

Problem

Throughout the Western United States, mega-wildfires are becoming the norm. The current approach to mitigation is not adequately addressing this national challenge. Retardant tankers are based on old technology and techniques making retardant delivery less efficient. Low-altitude detection and mitigation flights over wildfires presents significant safety challenges.

Solution

By using Expandable Variable Autonomy Architecture (EVAA) technology coupled with advanced sensing capabilities, NASA can create a precision strike retardant application solution that incorporates improved Ground Collision Avoidance System (iGCAS) functionality. Leveraging highly successful and life-saving Auto-GCAS technology, would allow for safe manned and unmanned flights at very low levels during both daylight and nighttime wildfire detection and mitigation operations.

Benefits

This would dramatically improve the ability to precisely and optimally deliver retardants through an air-network of manned and unmanned aircraft. Improved GCAS would enhance the safety of flight at very low levels for wildfire detection and mitigation efforts.

Test Approach

Identify previous challenging fires for aerial drops

- Use simulation to evaluate collision avoidance performance in the same areas
- Fly nuisance evaluations and demonstration at the same conditions and runs in those same areas.

Precision Strike Air-Network Technologies and Techniques

- Precision application using automated curvilinear delivery techniques
- Optimized design for rapid sortie cycle
- iGCAS capabilities installed on all aircraft
- Persistent ISR and dedicated communications
- Centralized command and control
- Wind sensing technologies
- Propagation prediction algorithms

