

Cloud First Report

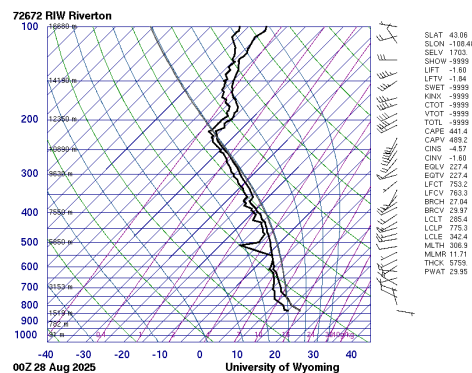
Zach Taylor

ATLS 4151-5151/CVEN 4833-5833/MCEN 4151-5151



The edited photo

The picture was taken at around 1:25 PM on August 27th, 2025. It was taken facing South and slightly West, towards the Flatirons, from the main office tower in the CU Engineering Center. On the Front Range during the summer, skies are clear in the mornings and in the afternoons clouds come over the mountains to fill the sky. This is also generally when storms occur.



The Skew-T diagram

The clouds in the image reveal a coming storm and an unstable atmosphere. There is a large cumulus in the foreground and to the left of center, and a cumulonimbus in the background, over the mountains, darkening that part of the image.

I took the image with my phone, with a 10MP, f/2.4 telephoto camera, the narrowest angle camera of the three front facing cameras on the phone. The phone automatically applies a noise reduction effect to any photo taken, which is irreversible, making the image appear blobby and, ironically, noisy when zoomed in on.



The unedited photo.

When editing the picture, I decided to brighten the image and move the exposure higher, so I could increase the contrast, as well as changing the levels to make the shadows and highlights pop. This had the effect of increasing some detail at the edges of the clouds against the sky, and against the darker clouds in the background, but I lost detail in the central, brighter regions of the clouds. There is also some artifacting from the contrast effect with incorrectly placed thresholds around some of the edges, as well as some subtle purple squares in some places, presumably caused by the phone's automatic filter.

References:

<https://pubs.usgs.gov/pp/1019/report.pdf>

https://www.weather.uwyo.edu/upperair/sounding_legacy.html

<https://world-weather.info/forecast/usa/boulder/august-2025/>

Image Assessment Form
Flow Visualization
Spring 2010

Name(s) Zach Taylor

Assignment: Date:

Scale: +, ! = excellent ✓ = meets expectations; good. ~ = Ok, could be better. X = needs work.

NA = not applicable

Art	Your assessment	Comments
Intent was realized	✓	
Effective	✓	
Impact	✓	
Interesting	✓	
Beautiful	✓	
Dramatic	~	
Feel/texture	~	
No distracting elements	~	
Framing/cropping enhances image	NA	

Flow	Your assessment	Comments
Clearly illustrates phenomena	✓	
Flow is understandable	✓	
Physics revealed	✓	

Details visible	√	
Flow is reproducible	√	
Flow is controlled	√	
Creative flow or technique	√	
Publishable quality	√	

Photographic technique	Your assessment	Comments
Exposure: highlights detailed	~	
Exposure: shadows detailed	√	
Full contrast range	√	
Focus	√	
Depth of field	√	
Time resolved	√	
Spatially resolved	√	
Clean, no spots	X	

Report		Your assessment	Comments
Describes intent	Artistic	√	

	Scientific	✓	
Describes fluid phenomena			
Estimates appropriate scales	Reynolds number etc.	NA	
Calculation of time resolution etc.	How far did flow move during exposure?	NA	
References:	Web level	✓	
	Refereed journal level	✓	
Clearly written		✓	
Information is organized		✓	
Good spelling and grammar		✓	
Professional language (publishable)		✓	
Provides information needed for reproducing flow	Fluid data, flow rates	NA	
	geometry	NA	
	timing	NA	
Provides information needed for reproducing vis technique	Method	NA	
	dilution	Na	
	injection speed	NA	
	settings	NA	
lighting type	(strobe/tungsten, watts, number)	NA	
	light position, distance	NA	

Provides information for reproducing image	Camera type and model	√	
	Camera-subject distance	NA	
	Field of view	NA	
	Focal length	√	
	aperture	NA	
	shutter speed	NA	
	film type and speed or ISO setting	Na	
	# pixels (width X ht)	NA	
	Photoshop techniques	√	
	Print details	NA	
	"before" Photoshop image	√	