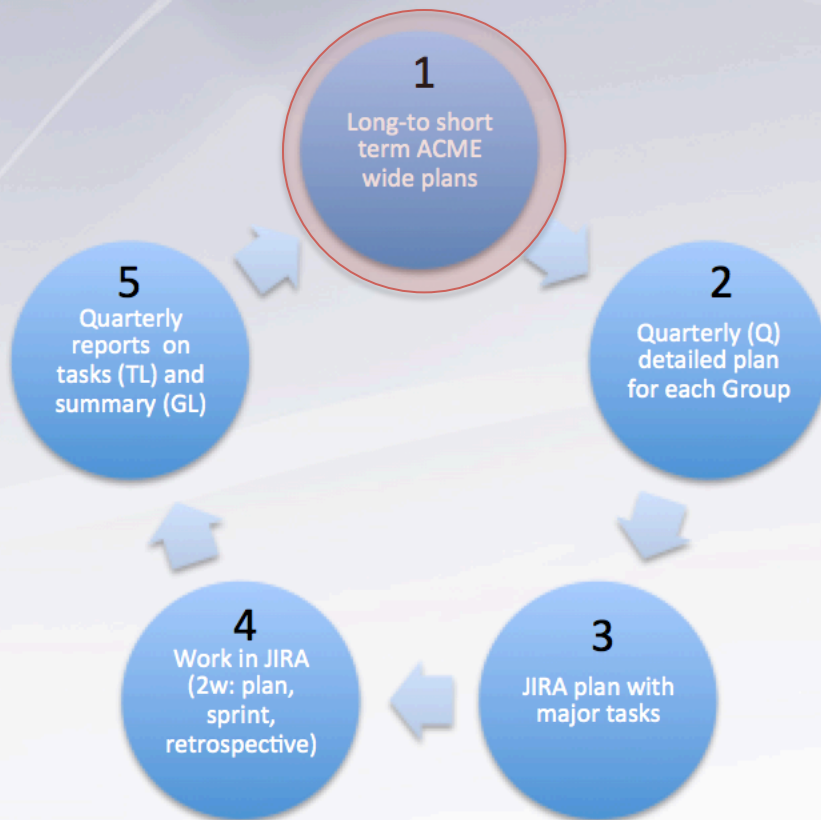
GL: Group Leaders

TL – Task Leaders

AL – ACME Leadership



# 1. Long-to-Short Term ACME Plans



Pages / Council / ACME Roadmap - from proposal

## 10 Year Roadmap

Created by Renata McCoy, last modified on Oct 14, 2014

### The 10-Year Goal

Over the next 10 years, the ACME project will assert and maintain an international scientific leadership position in the development of Earth system and climate models at the leading edge of scientific knowledge and computational capabilities. With its collaborators, it will demonstrate its leadership by using these models to achieve the goal of designing, executing, and analyzing climate and Earth system simulations that address the most critical scientific questions for the nation and DOE.

### The ACME 10-year Roadmap

ACME will achieve this goal through four intersecting project elements:

- a series of **prediction and simulation experiments** addressing scientific questions and mission needs;
- a well documented and tested, continuously advancing, evolving, and improving **system of model codes that comprise the ACME Earth system model**;
- the ability to use effectively **leading (and "bleeding") edge computational facilities** soon after their deployment at DOE national laboratories; and
- an infrastructure** to support code development, hypothesis testing, simulation execution, and analysis of results.

Relationships Among Simulation and Architecture Roadmaps

Figure 1 depicts the ACME Project Roadmap, showing the relationships among the first three major project elements: the simulations, the modeling system to perform those simulations, and the machines on which they will be executed. Unlike the other three elements that have distinct but overlapping phases, the fourth element, the infrastructure, will evolve continuously based on the requirements imposed by project needs.

# 2. Quarterly Detailed Group Plan



Performance Group

Pages / Performance Group / Y1H1 Performance Tasks

33 JIRA links

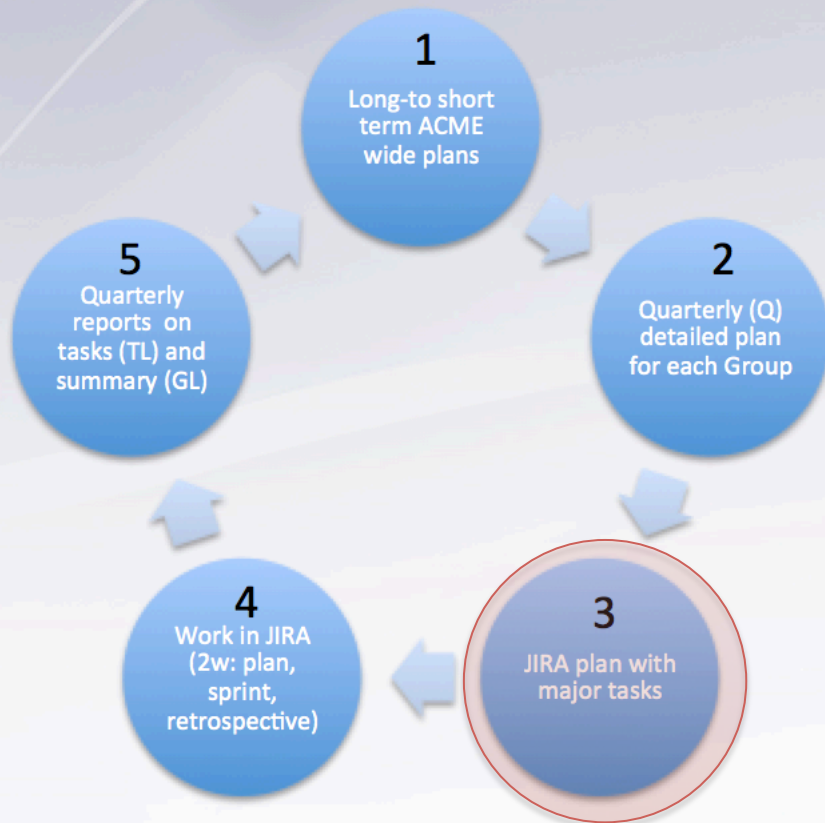
## Y1Q2 Performance Task Plan

Created by Renata McCoy, last modified on Nov 12, 2014

### Epics, Milestones, Tasks and Stories

- Performance Data Capture (Patrick Worley) (ID #C1.1)**
  - Performance Data Capture and Benchmarking [PG-1 OPEN](#)
  - a. Support for performance data capturing and storage, current and new development [PG-2 OPEN](#)
  - b. Performance benchmarking for watercycle experiment [PG-3 OPEN](#)
  - c. Performance benchmarking for BGC experiment [PG-4 OPEN](#)
  - d. Performance benchmarking for proto-cyosphere experiment [PG-5 OPEN](#)
- Performance Tracking and UI (Ben Mayer ?) (ID #C.1.3)**
  - Automatic performance tracking, UI and database [PG-6 OPEN](#)
  - a. Support for multiple sites [PG-7 OPEN](#)
  - b. Database design and setup [PG-8 OPEN](#)
  - c. Data ingest [PG-9 OPEN](#)
  - d. User Interface [PG-10 OPEN](#)
  - e. Plotting function [PG-11 OPEN](#)
- Performance Tracking Infrastructure within Workflow (Ben Mayer) (ID #C1.1.4)**
  - Performance Tracking Infrastructure within Workflow [PG-12 OPEN](#)
  - a. Configuration for User Interface, package generation [PG-13 OPEN](#)
  - b. Hooks for post-processing [PG-14 OPEN](#)
  - c. Automated data transfer [PG-15 OPEN](#)
  - d. Data collection and reporting [PG-16 OPEN](#)
  - e. Data storage for workflow [PG-17 OPEN](#)
- Internode Performance (Hans Johansen) (ID #C2)**
  - Internode Performance and Optimization [PG-18 OPEN](#)
  - a. Communication and Load Balancing Instrumentation and Optimization [PG-19 REOPENED](#)
  - b. Identify Optimized Coupled System Load Balancing [PG-20 OPEN](#)
  - c. I/O Performance [PG-21 OPEN](#)
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  - c. Profile ACME\_v0 in representative production-mode runs on Edison [PG-25 OPEN](#)
  - d. Evaluate compilers and compiler flags on Titan and Mira [PG-26 OPEN](#)
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  - b. Hybrid MPI/OpenMP in MPAS-O [PG-31 OPEN](#)
  - c. MPI Optimization [PG-32 OPEN](#)
  - d. On-node optimization [PG-33 OPEN](#)

# 3. JIRA Plan for Major Tasks



Pages / Performance Group / Y1H1 Performance Tasks

33 JIRA links

## Y1Q2 Performance Task Plan

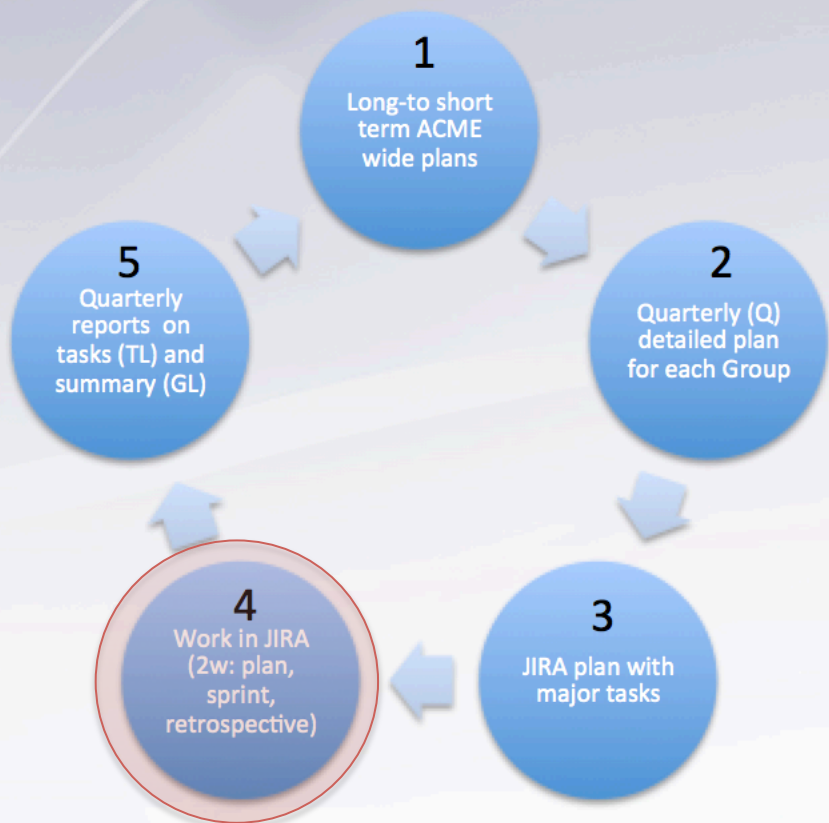
Created by Renata McCoy, last modified on Nov 12, 2014

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  - d. On-node optimization [PG-33 OPEN](#)



# 4. JIRA Tasks – 2 Week Sprints



**Performance Scrum**

QUICK FILTERS: Only My Issues Recently Updated

EPICS

- All issues
- Performance Data Capture
- Performance tracking and UI
- Performance Tracking Infrastructure
- Internode Performance
- On-Node Performance
- MPAS Performance
- Issues without epics

**Sprint 1** 2 issues

- PG-2 Support for performance data capturing and st  
Performance Data Capture
- PG-21 I/O Performance  
Internode Performance

**Sprint 2** 1 issue

- PG-7 Support for multiple sites  
Performance tracking and UI

**Backlog** 24 issues

- PG-3 Performance benchmarking for watercycle exp  
Performance Data Capture
- PG-5 Performance benchmarking for proto-cyospher  
Performance Data Capture
- PG-4 Performance benchmarking for BGC experime  
Performance Data Capture
- PG-8 Database design and setup  
Performance tracking and UI
- PG-9 Data ingest  
Performance tracking and UI
- PG-10 User Interface  
Performance tracking and UI

**Details**

Performance Group / PG-3

Performance benchmarking for watercycle experiment

Status: OPEN

Component/s: Data Capture

Labels: None

Affects Version/s: None

Fix Version/s: None

Epic: Performance Data Capture

Reporter: Renata McCoy

Assignee: Unassigned

Created: 07/Nov/14 2:25 PM

Updated: 20/Nov/14 8:18 AM

Issue Links

mentioned in

- Y1Q2 Performance Task Plan

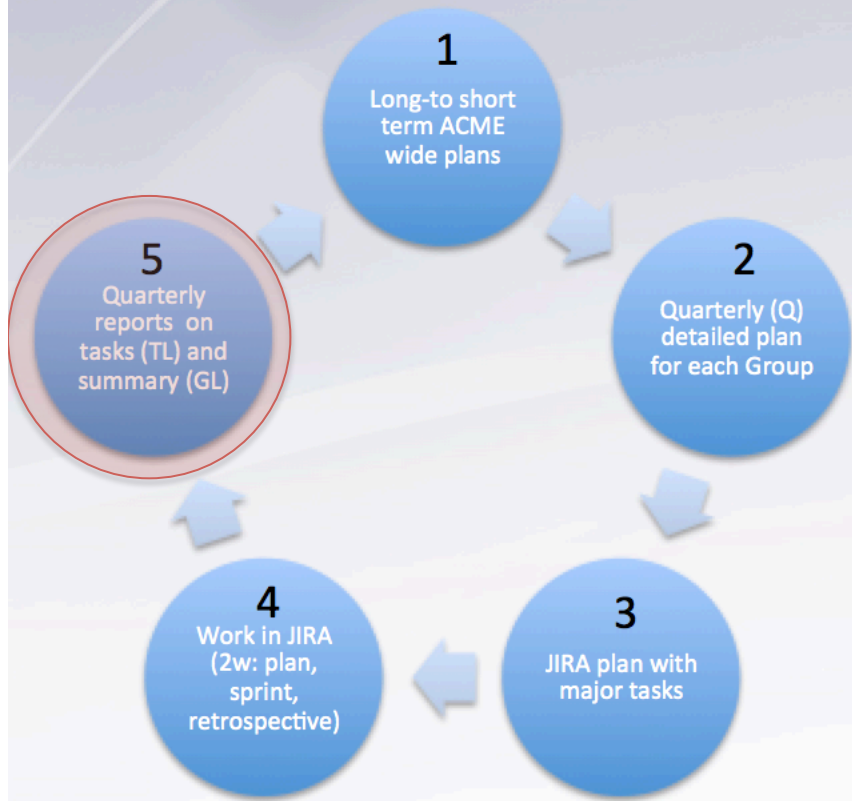
Description

There is no description content

Comments

There are no comments

# 5. Quarterly Reports



Confluence interface showing a page titled "Y1Q3 - Surface model interactions".

**Y1Q3 - Surface model interactions**  
Created by Susannah Burrows, last modified by Renata McCoy just a moment ago

1.Group	Atmosphere
2.Task	Surface Model Interactions
3.ID	M7, P1
4.Epic #s	AG-24, AG-28
5.Task Lead	@Susannah Burrows
6.Report Status	<b>DONE</b>
7.Delivered	1 out of 2 done; remaining task should be completed within the next week or so (needs to be merged to master).
7.On Schedule	<b>BEHIND</b>
8.Problems	<b>NO</b>

Team Members:  
@Hailong Wang, @Susannah Burrows, @Yun Qian

Summary of Progress

**Integration of aerosol improvements with surface models of snow and ice**  
The improved treatment of aerosol deposition onto snow and ice has been checked in to a GitHub feature branch, and a PR has been issued (<https://github.com/ACME-Climate/ACME/pull/167>). These changes should be merged to master soon.

**Implementation of capabilities to simulate new biogeochemical surface interactions**  
A functioning implementation of the offline sea spray OM parameterization into CAM now exists, but some additional evaluation is needed before porting this code to ACME. Evaluation will be a task for Y1Q4.

Report on Individual Tasks for Y1Q3

#	Task	Deliverable Description	Delivered	Priority	Blocked	Problems	Notes	Link To Deliverable
1	Integration of aerosol improvements with surface models of snow and ice	Port model aerosol deposition improvements into ACME – code in ACME "master" branch	No	Critical	No		This is very close to completion, as changes have now been submitted for integration to master in PR 167. <a href="https://github.com/ACME-Climate/ACME/pull/167">https://github.com/ACME-Climate/ACME/pull/167</a> Next steps: add changes for CLM 4.5.	
2	Implementation of capabilities to simulate new biogeochemical surface interactions	Implementation of offline sea spray OM parameterization into CAM	Yes	Critical	No		A working version of the "offline" code in CAM now exists, but some further evaluation is still needed in Y1Q4.	

JIRA Tasks

Key	Summary	T	Created	Updated	Due	Assignee	Reporter	P	Status	Resol
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# Why this structure?

1. Incorporates both planning and agility
2. Enables easy reaction to changes, through rebasing, quarterly planning, sprint planning mode
3. JIRA forces detailed planning for the 2 week long sprints and forces tasks definition for every member of the team
4. By requiring deliverables with each major task, we make sure every task produces a piece of a product
5. The retrospective and rebasing makes sure our plans evolve with changing environment, changing machines, evolution of our knowledge and any other changes.

# Important points in strategy



1. ACME development is an iterative, **agile** process
2. It does rely on **integrated** (not divided into groups or components), progressively more detail **ACME Roadmaps** (10-, 3-, 1-Year Roadmaps)
3. These roadmaps are **adjusted** regularly ( 1-Year is adjusted every 6 months, 3-Year every 1 year, and 10-Year every 3 years)
4. Group's **Quarterly Plan** is **static** and starts and **comes from** this Group's **1-Year Roadmap**
5. **Quarterly Plans** for the next quarter are to be **prepared 6 weeks after** the start of a current quarter
6. **JIRA tasks come from the Group's Quarterly Plans.**

# Realization: Communication

## Working well:

- Excellent communication across our distributed project
- Vigorous, transparent discussion on Confluence
- Very good compliance in using Confluence, no emails
- Good documentation

## To be improved:

- We may put some effort into better organization
- More documentation

# Realization: Roadmaps, Plans, Reports

## Established:

- 3-Year ACME Roadmap, 12-Month Roadmaps for ACME and for each group
- Quarterly Reports procedure

## To be improved:

- Quarterly planning for each group
  - granularity,
  - on-time plans finalization
- On-time Quarterly Reports

## Should repeat:

- We had a great road-mapping all-day conference call in April, we should have one every quarter

# Realization: JIRA Implementation

## Established:

- JIRA structure and procedures with 2-week required focused planning (2-week 'sprints') (required as of April 2015)
- JIRA projects for each group
- All groups work in JIRA

## To be improved:

- JIRA tasks need to originate from Quarterly Plans
- Planning for a 2-week sprint seems to still be a challenge
- Few groups follow the 2-week sprint requirements
- Cross-project similar granularity for tasks
- Users understanding of requirements

# Summary

- ACME Achievements
  - Transparent planning, working and discussions – everything is open to all
  - Very good communication across whole project
  - Established and implemented agile model development procedures
- Status on Realization and Compliance
  - Need to improve on Quarterly planning which feeds into JIRA
  - JIRA compliance with sprints



# Thank You !