Transitioning Subseasonal to Seasonal Research from the American Weather Enterprise to the NWS Operations

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Outline

- Joint Technology Transfer Initiative (JTTI) Background & Mission
- JTTI Implementation
- Current status of JTTI funded S2S projects
- Examples of JTTI S2S projects
- Summary

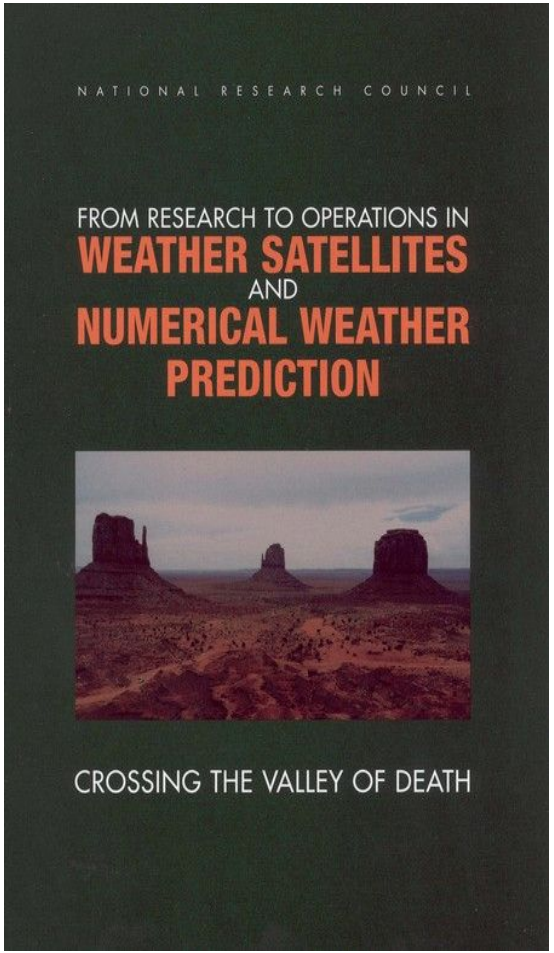
Joint Technology Transfer Initiative

Background:

- JTTI was created by the US Congress in FY16 with a $6M in NOAA/OAR's budget
- In 2017, JTTI became part of the "Weather Research and Forecasting Innovation Act of 2017"

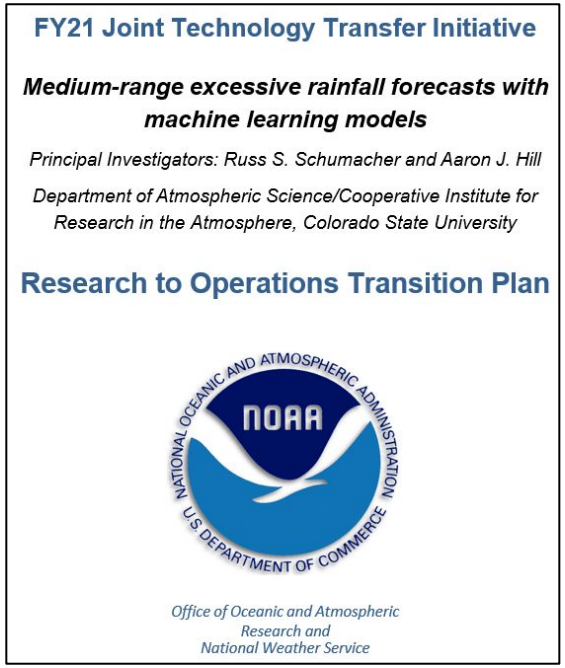
Mission: Continuous development and cost-effective *transition of the latest scientific and technological advances into the National Weather Service (NWS) operations, while working in* close coordination with the National Weather Service and in cooperation with the American Weather Enterprise

The charge is to "Cross the Valley of Death"



JTTI Implementation

- Guided by NAO-216-105B: Policy on Research and Development Transitions
  - In order to ensure research is transitioned to operations, NOAA signed the above Administrative Order
- A Research to Operations (R2O) transition plan is recommended for all funded projects above Readiness Level-4
  - ***JTTI made Transition Plan a requirement for all JTTI projects***



JTTI Implementation

Foster collaboration between the R&D entity and the operational entity early in the transition process

- *Identify a receiving office and collaborators from the NWS early in the proposal development stage*
- *Assign a NWS Point of Contact (POC) as soon as a project is funded*

Transition progress tracking

- *Use Readiness Levels*

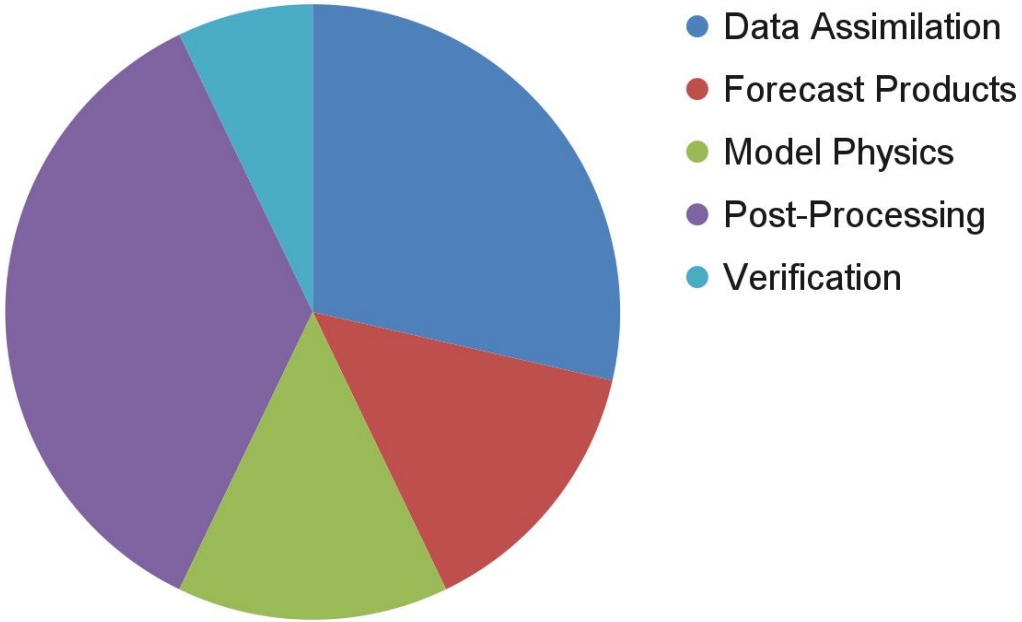
Mission Function	RL #	Definitions
Research	1	Basic principles have been observed and reported.
	2	Technology concept and/or application has been formulated.
	3	Analytical and experimental critical function and/or characteristic proof-of-concept.
Development	4	Component/subsystem validation in laboratory environment.
	5	System/subsystem validation in relevant environment.
Demonstration	6	System/subsystem model or prototyping demonstration in a relevant end-to-end environment.
	7	System prototyping demonstration in an operational environment.
	8	Actual system completed and "mission qualified" through test and demo in operational environment.
Deployment	9	Actual system "mission proven" through successful operations.

JTTI Emphasis

Current JTTI S2S Project Distribution

Total # of S2S projects = 14

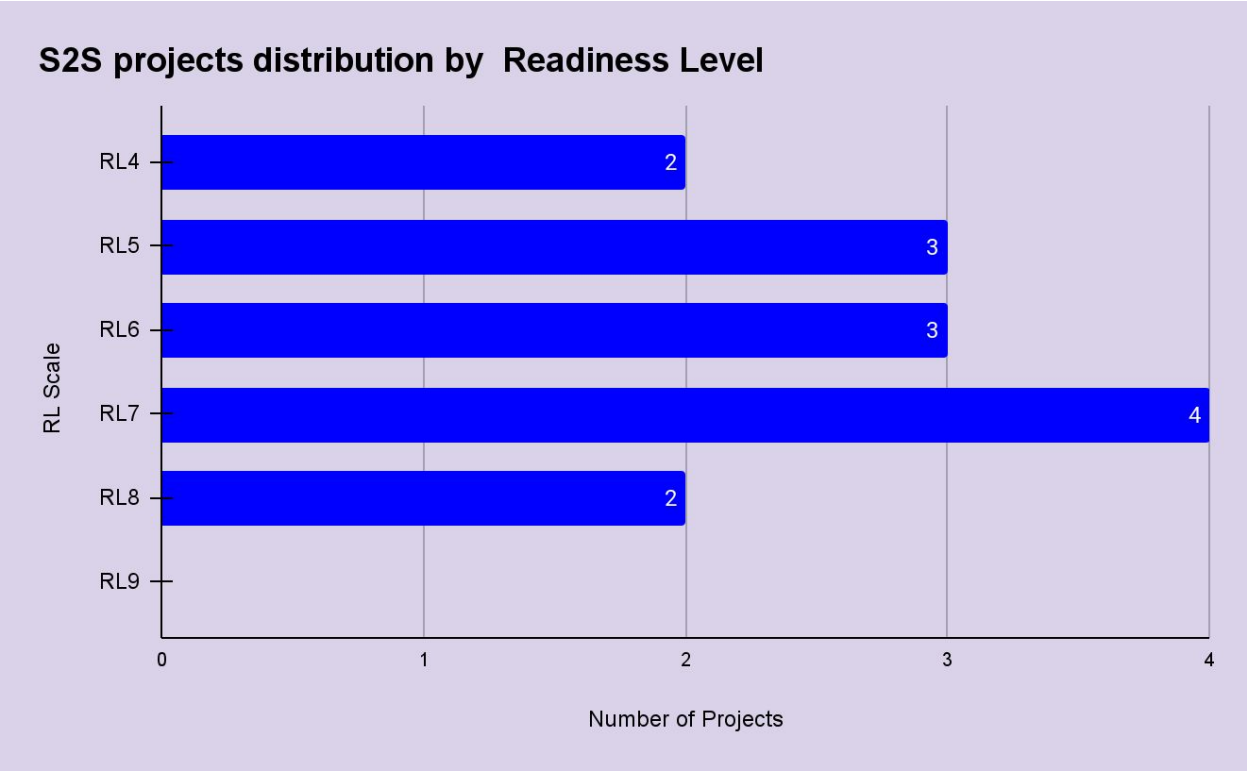
- **Data Assimilation = 4**
- **Forecast Products = 2**
- **Model Physics = 2**
- **Post-processing = 5**
- **Ver & Val = 1**



Out of 14 S2S JTTI projects, 4 projects use AI/ML techniques

Out of 14 S2S JTTI projects, two are ready to be transitioned to NWS/CPC operations

Current RL Status of S2S Projects



JTTI funded S2S projects are in development or demonstrationstage

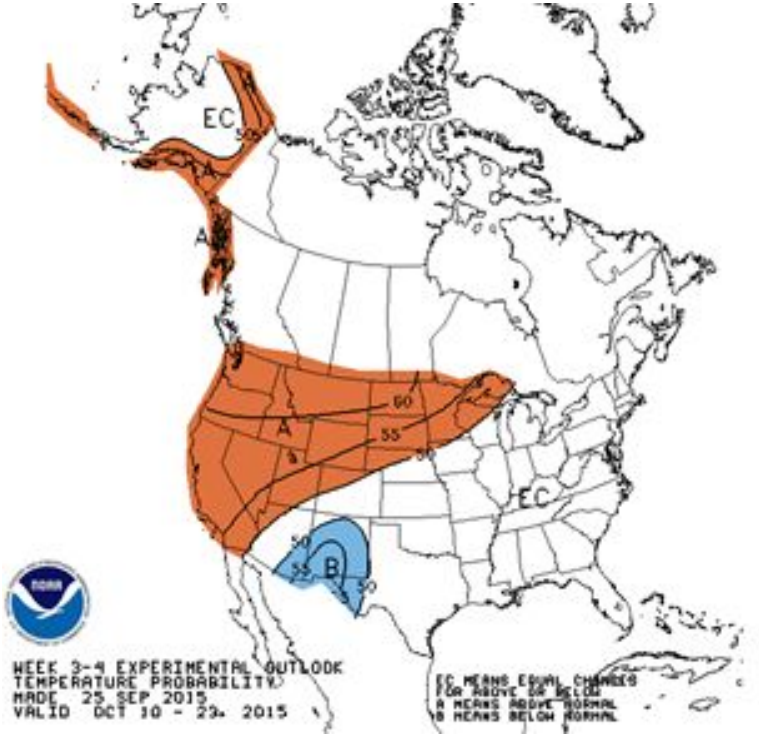
Examples of S2S projects

Project Title: Applications of METPLus to sub-seasonal climate outlooks, multi-model ensembles, proces studies, and extremes

PI: Tara Jensen, NCAR

Objective: To extend METPlus tools to evaluate CPC's operational temperature and precipitation outlooks at sub-seasonal time scales

Receiving Office: NWS/CPC (Ready to transition, currently running experimentally at CPC)



Examples of S2S Projects

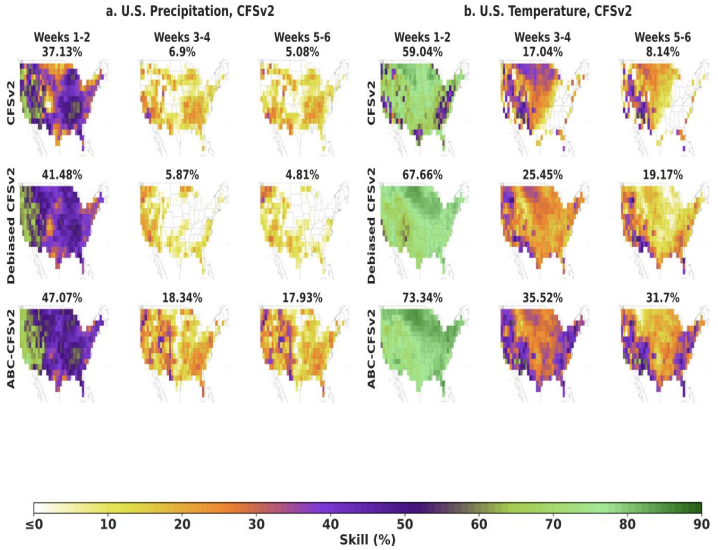
Project Title: Leveraging artificial intelligence to statistically postprocess GEFS ensemble forecasts for week 3-4 outlooks of precipitation probabilities for the CPC

PI: Rochelle Worsnop, PSL, OAR, NOAA

Objective: To improve the forecast skill of CPC's operational week 3-4 precipitation outlooks

Technique: Bias correction of GEFS by leveraging AI/ML techniques

Receiving Office: NWS/CPC

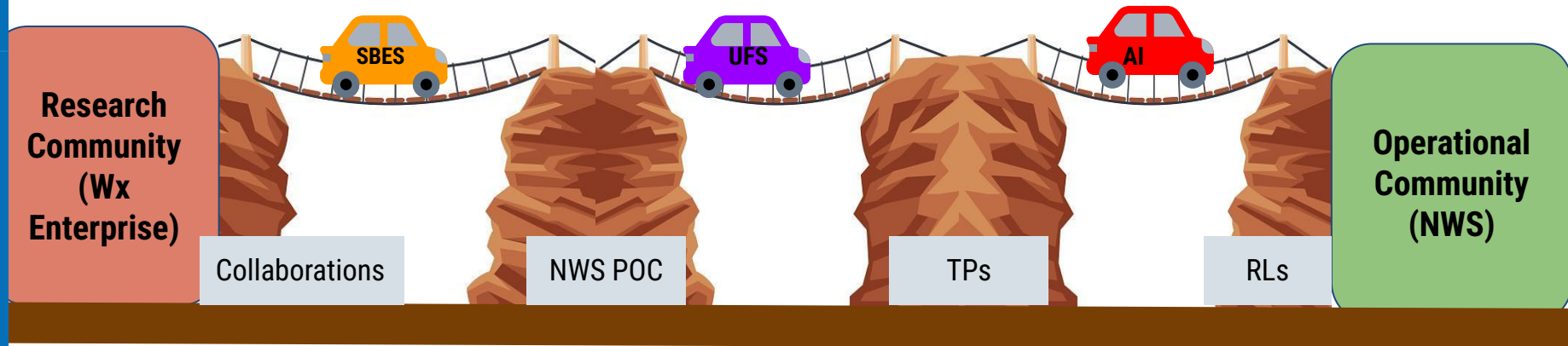


Summary

JTTI built a "bridge" to transition S2S research from the American Weather Enterprise to the NWS operations, based on four foundational pillars:

- Fostering early collaborations
- Assigning a NWS Transition POC for transition projects
- Developing end-to-end transition plans (TPs)
- Using readiness levels (RLs) to track the transition progress

To date, JTTI funded 14 S2S R2O projects and two project ready to be transitioned (RL=8) to the NWS/CPC operations

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