REACHR
## RECONNAISSANCE AND EMERGENCY AIRCRAFT FOR CRITICAL HURRICANE RELIEF

MULTI-MODE UAV
- Vertical Take Off and Landing (VTOL) mode eliminates the need for a runway
- Unmanned Surface Vehicle (USV) technology for water landing and surface operations
- Conventional flight mode for long-range and high-endurance missions
- Transition mode for switching from vertical flight to cruise flight
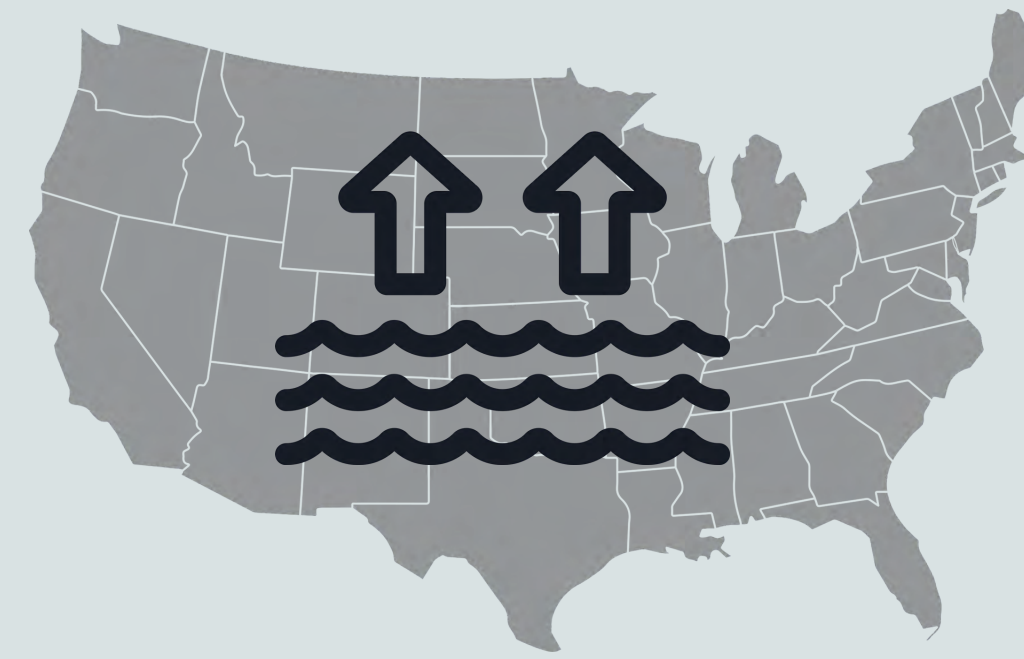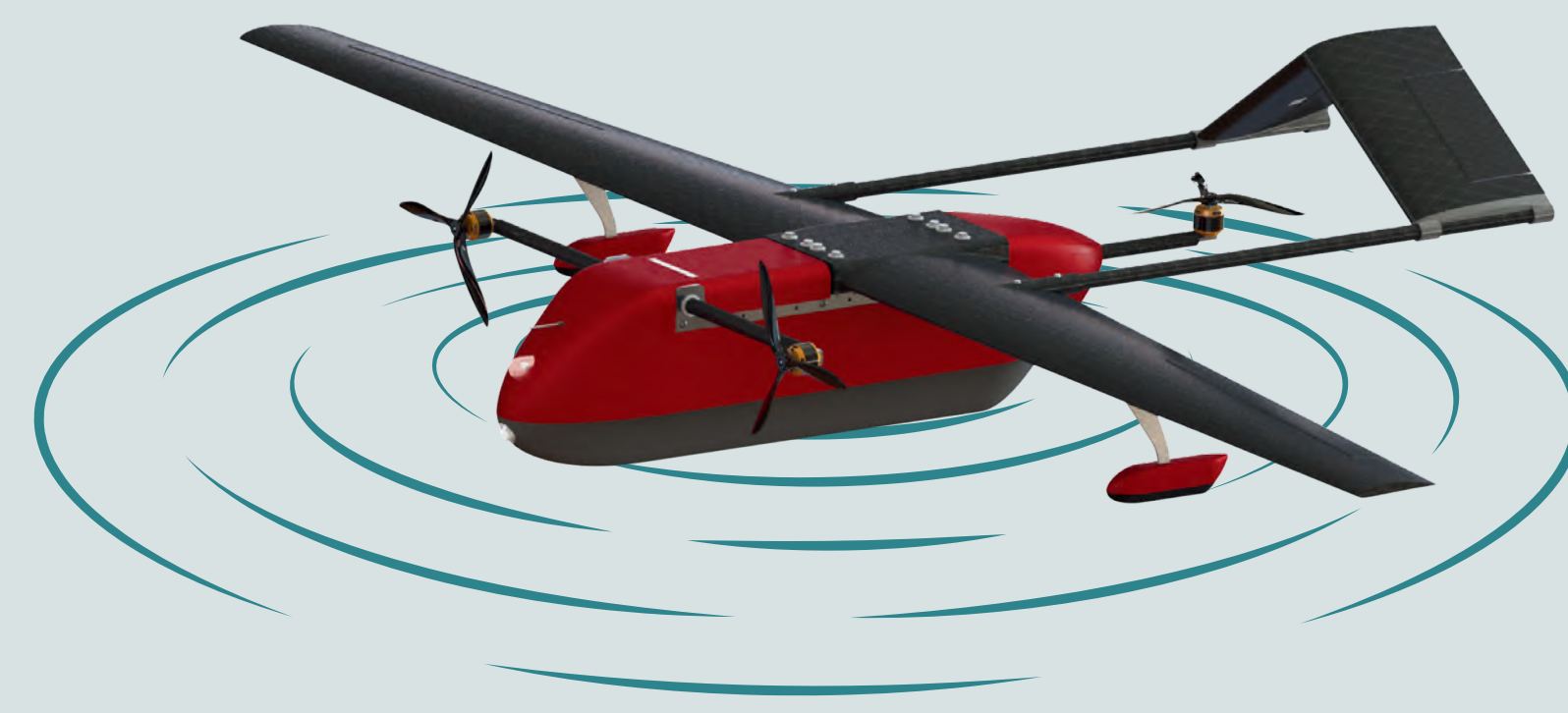
300 Floods per year in the US, affecting **Millions**

AI ROUTE PLANNING
- Deploys sensor systems to gather data about affected area
- Equipped with advanced avionics, surveillance tools, object recognition, and GPS tracking
- AI software processes sensor data for rapid rescue plan, analyzing information to assess victims and conditions
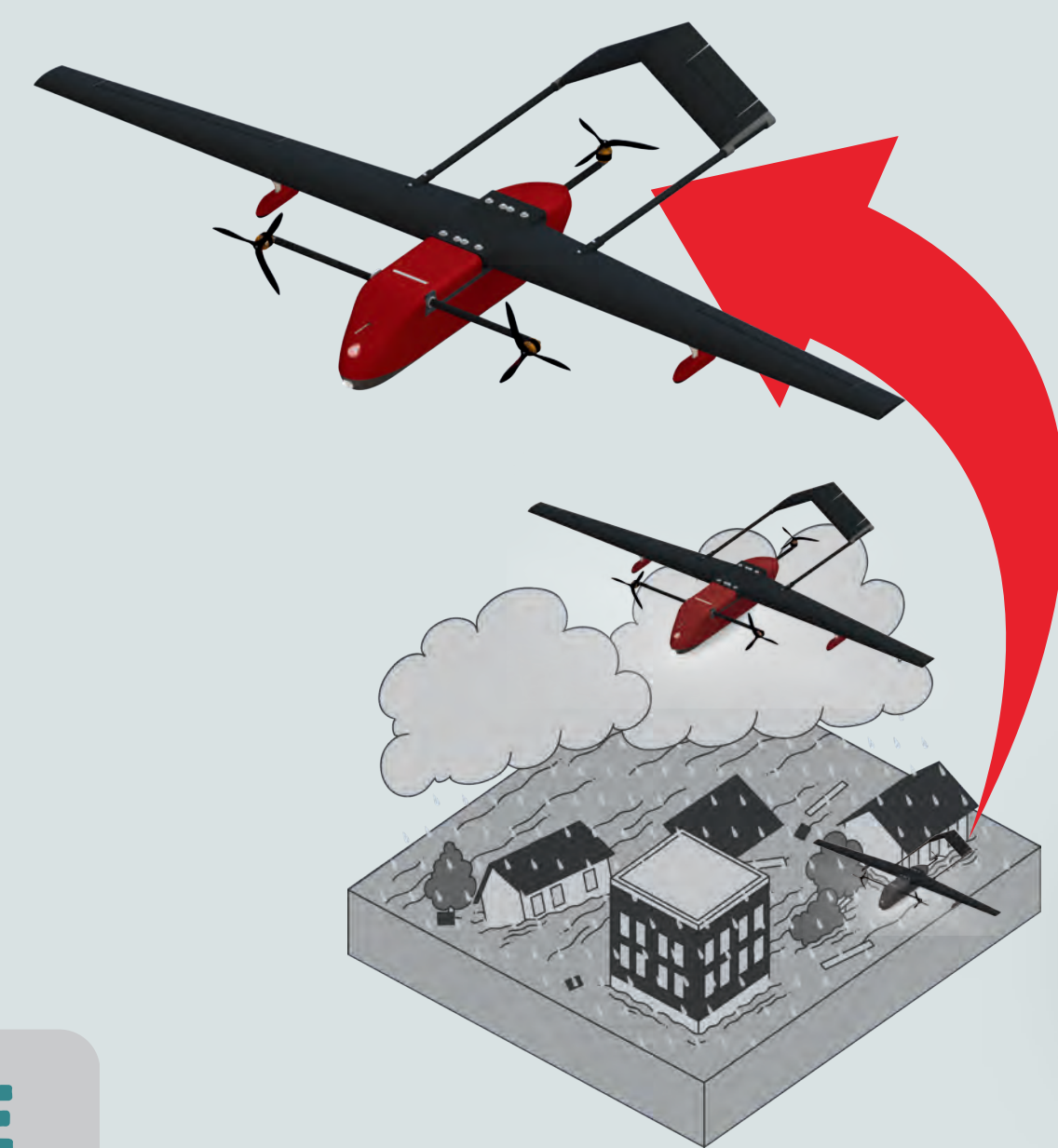
FIRST RESPONDER SAFETY
- Enhances safety for first responders by decreasing physical presence in hazardous zones
- Reduces the need for manned aircraft in high-risk or hard-to-reach areas

FINDER system detects heartbeats beneath debris or within structures
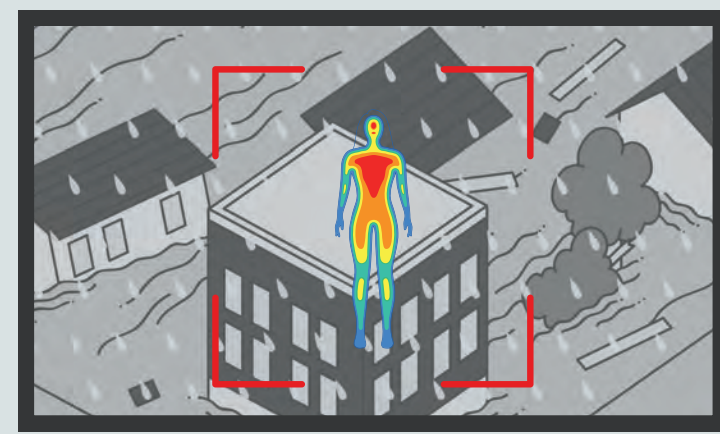
LiDAR precisely maps the terrain and identifies potential hazards

ENHANCED SEARCH AND RESCUE
- Detects heartbeat and breaths under debris or in buildings to locate survivors
- Provides rapid data analysis for developing effective rescue plans
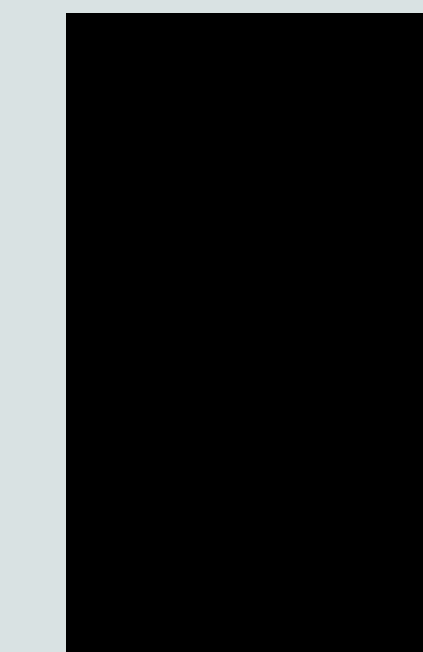- Enables route planning to avoid hazards, increasing safety and efficiency
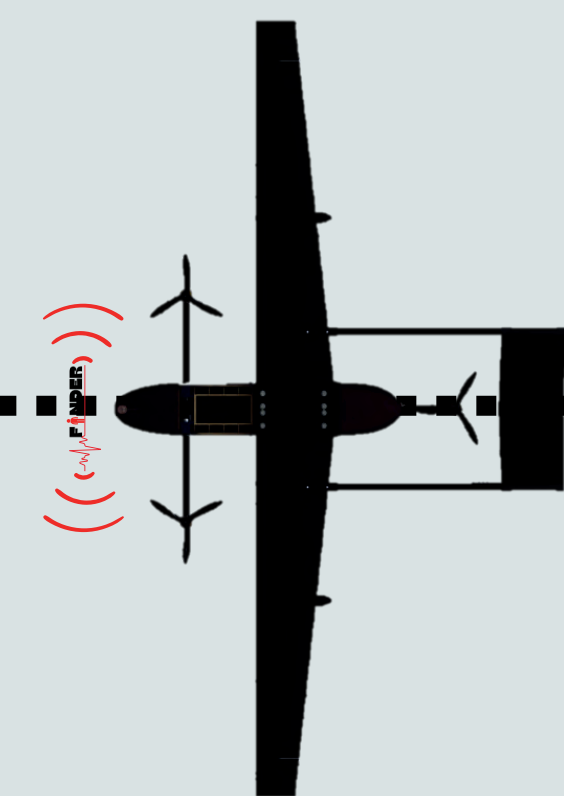
MOBILE RELAY TECHNOLOGY
- Mobile relay provides extended communication range in remote or disaster-stricken areas
- Helps maintain communication with ground crews and rescue teams in challenging terrains
- Ensures reliable and uninterrupted data transmission for critical updates and coordination

Operational Cost
$500,000 — Current Systems
$100,000 — REACHR

Solar Charging
Battery Powered
Aerodynamically Efficient

INTEGRATED WEB SERVICES
- Integrated web service facilitates real-time coordination among rescue teams
- Allows for centralized communication and data sharing
- Enables quick dissemination of critical information to relevant parties

2024 Preliminary Design
2025 Critical Design
2026 Prototyping and Testing
2027 AI Development
2028 System Integration
2029 Web Application Development
2030 Manufacturing/FAA Approval
2035 Deployment

NC STATE UNIVERSITY
Mechanical and Aerospace Engineering