

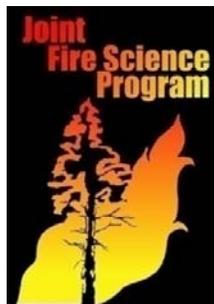
# The Interagency Fuels Treatment Decision Support System (IFT-DSS)

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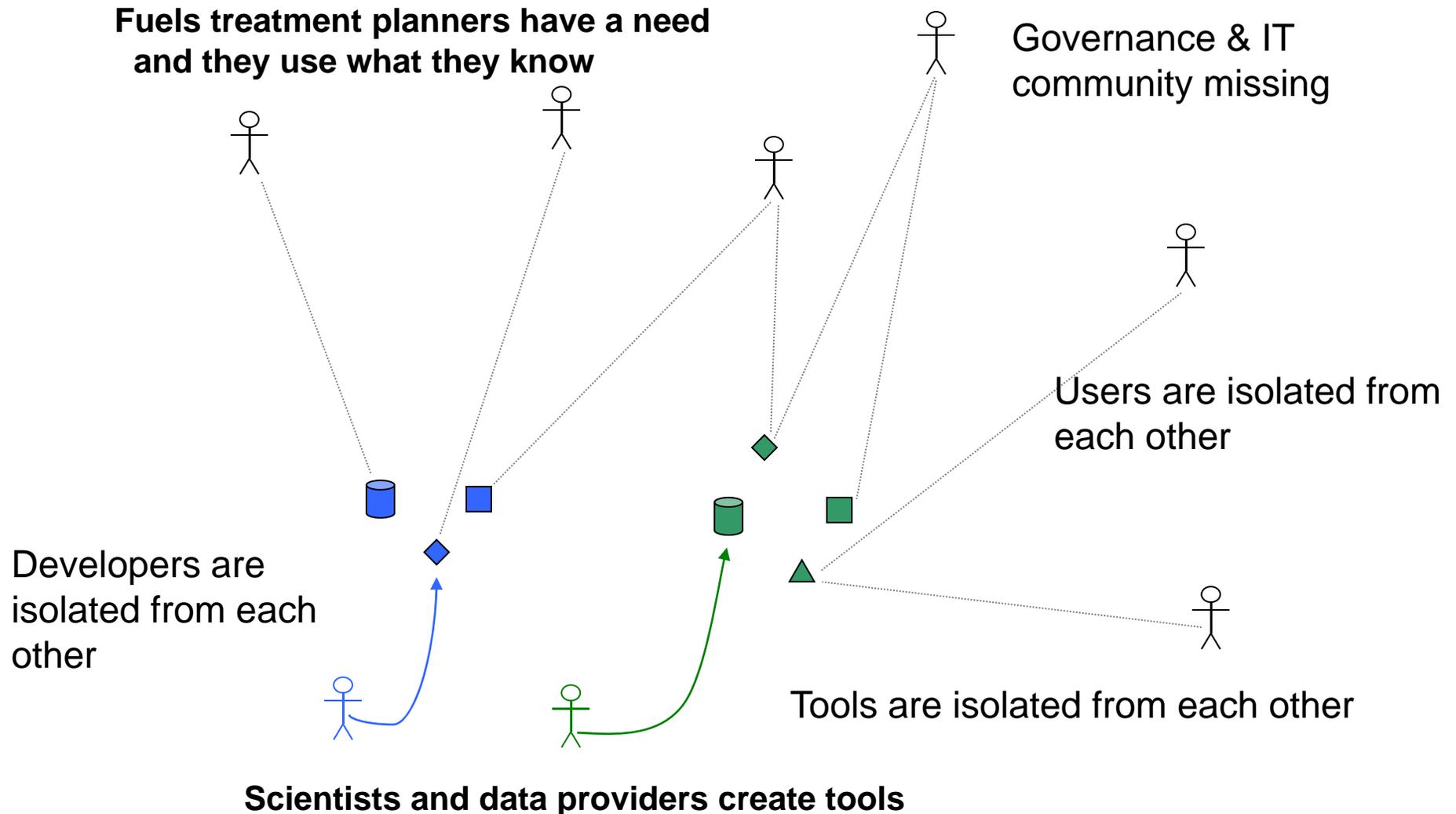


# Overview of Presentation

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- **Brief introduction and background**
- What does IFT-DSS do for users?
- How is IFT-DSS related to other systems?
- The stakeholder operational environment
- The emerging vision for Fire Software Systems

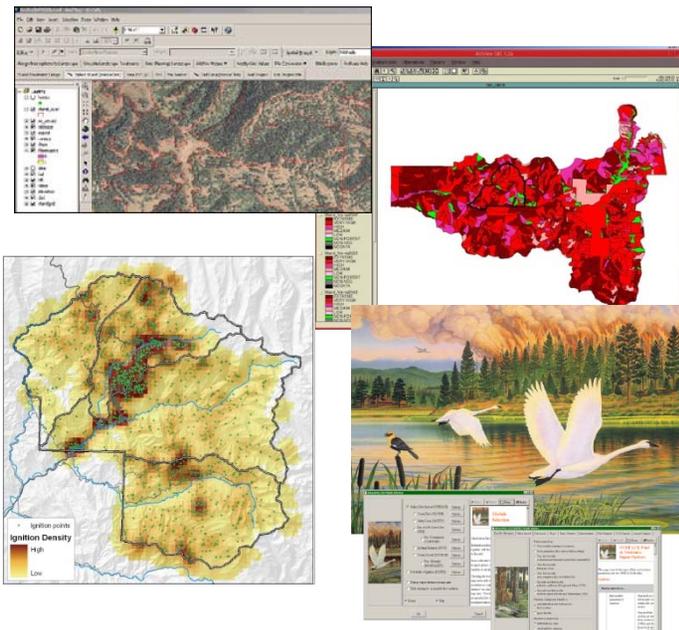
# Current Condition: Fuels Treatment Community



# Current State of the Fuels Treatment Software

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- Currently an assortment of data, software applications and systems



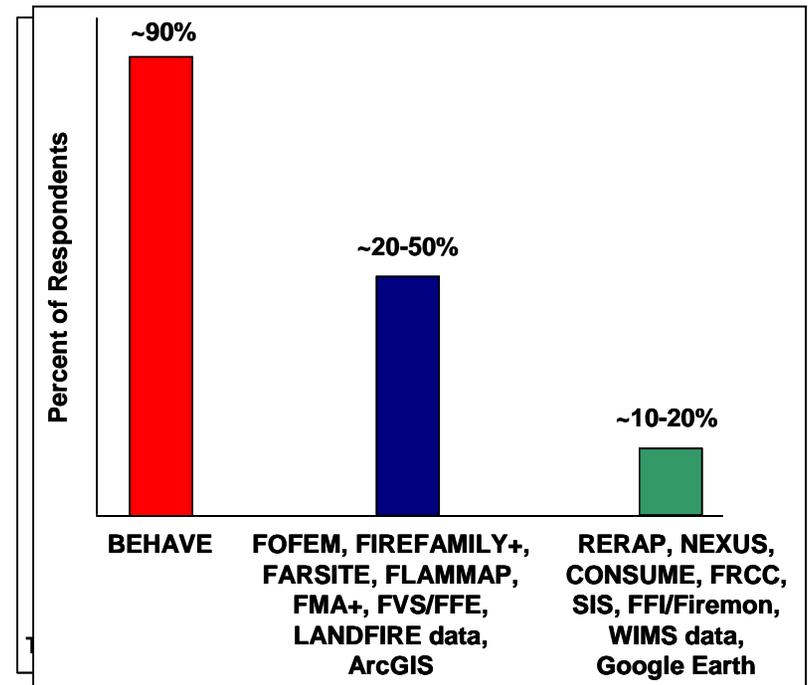
- ❖ Over 400 software tools of all types
- ❖ Not all are accessible to the community
- ❖ Most are problem-specific
- ❖ Some are comprehensive but only support specific data and use-cases
- ❖ It is difficult to “string” them together
- ❖ Not always supported

# Survey of Fuels Treatment Specialists

- What does this mean for the user community?

- ❖ Users use what they know
- ❖ Use tools that are user-friendly, simple
- ❖ May not know that other tools exist
- ❖ Limited guidance on which to use
- ❖ A lot of time is spent “stringing” tools together for specific purposes
- ❖ A lot of time is spent acquiring and preparing data

**IFT-DSS must facilitate the most difficult and time consuming tasks to ensure success**



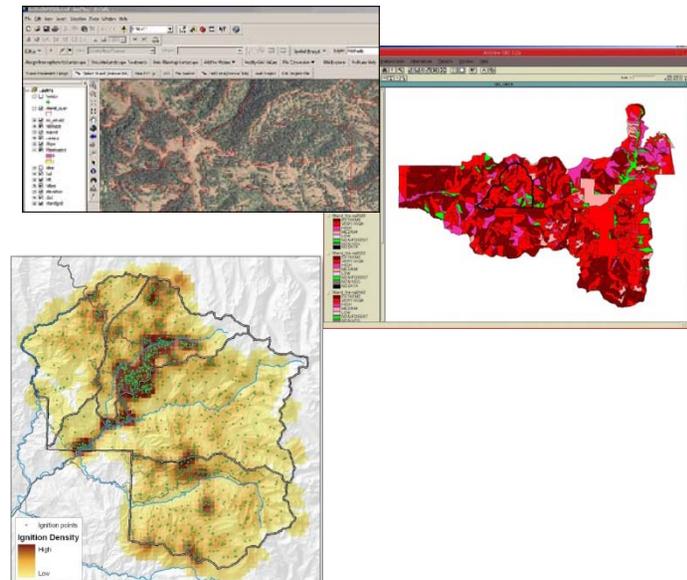
# Current State of the Fuels Treatment Community

- What about the existing comprehensive systems that “string” models together?

ArcFuels, INFORMS, LANDFIRE-IFP, StarFire, OptFuels = **VERY USEFUL SCIENCE**

- Some are agency specific
- Some require “expert” knowledge
- Do not address all fuels treatment use cases

User groups are small  
Do not facilitate collaboration with each other  
Not SOA frameworks designed for expansion  
User designed custom analyses not supported

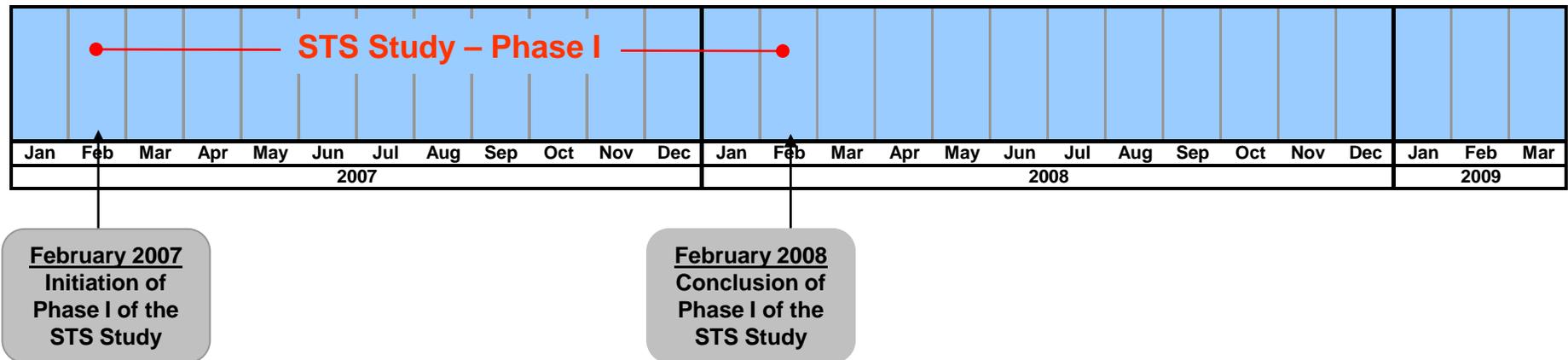


# Software Tools and Systems (STS) Study Strategic Assessment - Phase I

Software Engineering Institute  
performed strategic analysis of  
problem space

## Outcomes:

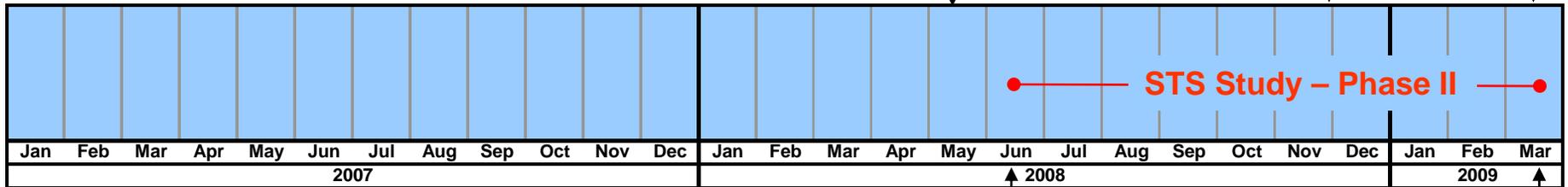
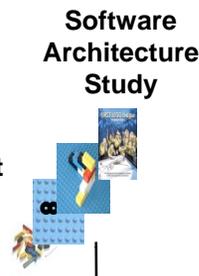
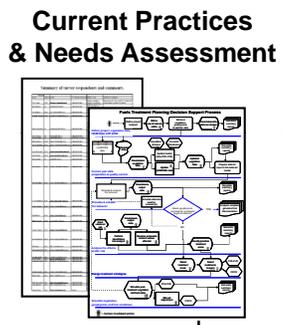
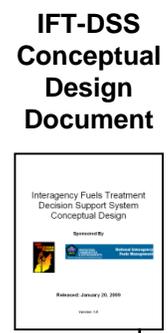
- Web-based SOA framework(s) needed
- BlueSky on right track
- Data not available to select “best” models
- Involve user, developer, governance, IT communities throughout
- Aligned with NWCG NWFEA
- Fuels planning focus for further exploration



# Interagency Fuels Treatment Decision Support System (IFT-DSS) Design - Phase II

Sonoma Technology, Inc.

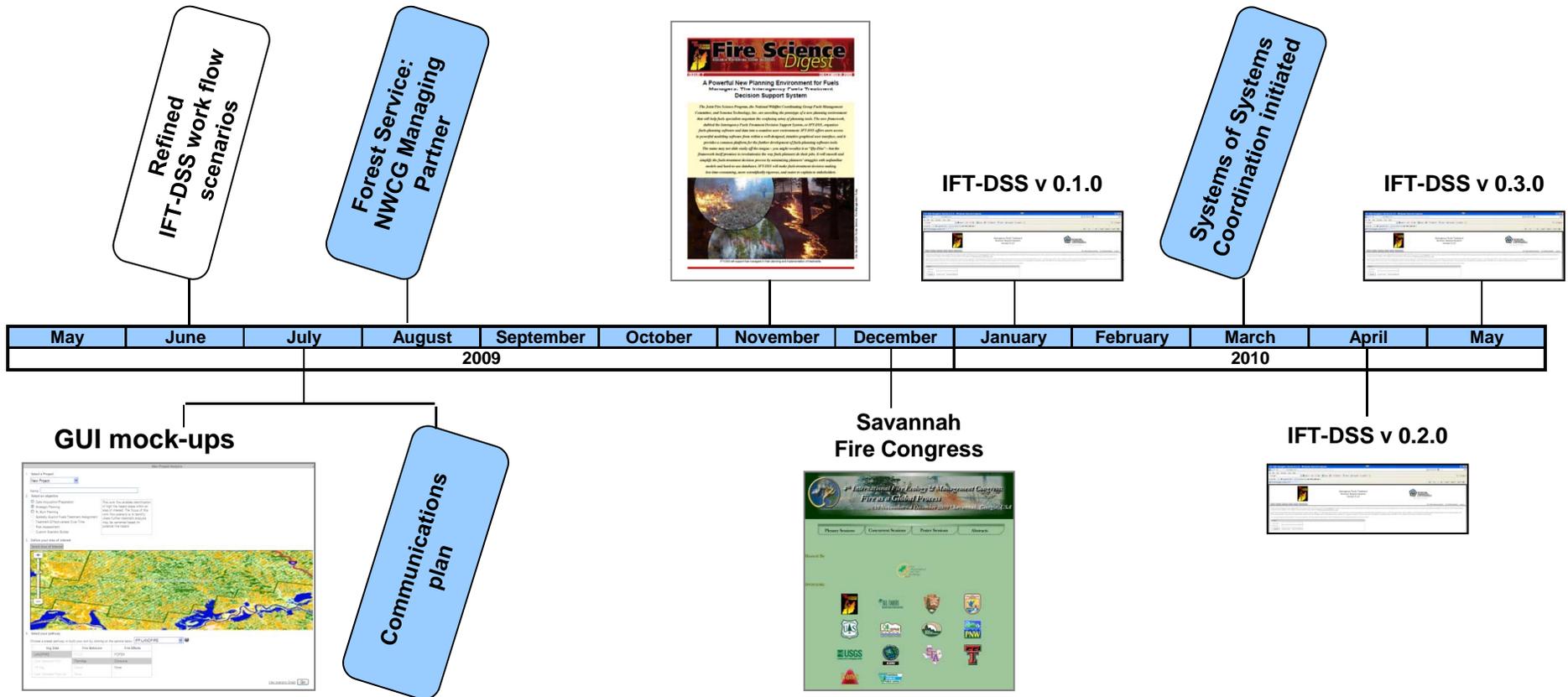
Interagency fuels team



**June 2008**  
Initiation of Phase II of the STS Study

**March 2009**  
Conclusion of Phase II of the STS Study

# IFT-DSS Proof of Concept Contract - Phase III



# Phase IV: System Development

## IFT-DSS v 0.4

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- Focus on transitioning proof-of-concept architecture to full system architecture
- Expand prescribed burn functionality
  - Expanded FlamMap capability
  - Inclusion of FOFEM
  - FCCS surface fire behavior
  - Variable wind analysis
  - Burn plan documentation support
- User feedback from IFTDSS version 0.3
- Strategic planning (spatial) functionality from version 0.3

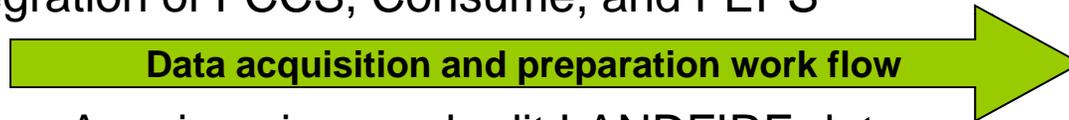
# Phase IV: System Development

## IFTDSS Version 1.0

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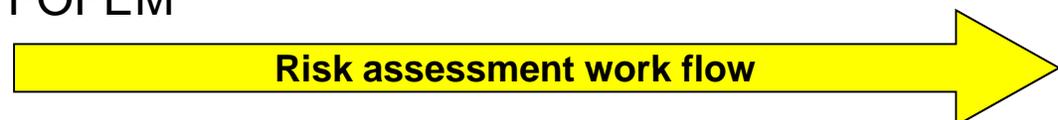
- Integration of FCCS, Consume, and FEPS



- Acquire, view, and edit LANDFIRE data
- Integration of NIFFT tool functionality
- FCCS fuelbed editor
- Ability to overlay GIS layers (i.e., values at risk, etc.)
- FireFamily+



- Integration of FlamMap MTT (fire spread and direction)
- Simulate fire effects with FOFEM



- Ability to input values at risk functions
- Assessment of current conditions

# Phase IV: System Development

## IFTDSS Version 2.0

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July 2011

June 2012

### Data acquisition and preparation work flow

- Acquire and edit treelist data; perform imputation; growth simulation (FVS)

### Strategic planning work flow

- Integration of FARSITE

### Spatially explicit fuels treatment assignment work flow

- Ability to identify project areas and treatment units
- Ability to assign treatments in space and time
- Ability to simulate treatment results

### Fuels treatment effectiveness over time work flow

- Ability to choose vegetation types and establish treatment types
- Ability to input fuel moistures and other weather variables
- Ability to simulate results over time using FVS-FFE

### Risk assessment work flow

- Ability to assign fuels treatments (simulation of vegetation needed)
- Ability to analyze the impact of treatments
- Ability to iterate treatment options until desired results are achieved

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# Work Flow Scenarios

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- Data acquisition and preparation
- ★ Strategic planning
- Spatially explicit fuels treatment assignment
- Fuels treatment over time
- ★ Prescribed burn planning
- Risk assessment
- User-defined (custom)



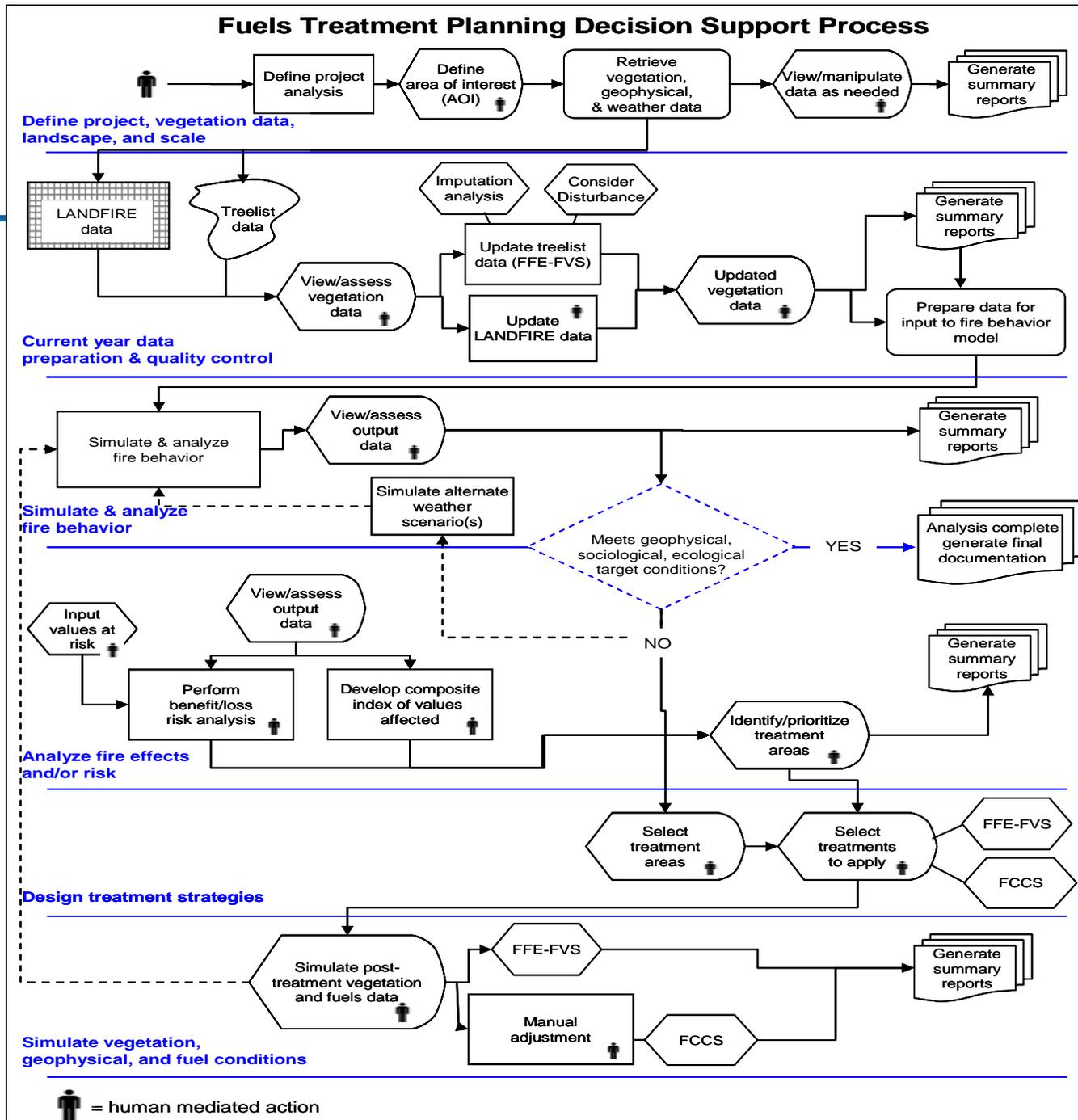
*Refined Work Flow Scenarios and Proposed Proof of Concept System Functionality for the IFT-DSS; Drury et al., 2009*  
(<http://frames.nbii.gov/ift-dss>)

# Analysis flow

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- 1) Define project, vegetation, scale**
- 2) Prepare and ensure quality of vegetation data**
- 3) Simulate and analyze fire behavior**
- 4) Analyze fire effects and/or fire risk**
- 5) Design treatment strategies**
- 6) Simulate treated vegetation as well as geophysical and fuel conditions**
- 7) Simulate treatment effectiveness in reducing fire behavior and fire effects potentials**



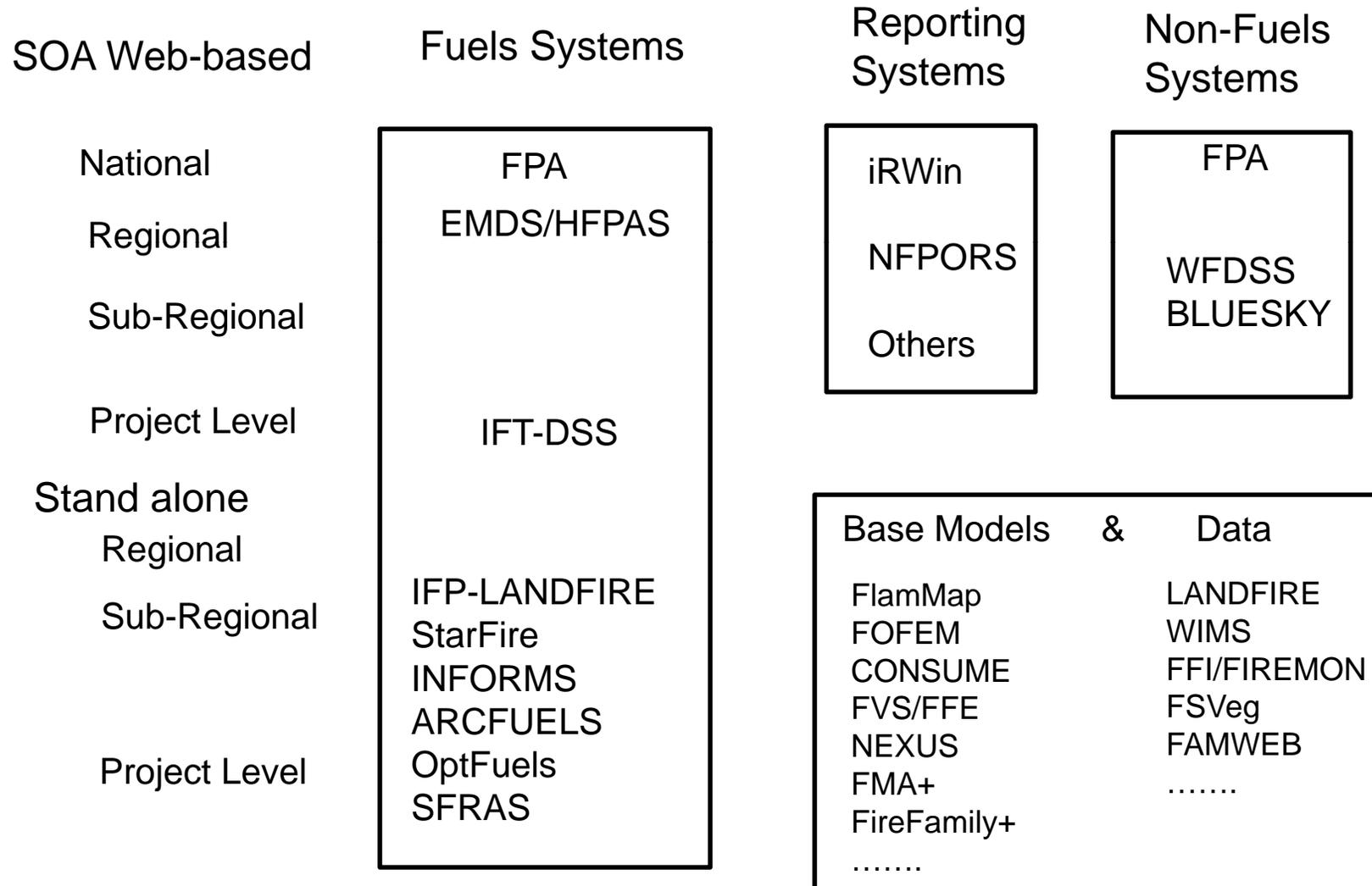


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# Many Systems - Little Interaction



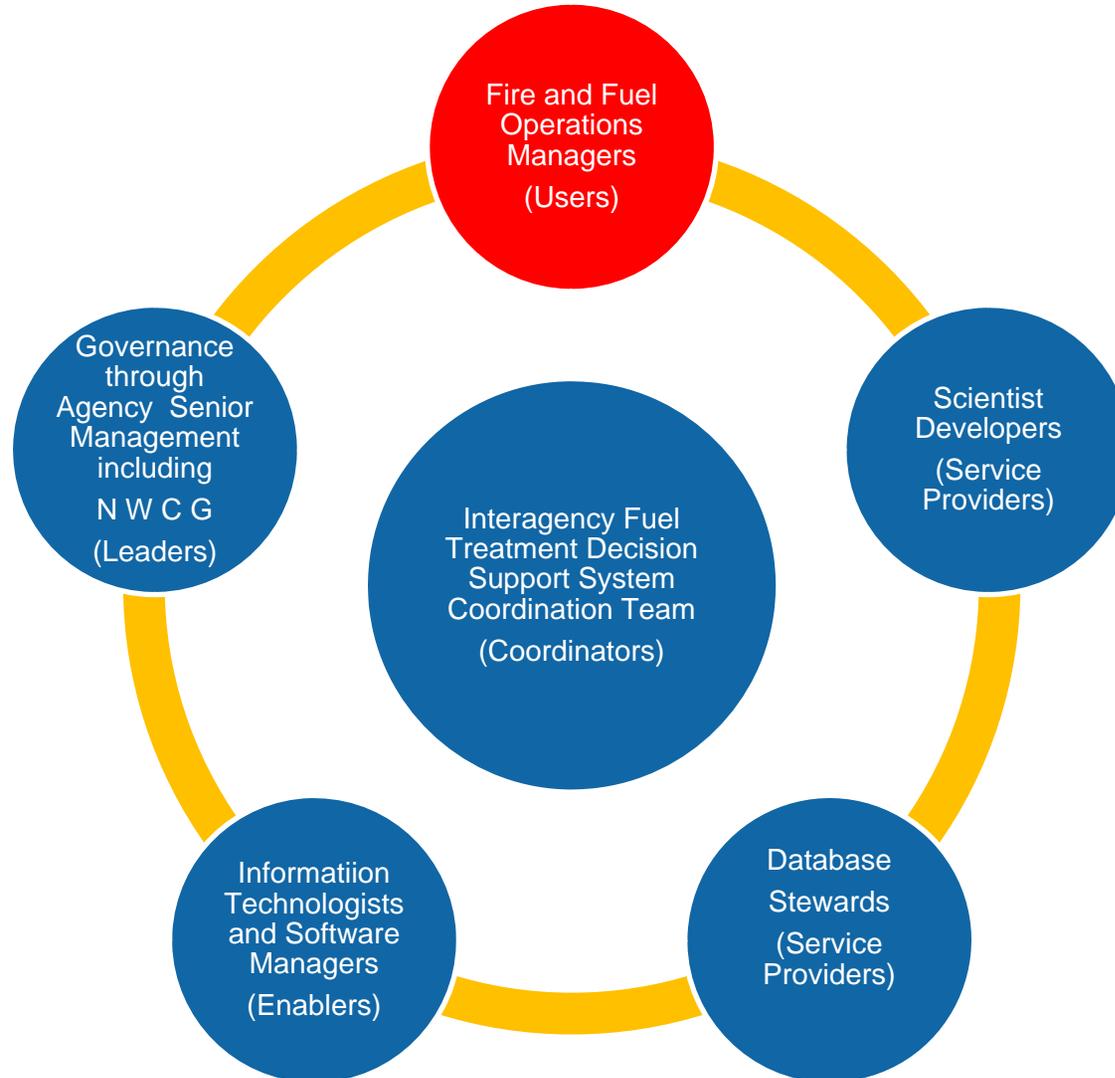
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# Success requires stakeholder cooperation

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# Every stakeholder group must have rewards, IFT-DSS can:

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- Advantages for Fire & Fuel Operations Managers
  - Universal access and version control through the Internet
  - Easy access to the necessary available data
  - Choice of software tools from a common interface
  - Easy setups for the most common analyses
  - Custom solutions for advanced users for unique situations
  - A single Graphical User Interface to master
- Advantages for Scientist Developers
  - Provides developers with software-software communications standards
  - Allows developers to improve functionality behind the scenes
  - Provides developers instant access to a large user community
  - Reduces the cost of developing and fielding software tools
  - Usage reports automatically sent to developers periodically

# Every stakeholder group must have rewards, IFT-DSS can:

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- Advantages for the IT/Software Managers
  - Ensures that security requirements are met
  - Ensures that agency IT policy has been followed
  - Databases of record are actually used
- Advantages for the Governance Community (NWCG+)
  - Organizes all fuels management software services into a single SOA system making supervision manageable
  - Enables informed management decisions on funding, expansion of functions, and prioritization of effort
  - Enhances ability to provide guidance on process and quality control
  - Increases agency operating capabilities by focusing scarce resources on high priority functions

# A communications strategy is crucial to a building a good stakeholder community

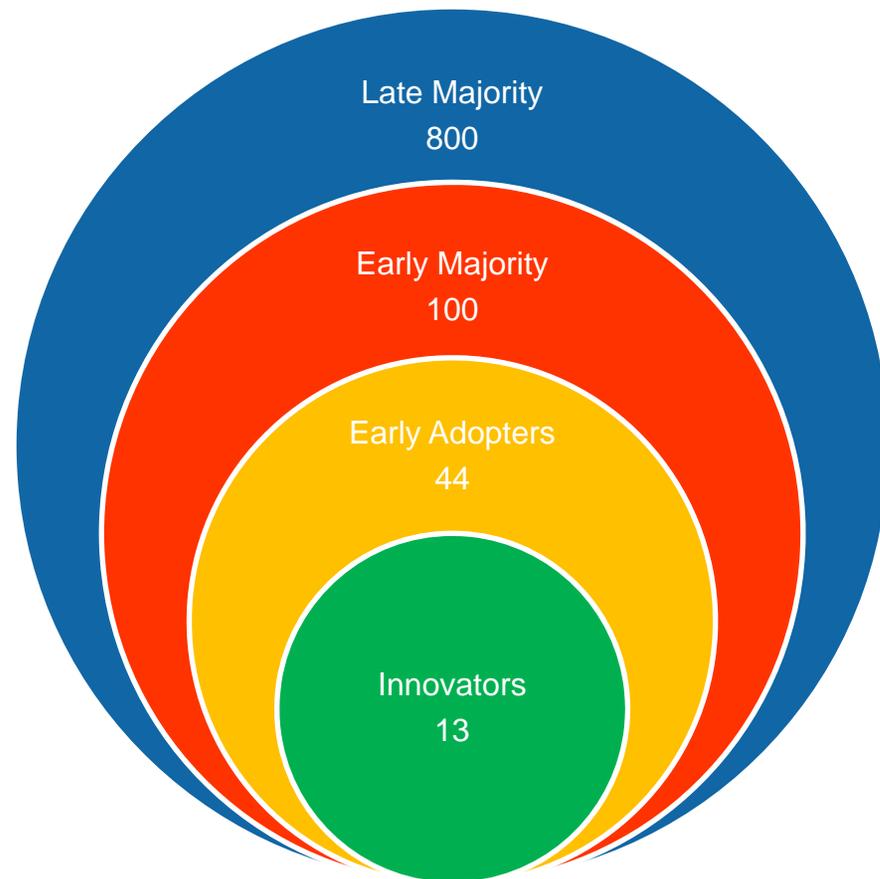
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Awareness

Understanding

Trial Use

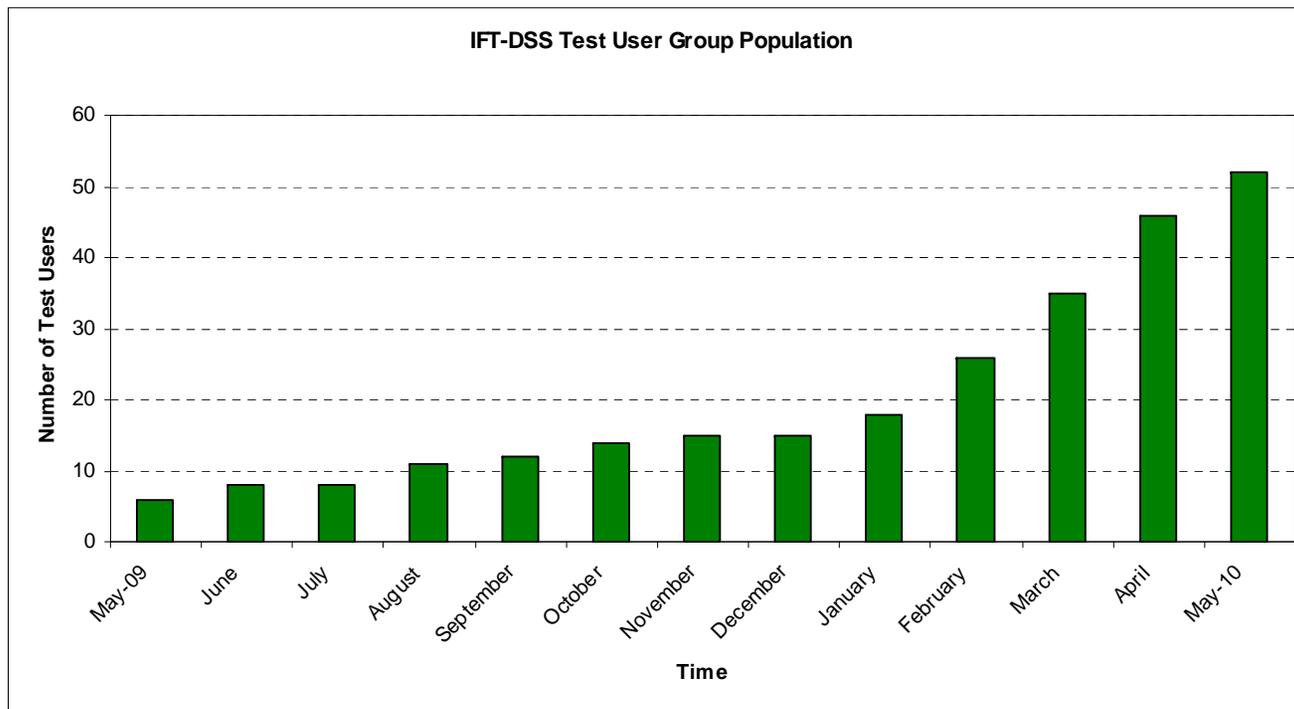
Adoption



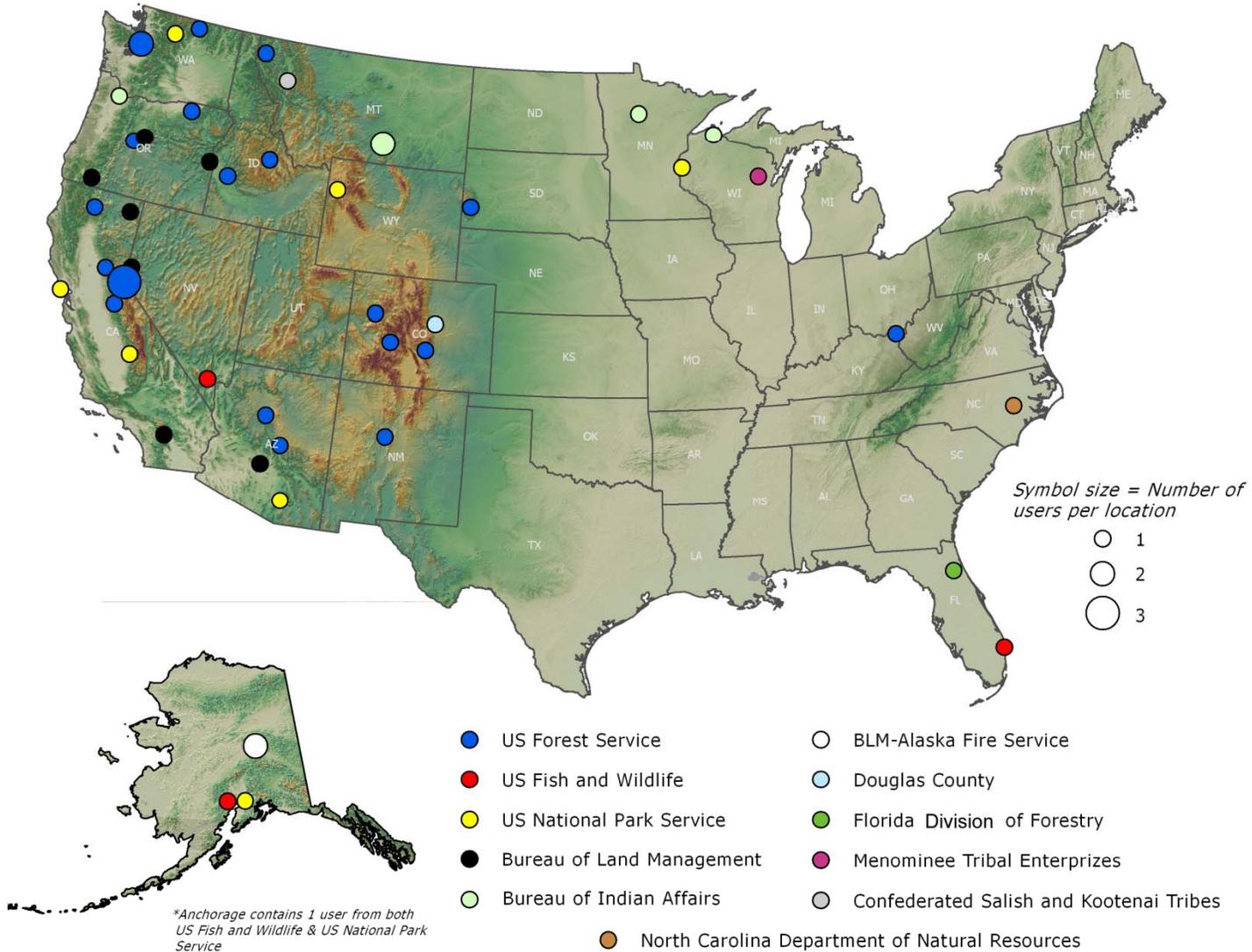
# Test User Group (1 of 2)

## Demographics

- Multi-agency representation
- Geographic representation



# Test User Group (2 of 2)

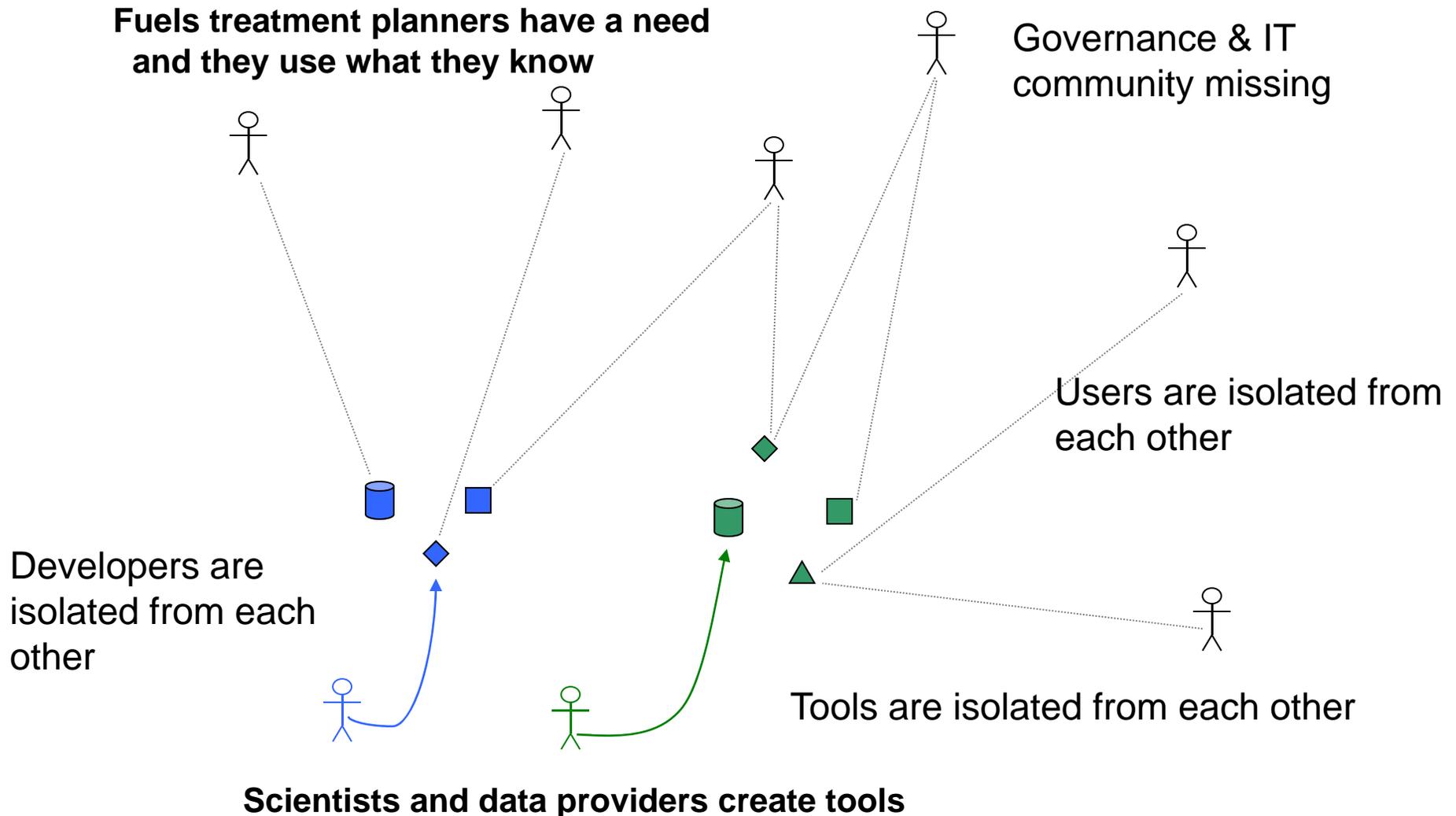


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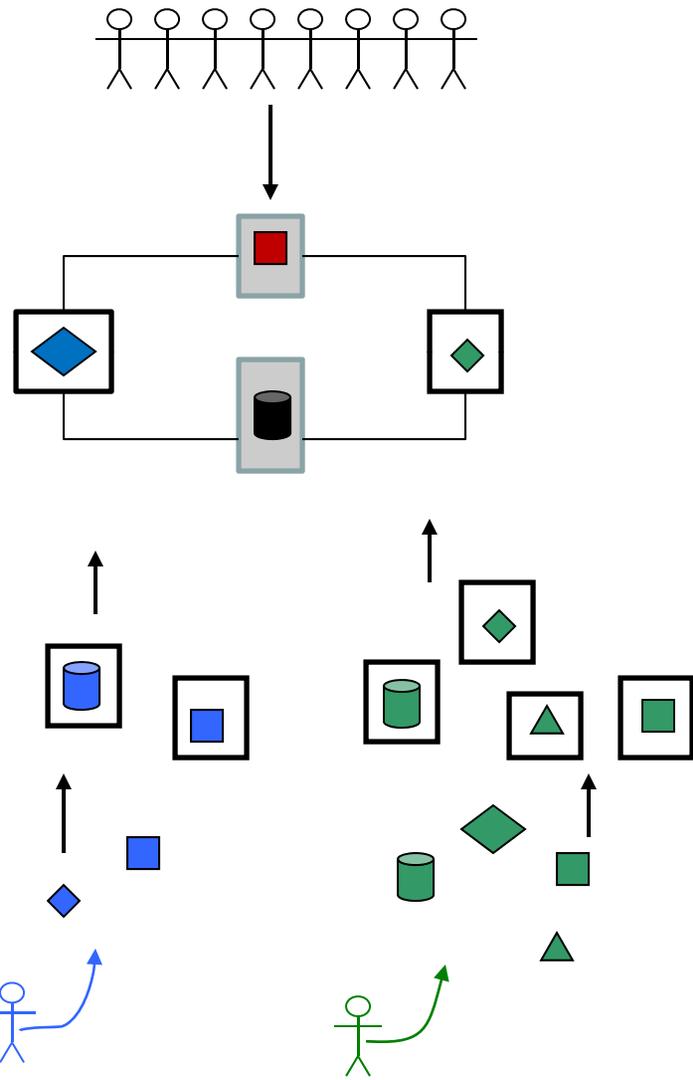
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# Current Condition: Fuels Treatment Community



# Vision for the Fuels Treatment Community

Information technology & governance



**IFT-DSS Framework Architecture:**

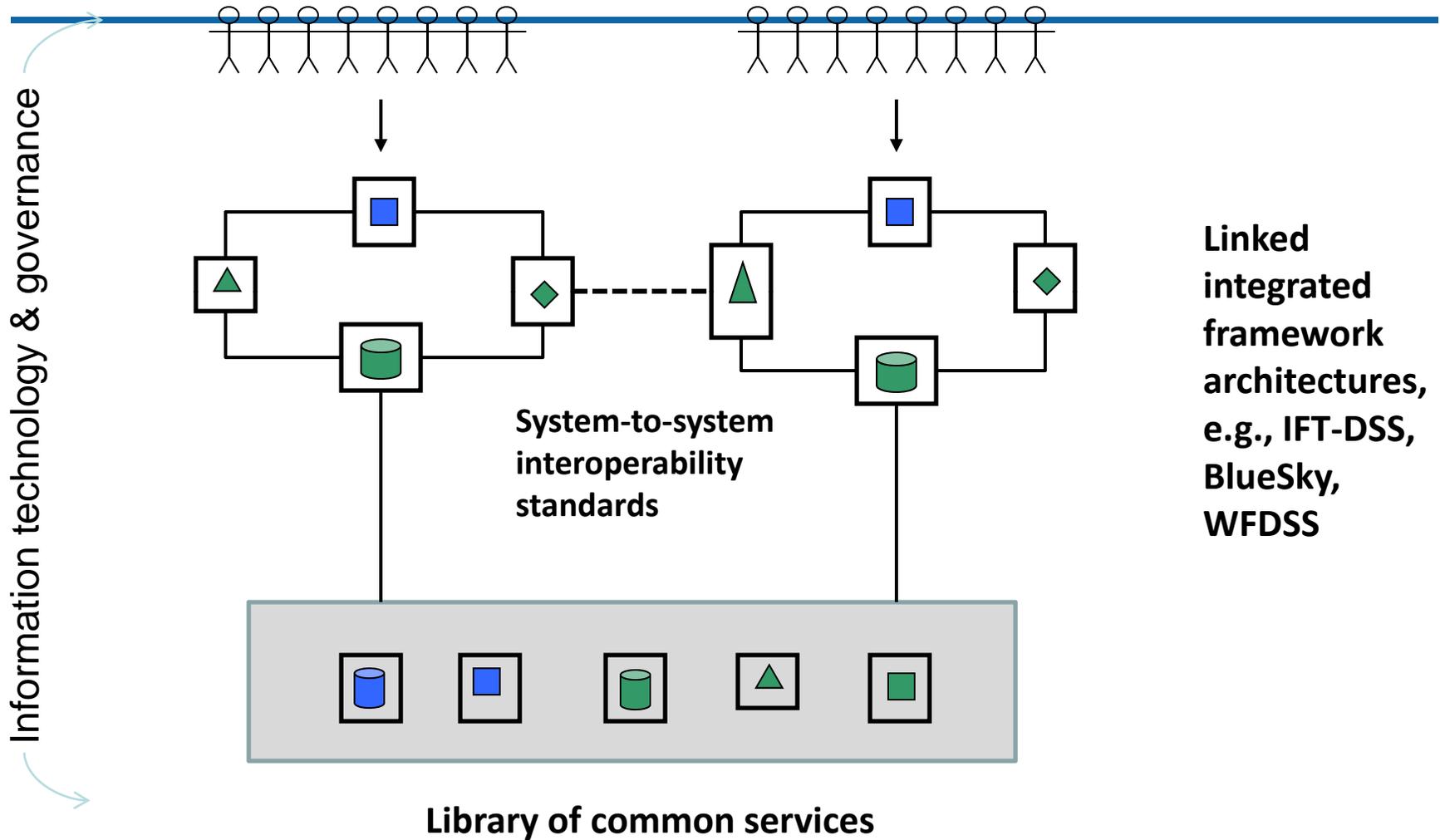
**Single interface, multiple tools, data transformations, web-based**

**New tools are coded as IFT-DSS services & linked with wrapped tools**

**Legacy tools are “wrapped” with a standard interface**

**Scientists and data providers create tools**

# Vision for the Fire and Fuels Community



# Help us develop IFT-DSS

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- Review the documentation published by the IFT-DSS project on the web:
  - <http://frames.nbii.gov/ift-dss>
- Contact: Mike Rauscher
  - Email: [mrauscher@bellsouth.net](mailto:mrauscher@bellsouth.net)

