13 Exposure Review and Cloud Names

Friday, October 6, 2023 5:08 PM

Today:

Exposure Conclusion Cloud Names

Admin:

Reading assignment.

Up through Clouds 1, 2 and 3.

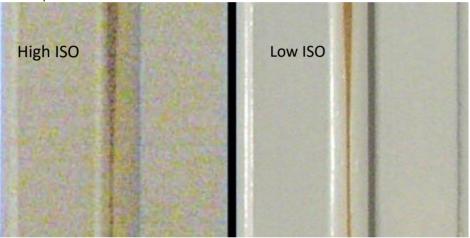
Clouds First post: Edit your post date and time = your cloud image date and time

Guest Lecture October 20: Nicole Sharp, author of FYFD. Attendance required.

I will be gone next Friday afternoon Oct 13 until Monday Oct 23. No equipment checkout during that time Shrey will give video tutorial on Davinci Resolve Oct 16 and 18. Regular attendance OK.

Exposure Conclusion

Other implication of ISO: Noise



http://en.wikipedia.org/wiki/Image noise#Low and high-ISO noise examples

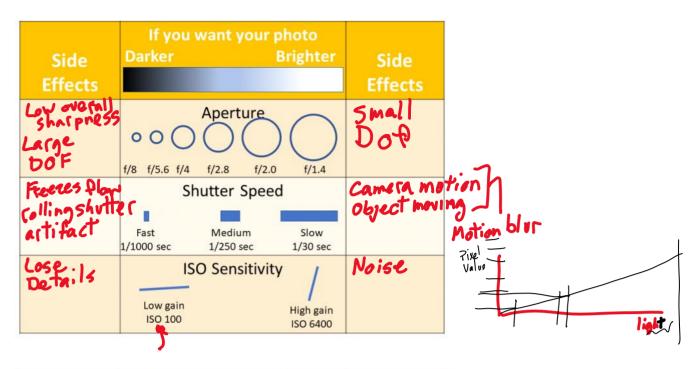
\$\$\$\$ in camera buys less noise at high ISO

Proper exposure = middle value on an average pixel

Same image brightness f/5.6, 1/100 sec, ISO 200 f/8, 1/100 sec, ISO 400 f/4, 1/200 sec, ISO 400

 $\ensuremath{\mathsf{OK}},$ many combinations lead to the same overall brightness. How to choose?

In groups, what are the side effects of each choice?



Side Effects	If you want your photo Darker Brighter	Side Effects
Deep depth of field Maybe lose overall sharpness	Aperture o O O O O O O O O O O O O O O O O O O O	Shallow depth of field BOLE
Rolling shutter artifacts	Fast Medium Slow 1/1000 sec 1/250 sec 1/30 sec	Motion blur
Maybe lose details in quantization	Low gain High gain ISO 100 ISO 6400	Noise

Last topic in photography: Resolution - Temporal and Spatial. Will come back after Clouds

CLOUDS

Learning Objectives:

- 1. Be able to identify cloud types
- 2. Describe air motion and atmospheric stability that govern the appearance of basic cloud types.
- ${\it 3.} \quad \hbox{Interpret weather data with respect to likely clouds, including Skew-T plots and wind soundings.}$
- Cloud first image due Friday Oct 20. Try to ID your cloud. Experts will assist during critique
- Required: be able to state stable vs unstable atmosphere during critique.

Name Race: in one minute, in your group of 3-4 students, how many separate cloud names can you recall? No internet allowed!

Cumulonimbus - thunderstorm
Cirrus
Stratus
Nimbostratus - layer of rain cloud
Cumulus - Simpson cloud
Stratocumulus
Cirrostraus
Cirrocumulus
Pyrocumulus
Mammatus
Altostratus

Great list!

Lenticular Altocumulus

A more complete list, from the Cloudspotter's Guide:

CLOUD CLASSIFICATION TABLE

Clouds are classified according to a Latin 'Linnean' system (similar to the one used for plants and animals), which is based on their heights and appearance. Most clouds fall into one of ten basic groups, known as 'genera'. They can further be defined as one of the possible 'species' for that genus, and any combination of the possible 'varieties'. There are also various accessory clouds and supplementary features that sometimes appear in conjunction with the main cloud types.

(If all this Latin freaks you out, don't worry – it freaks me out too.)

GENUS	SPECIES (CAN ONLY BE ONE)	VARIETIES (CAN BE MORE THAN ONE)	ACCESSORY C SUPPLEMENTA	LOUDS AND RY FEATURES
	humilis		pileus	arcus
Cumulus	mediocris	radiatus	velum	pannus
	congestus		virga	tuba
	fractus		praecipitatio	
Cumulonimbus (extends through all three levels)			praecipitatio	pileus
	calvus		virga	velum
	capillatus	(none)	pannus	arcus
	minimum variet en filmen mer i - minimum kall film kan kan kan kan mari kilipa kan san MM diserim in minimum s Minimum kan	promiser en emmanente en en entre en e	incus	tuba
	The second control of	altern — 100 k. man liganskijský lýgillist kyriteký filipate Andley (1990-lennány lennány 1990-lennány 1990-lenná – konsoletý elikteka.)	mamma	
Stratus	nebulosus	opacus		
	fractus	translucidus	praecipitatio	
	Newson and the september of the control of the september	undulatus		
		translucidus		
Stratocumulus	g i chia integgi informati di binganya pagamanana ingalam inananak i 11 i samina i i - an an-	perlucidus		
	stratiformis	opacus	mamma	
	lenticularis	duplicatus	virga	
CHALC CAMPAGE	castellanus	undulatus	praecipitatio	
		l radiatus		

Stratocumulus	lenticularis	duplicatus	virga
Ollatocallian	castellanus	undulatus	praecipitatio
		radiatus	
	Primer and additional section of the	lacunosus	
		translucidus	
Altocumulus	stratiformis	perlucidus	
	lenticularis	opacus	virga
	castellanus	duplicatus	mamma
	floccus	undulatus	
	pasamon malamma interfere et plant (inc.) - utat (inc.) - men mentebere et in interpret i contrabilità ameni di	radiatus	
	takan mendeleben, semining dan si selakui takan meneri takan, meneri sepanjangan dan dan beraman seminin - 1974	lacunosus	
		translucidus	virga
Ì	каждения до при не по на	opacus	praecipitatio
Altostratus	(none)	duplicatus	pannus
Thiostiatus	apudarente unitarioren y guarante e a malignatura e e e e e e e e e e e e e e e e e e e	undulatus	mamma
		radiatus	
Nimbostratus (extends through more than one level)			praecipitatio
	(none)	(none)	virga
	and the second s		pannus
Cirrus	fibratus	intortus	
	uncinus	radiatus	
	spissatus	vertebratus	mamma
	castellanus	duplicatus	97000-17000-17000-1700-1700-1700-1700-17
	floccus		
Cirrocumulus	stratiformis		
	lenticularis	undulatus	virga
	castellanus	lacunosus	mamma
	floccus		
Cirrostratus	fibratus	duplicatus	(none)
	nebulosus	undulatus	

Most complete list, from the authority, the World Meteorological Organization: https://cloudatlas.wmo.int/en/cloud-classification-summary.html

Fun book on how the clouds got these names, given by Luke Howard in mid 1800s :

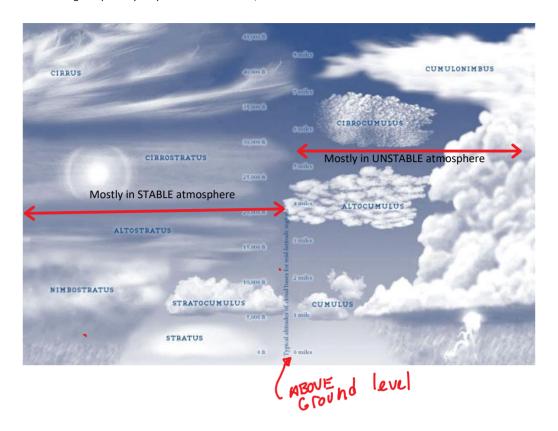
Hamblyn, Richard. The Invention of Clouds: How an Amateur Meteorologist Forged the Language of the Skies. First Edition. New York: Picador, 2002. Available for checkout

Best clouds physics book, easy read:

- Gavin Pretor-Pinney, *The Cloudspotter's Guide* (Perigee/Penguin, 2006). Next, (for free)
- Thomas Carney et al., AC 00-57 Hazardous Mountain Winds and Their Visual Indicators (Federal Aviation Administration, 1997), http://rgl.faa.gov/Regulatory and Guidance Li brary/rgAdvisoryCircular.nsf/0/780437D88CBDA FD086256A94006FD5B8?OpenDocument.
- https://www.metoffice.gov.uk/binaries/content/assets/mohippo/pdf/r/cloud types for observers.pdf

Other cloud and atmospheric science books available for checkout; my office. TONS of online info, most is $\mathsf{OK}.$

Following info partially adapted from Mike Baker, local NOAA Weather Service forecaster.



Pretor-Pinney, Gavin. The Cloudspotter's Guide. Perigee/Penguin, 2006.

Hold out three fingers at arm's length. Can you cover a cloud element (clump) with three fingers? No- then it's a low cloud, cumulus variety

If it's between one and three fingers in width, then it's a mid level, alto-type Smaller than one finger = cirro-level, high cloud.

No cloud elements, just smooth layers = stratus types. If there is visible darkening on the bottom, then it's a low level or alto level layer. If it's all bright, then it's cirrostratus.