

Phased Array Radar Innovative Sensing Experiment 2013

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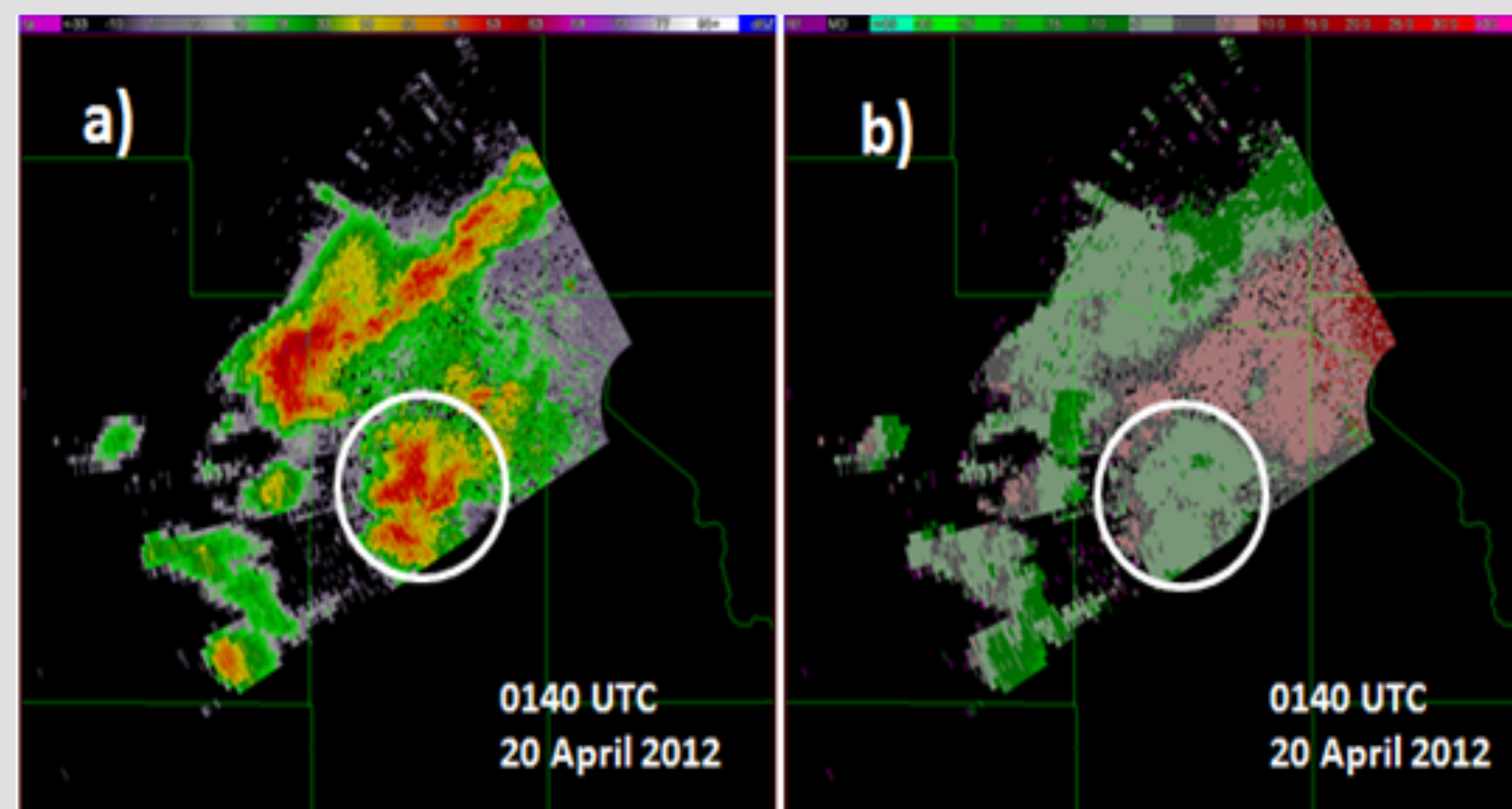
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PARISE 2013

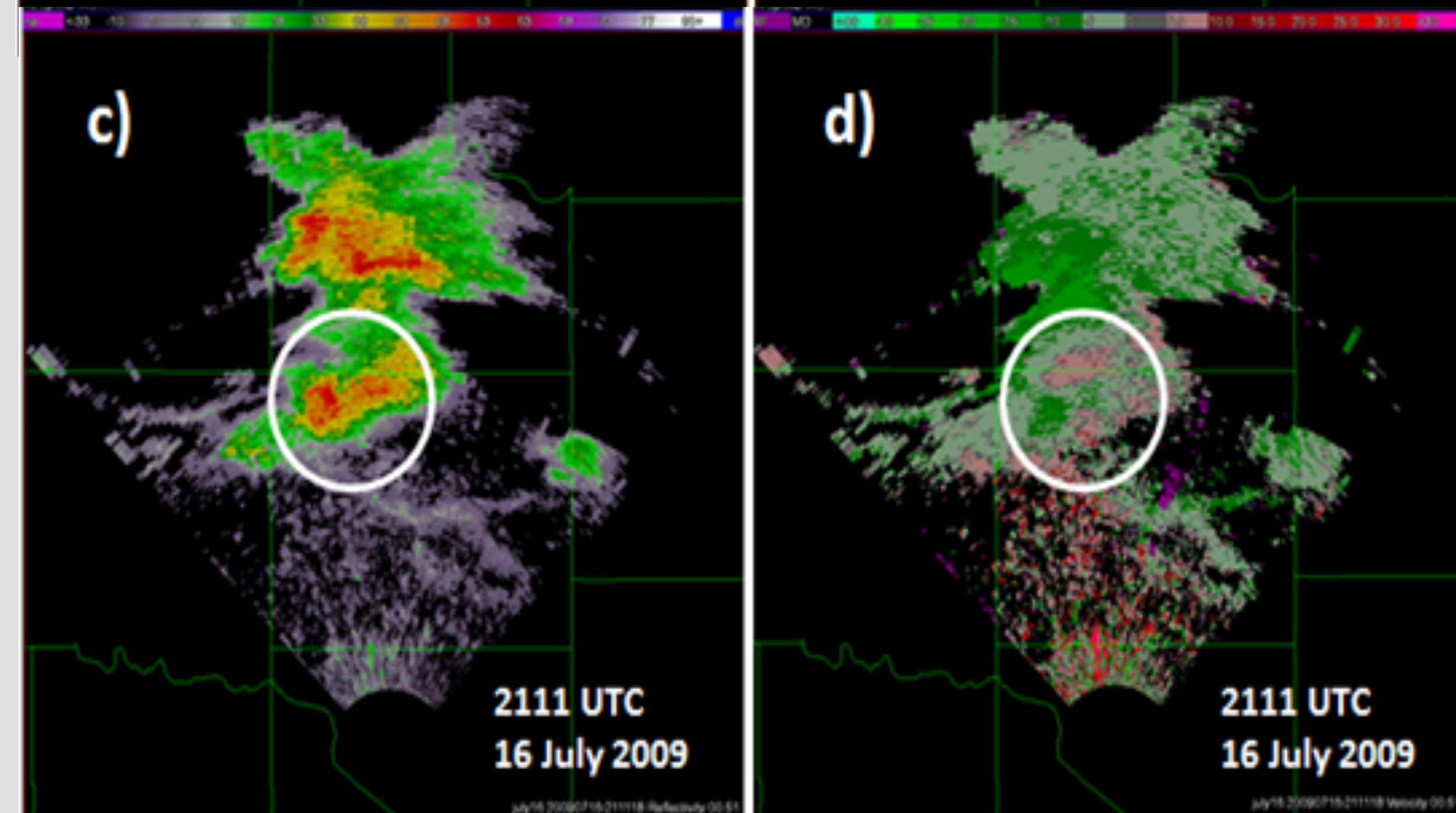
How will 1-min PAR updates impact NWS forecasters' warning decision processes during severe hail and wind events?

- 12 NWS forecasters
- Control (5-min updates) and experimental (1-min updates) groups

Case 1:
Marginally severe hail event



Case 2:
Severe hail and wind event

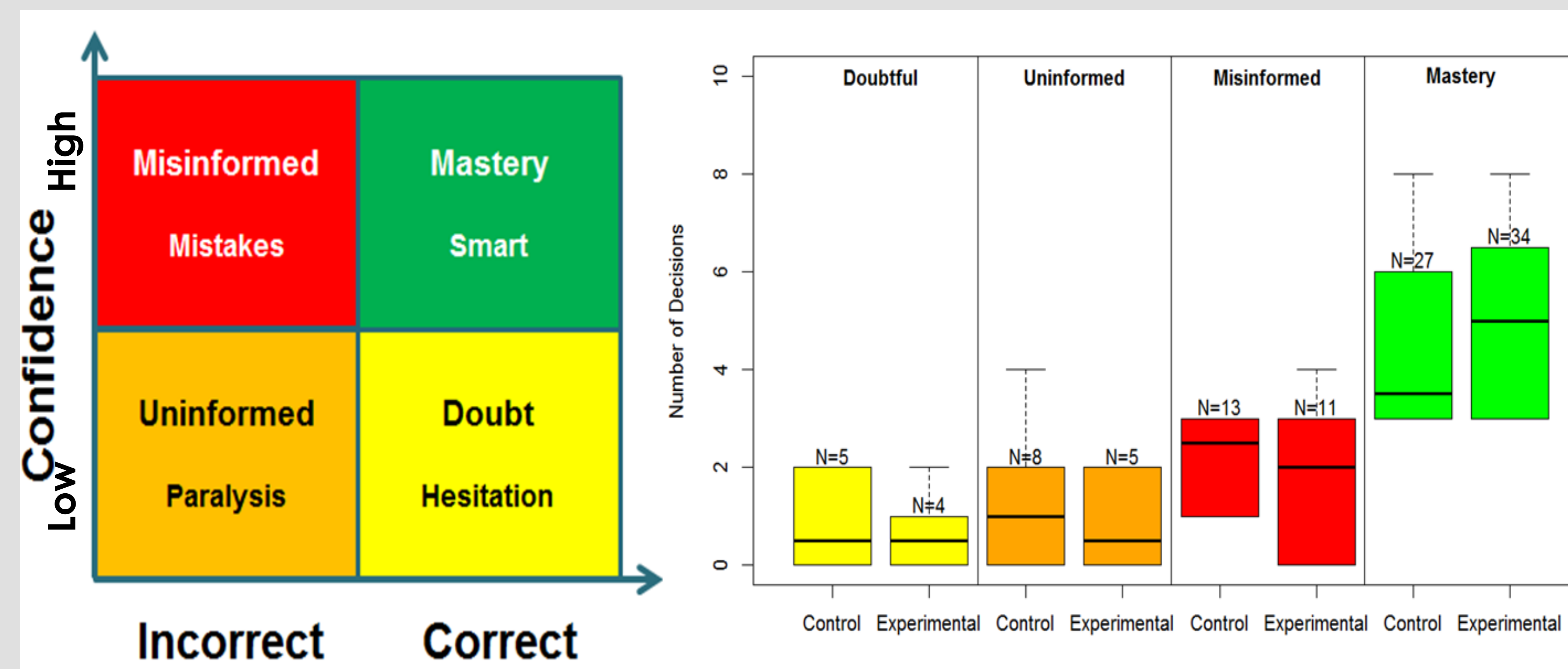


Results

Warning Lead Time

Cases 1 and 2 combined	Median lead time
Control	17.3 min
Experimental	21.5 min
Difference	4.2 min (Statistically significant, $p=0.0252$)

Decision Types



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Example: Tornado Warning Decision

2 x 5-min PAR updates

Control-Uninformed

2053 Kidney bean shape, strong midlevel mesocyclone.

2058 Circulation tightening and deepening, anticipate mesocyclone will stretch down to surface. **Don't wait until gate-to-gate at 0.5 ° because would be too late.**

Issue Tornado Warning

10 x 1-min PAR updates

Experimental-Mastery

2053 Broad rotation at higher levels... Going back a couple of frames can see it has strengthened aloft... Too high to issue on but something to watch. Still noticing broad rotation further aloft but nothing yet developing at the surface that would indicate any kind of tornadic issues.

2058 Some rotation with new data at 8 kft. **Getting closer to the surface.** Slight rotation at 0.5° ... **Mock up a tornado warning.** Will wait for new data to come in... Whatever was there at the surface has sort of fallen apart and it's a little too far south of the hook so still going to wait. Not seeing any tight velocity gradient near the surface. **Rotation aloft has diminished and still no sign of rotation at 0.5°.** Tornado warning not needed.

Correctly Reject Tornado Warning

Summary

- Experimental participants obtained a **significantly longer median warning lead time** than control participants
- Experimental participants made **more mastery** (i.e., confident and correct) **decisions** than control participants
- Information perceived via 1-min PAR updates had a **substantial impact on the warning decision process**

