Utah Department of Natural Resources   (https://naturalresources.utah.gov/)

Utah Division of Water Resources

CLOUD SEEDING

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Enhancing Our Water Supply

Utah has been cloud seeding since the early 1950s to help augment the state's water supply. The Cloud Seeding Act of 1973 (https://le.utah.gov/xcode/Title73/Chapter15/73-15-S3.html) gave authority to the Utah Division of Water Resources to oversee state cloud seeding projects. Ground-based seeders shoot silver iodide into winter clouds where it helps form ice crystals. The seeders are placed along foothills and higher elevations where the release of the cloud seeds is timed so that air currents carry them high into the cloud.

This process is effective because clouds are formed by water vapor and dust. Under certain natural conditions those water droplets will freeze together around the dust or other particles and, when heavy enough, will fall from the sky as snow. Often, there is more snow that can fall but limited by the number of particles around which ice crystals can form. That is why adding particles, or seeds, facilitates and accelerates the process which may lead to more snow falling than would have under natural conditions.

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Cloud seeder at night. Courtesy North American Weather Consultants

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Why is the State of Utah involved in cloud seeding?

Since snowpack is Utah's largest reservoir, increasing the amount of snow that falls is a win for the water supply. It doesn't work just anywhere. The conditions have to be right. Luckily, Utah's topography, climate and reservoirs make winter snowpack enhancement cost-effective. Statistical analysis shows an average increase in precipitation of 5-15% in seeded areas at a cost of about $2.18 per acre-foot for the additional water. The field program runs November to April and is funded jointly by the state and local water interests.

Conditions must be suitable for cloud seeding. Cloud seeding can only occur when there is sufficient water in the atmosphere, which is why Utah's cloud seeding takes place only in the winter. (The summer months are often too dry and don't have enough clouds to seed.) The Division is authorized by the Utah Legislature to split costs with local sponsors up to a maximum of $350,000 per year. There is insufficient funding or local support for a summer seeding program and Utah's semi-arid climate doesn't present the right sets of conditions to generate sufficient precipitation.

Questions?

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Additional Resources

- Cloud Seeding Presentation_Board or Water Resources – (October 8, 2020) (https://water.utah.gov/wp-content/uploads/2020/11/CS_BoardMeeting2020.pdf)
- Towards the Improvement of Winter Orographic Cloud – (December 2019) (https://water.utah.gov/wp-content/uploads/2020/04/cloudseeding_report_revised_final.pdf)
- Utah's Cloud Seeding Suspension Criteria – (May 2019) (https://water.utah.gov/wp-content/uploads/2020/04/Utahs_-Cloud_Seeding_-Suspension_-Criteria_Utah_May_2019.pdf)
- Utah Cloud Seeding: Increased Runoff and Cost Analyses (January 2018) (https://water.utah.gov/wp-content/uploads/2019/CloudSeeding/Cloudseeding2015Final.pdf)
- Cloud Seeding: The Utah Experience (April 2001) (https://water.utah.gov/wp-content/uploads/2019/CloudSeeding/utahexperience4.pdf)
- Weather Modification: Facts About Seeding Clouds (1996) (https://water.utah.gov/wp-content/uploads/2019/CloudSeeding/Facts96c.pdf)
- Uinta Mountains and Basin: Assessment of Extra Area Cloud Seeding (November 1990) (https://water.utah.gov/wp-content/uploads/2019/CloudSeeding/Grant-ExtraAreaEffectcloudseeding.pdf)
- Uinta Basin-Wasatch Front: Precipitation Pattern Analysis (October 1990) (https://water.utah.gov/wp-content/uploads/2019/CloudSeeding/PrecAnalysisUinta-Wasatch.pdf)
- USU Climate Center (https://climate.usu.edu/cloudSeeding/index.php) – Support and publicly available model results that are used by operators in real-time.

Cloud Seeding Reports

2020-2021

- Book Cliffs 2020-2021 (https://water.utah.gov/wp-content/uploads/2021/12/Book-Cliff-Range-Seasonal-Report.pdf)
- High Uintas 2020-2021 (https://water.utah.gov/wp-content/uploads/2021/12/High-Uintas-2020-21-report-final.pdf)
- Northern Utah 2020-2021 (https://water.utah.gov/wp-content/uploads/2021/12/Northern-Utah-2020-21-Report.pdf)
- Six Creeks 2020-2021 (https://water.utah.gov/wp-content/uploads/2021/12/Six-Creeks-Report-2020-2021.pdf)
- Southern and Central Utah 2020-2021 (https://water.utah.gov/wp-content/uploads/2021/12/Southern-Utah-2020-21-Seasonal-Report.pdf)
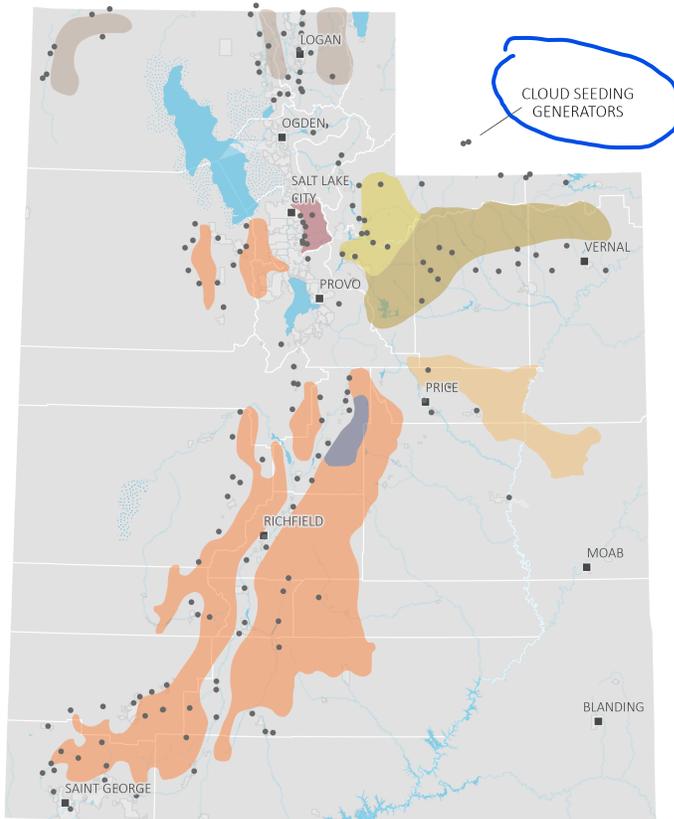
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- Western Uintas 2020-2021 (https://water.utah.gov/wp-content/uploads/2021/12/Western-Uintas-2020-2021-Seasonal-Report.pdf)

2019-2020

- High Uintas 2019-2020 (https://water.utah.gov/wp-content/uploads/2020/11/High-Uintas-2019-2020.pdf)
- Northern Utah 2019-2020 (https://water.utah.gov/wp-content/uploads/2020/11/Northern-Utah-2019-2020.pdf)
- Six Creeks 2019-2020 (https://water.utah.gov/wp-content/uploads/2020/11/Six-Creeks-Final-2019-2020.pdf)
- Southern and Central Utah 2019-2020 (https://water.utah.gov/wp-content/uploads/2020/11/Southern-and-Central-Utah-2019-2020.pdf)
- Western Uintas 2019-2020 (https://water.utah.gov/wp-content/uploads/2020/11/Western-Uintas-2019-2020.pdf)

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(https://water.utah.gov/wp-content/uploads/2021/08/2021-Cloud-Seeding-Map.png)

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