



# Vapor Compression Desalination

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AICHE Projects Prototype Showcase



# Team Members

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- Team Lead:

Corey Shono

- Subleads:

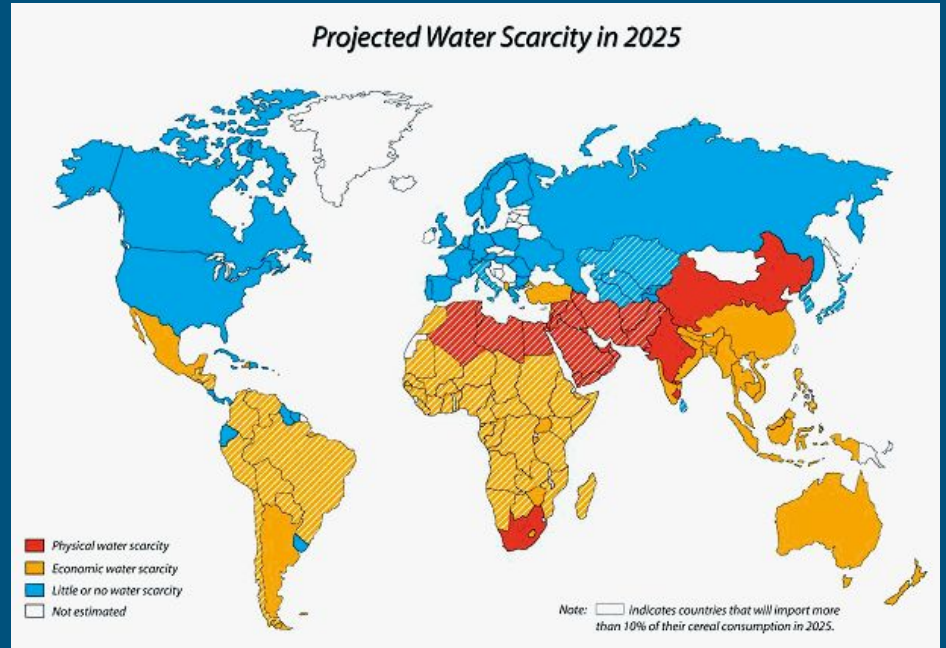
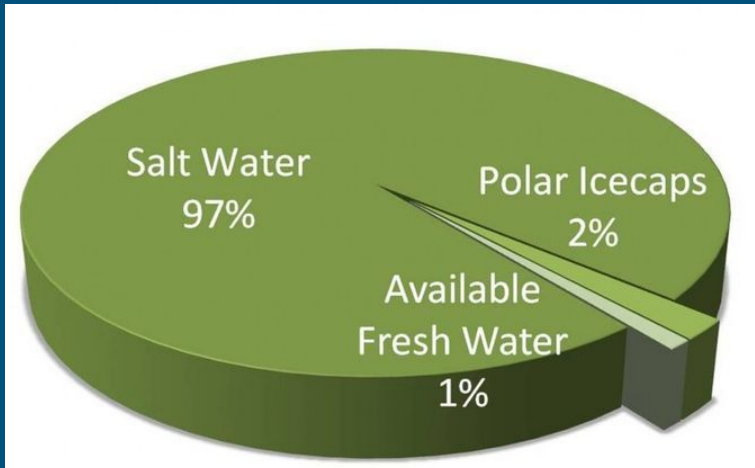
Jonas Castro, Melissa Nguyen

- Members:

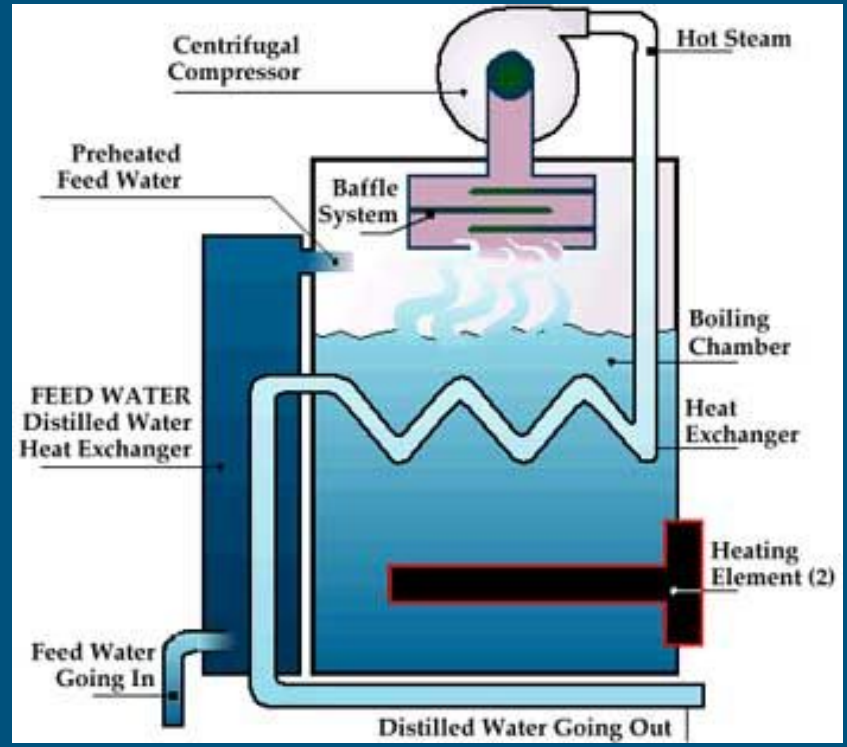
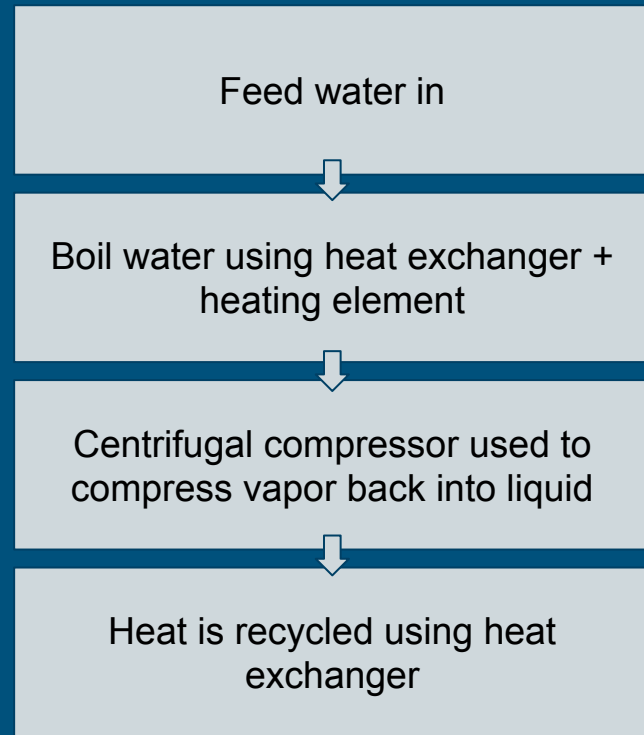
Chris Simons, Nathan Arboleda, Mai Nong, Caroll Le, Eric Kirby, Ian Martin

# Need for desalination

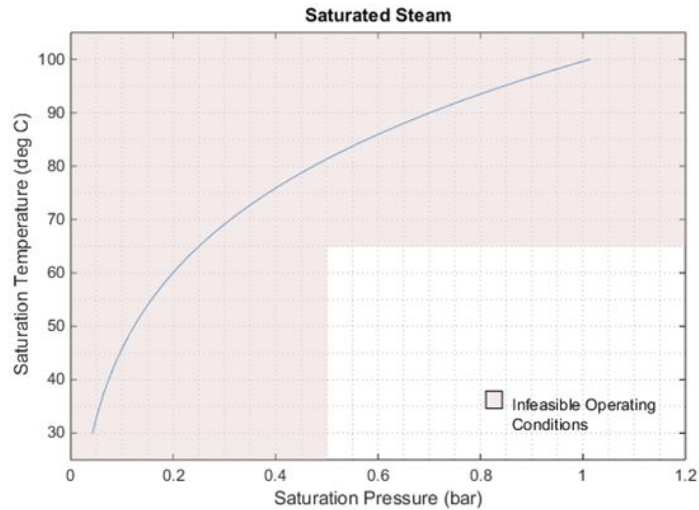
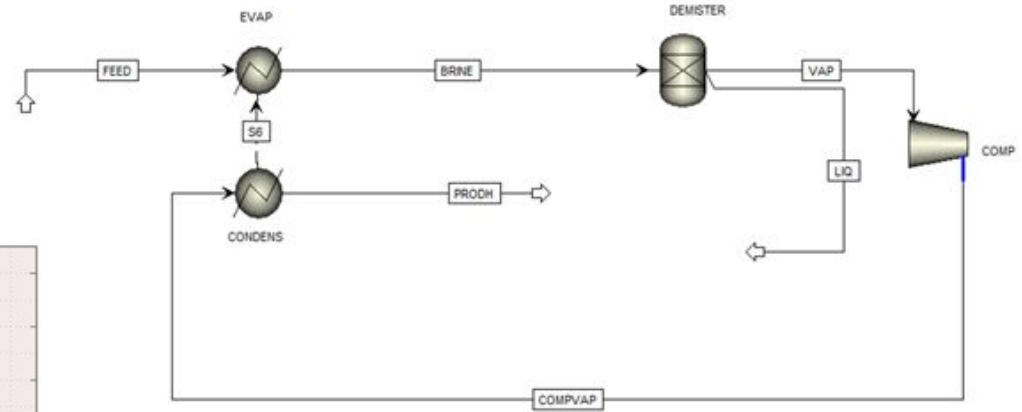
- Potable water is scarce
- We have much more salt than fresh water



# How it works:



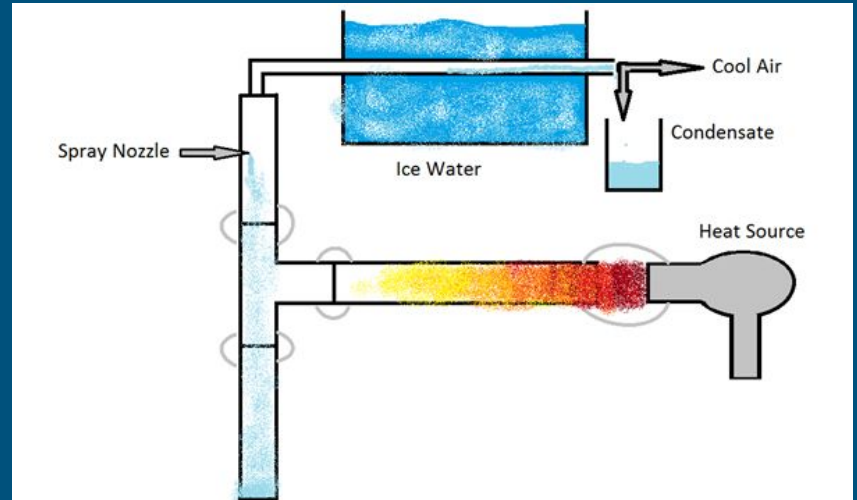
# Aspen Modeling



# Prototype

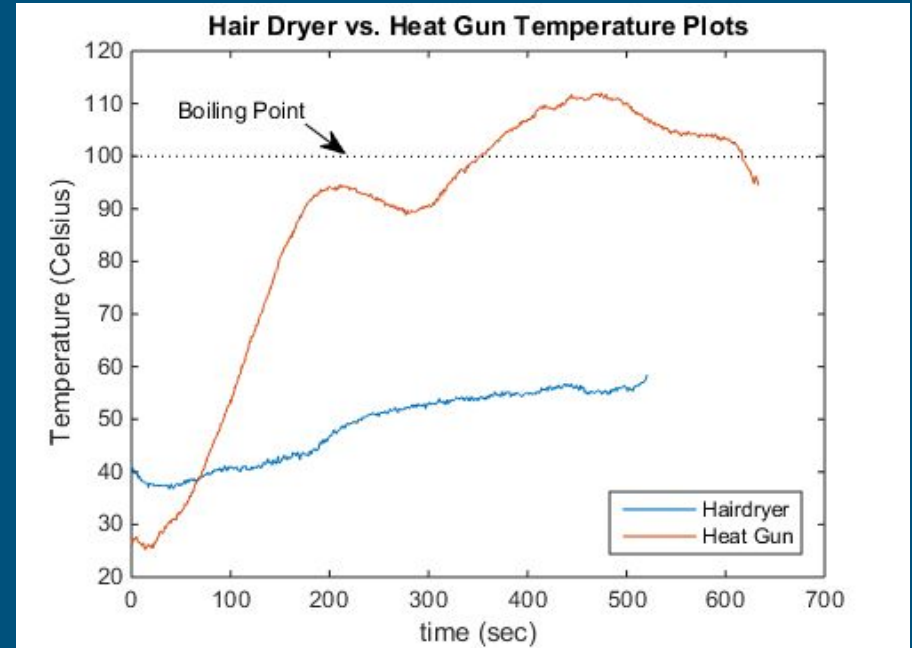
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- Heat gun
- Air duct (galvanized steel)
- Modified mister
- Condenser coil (copper)



# Controls Subteam

- Use Aspen to simulate compression optimal conditions
- Gathered temperature data to correlate heat applied vs. temperature
- Goal: Create a PID control system to regulate temperature



# Quality Function Deployment

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	Importance (0-100%)	304 Stainless Steel	Aluminium	PVC	Copper Type K
<b>Corrosivity</b>	0.25	4	4	4	4
<b>Cost</b>	0.15	1	3	5	1
<b>Temp/Pressure</b>	0.4	5	4	1	4
<b>Construction Feasibility</b>	0.2	1	5	4	4
<b>TOTAL</b>	<b>1</b>	<b>3.35</b>	<b>4.05</b>	<b>2.95</b>	<b>3.55</b>



# Mister Buildup Test

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Initial  
mister



Salt  
buildup  
on mister



After  
vinegar  
solution

# What We Learned

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- Current Prototype does not meet desired yield
- Prototype: Does not insulate properly, mister falls off, and current materials cannot withstand heat, vapor does not condense



# Path Forward

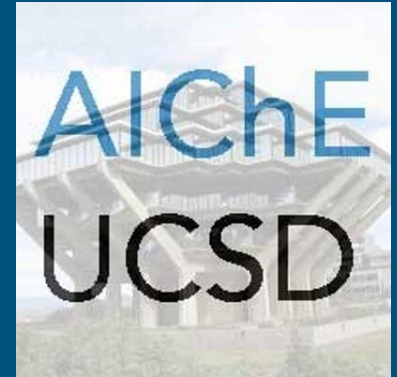
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- 3-D print a model which incorporates all components, even a compressor, and hopefully obtain a higher yield.
- Hydrophobic spray to prevent seawater from damaging our system



# Acknowledgements

- TESC
- QI Design Studio
- Dr. Rick Martin
- Leadership Team



# Thank you!

Questions?

