

Regional Scale Rain Making

A new tool to combat
global warming or
Drought Reduction as a Means
of Carbon Sequestration

By Mike Fallwell

Mission:

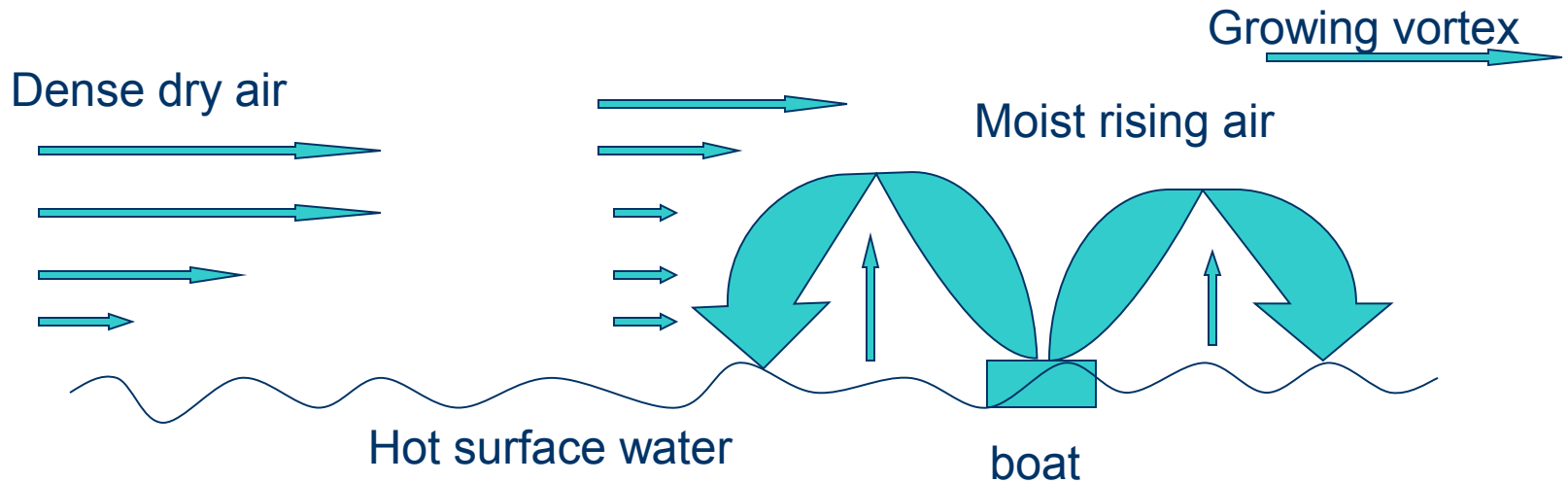
- To sequester atmospheric carbon by bringing moisture and fertility to arid regions of the world
- By triggering an avalanche in a natural nonlinear system

How:

- Dr. Steven Salter of the University of Edinburgh and others, have identified a marine boundary layer that prevents rapid evaporation of hot surface water, which covers a very large area of ocean.
- If this boundary layer is a bottleneck in the normal development of marine rain storms, it may be that it can be manipulated to increase the size of developing storms.
- Our goal is to break up this boundary layer by spraying water into the air approximately 60 feet using vessels with large pumps to add heat and moisture to air above the boundary layer in the path of a storm.
- This will initiate a convective cycle that will form a growing vortex trailing the boat.

Boundary Layer Disruption

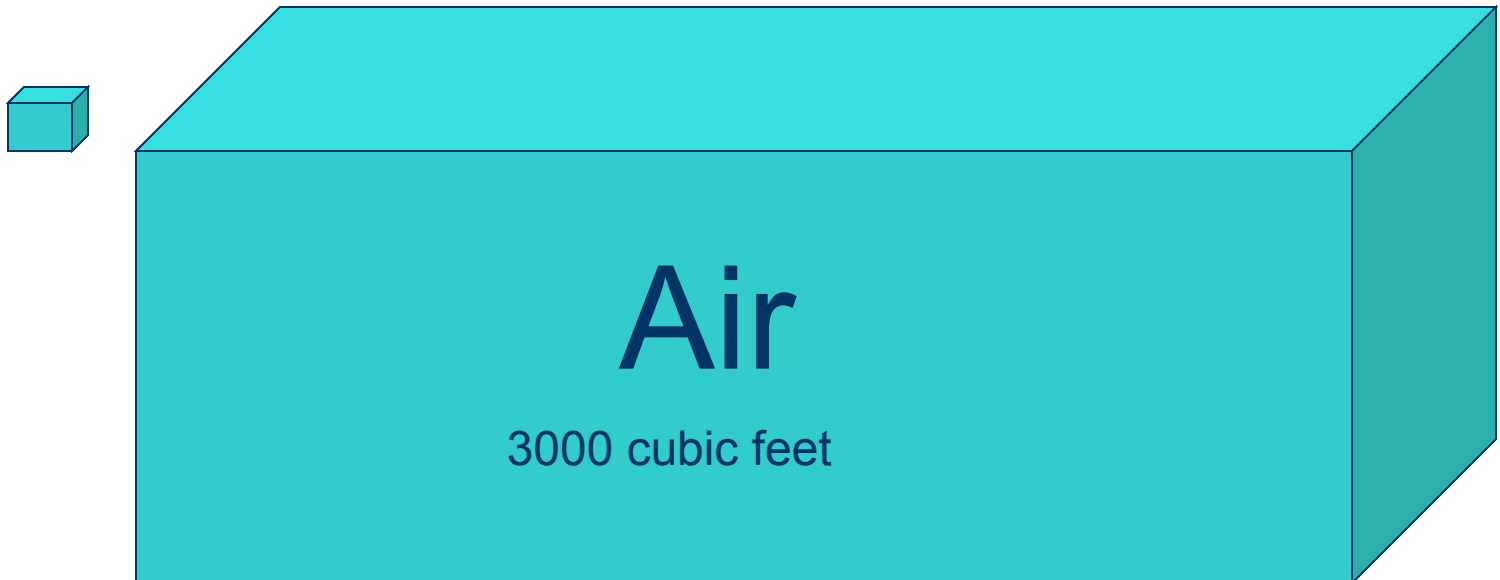
B L isolates surface air from mixing



Rising air trips the boundary layer causing turbulence and convection

Energy stored by surface water

- One cubic foot of water stores more heat, than three thousand feet of air.
Months of accumulated solar energy create the potential for avalanche



Vortex Development

- Vertical air currents expose dry air to hot water causing evaporation
- Then as the humid air mass grows so does wind velocity and rate of evaporation.
- Moist air will rise to about 10,000 ft displacing dry heavy air.
- The convection vortex can grow to over a mile.

Ideal avalanche conditions

- A large difference in air and water temperature
- Moderate wind speeds (4-8 mph) to maintain a boundary layer
- A developing storm with an appropriate track
- In nature these conditions can, over a few weeks, evolve into a hurricane.

Enhanced yields

- A large dense weather system, like the monsoon, will give a more efficient extraction of water from the air mass than a smaller storm.
- So a small increase in the strength of a storm, can give a disproportionate increase in its water yield.

Active air masses

- At 50% humidity 1% of the air mass is water vapor.
- 1 cubic mile of this air has a mass of 5,000,000 tons and contains 50,000 tons of water.
- Each boat will release 400 cubic miles of humid air each day or 20,000,000 tons of water.

Biomass

- If 10% of rain becomes biomass and
- 10% of biomass becomes soil and
- 10% of soil becomes carbonate it will take a ton of water to remove 2 pounds of carbon permanently from the atmosphere.
- With a bonus 200 pounds of biomass

Financial Model:

- Carbon credits will be sold based on the amount of biomass produced, as measured by satellite imaging.
- Each boat can permanently remove 20,000 tons of carbon a day from the air.
- Over \$100,000 of carbon offsets

Research and Development:

- Computer models will be used to establish initial feasibility and to plan tactics for vessel deployment.
- Microwave sensors on widely spaced buoys can be used to map boundary layer conditions, by using the high index of refraction of humid air as a waveguide. This will provide feedback to fine-tune the process.