Central Oregon
Skyglow Measurement Network

Methods and
Results from July 2019 – March 2020

Addendum
Rimrock Ranch
Data from April – June, 2020

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Rimrock Ranch
Sky Quality Monitor Data

- SQM installed at Rimrock Ranch in Central Oregon by Jim Hammond of the Sisters Astronomy Club, Sisters, Oregon

- First two months of data: April 21 – June 23, 2020

- Analyzed the Rimrock Ranch data through the same workflow as the rest of the SQM sites in Central Oregon, as described in IDA Oregon Technical Report #2

- Analysis of the first two months of data shows that the Rimrock Ranch location has very dark skies –
    - The average "red trend" value is 21.79 magnitudes/arc second squared, and
    - The overall cloudy sky character shows that clouds appear dark, another indicator of minimal light pollution from the ground at that site
    - These data are very encouraging and need to be considered in the context that
        - They represent a limited time period, and that
        - The data from the other SQM sites in Central Oregon in Technical Report #2 do not yet include data from this same time period – perhaps several of those sites also had equally dark skies during this period?

All SQM Sites – Central Oregon Skyglow Measurement Network
Summary of SQM Measurements from July 2019 – April 2020
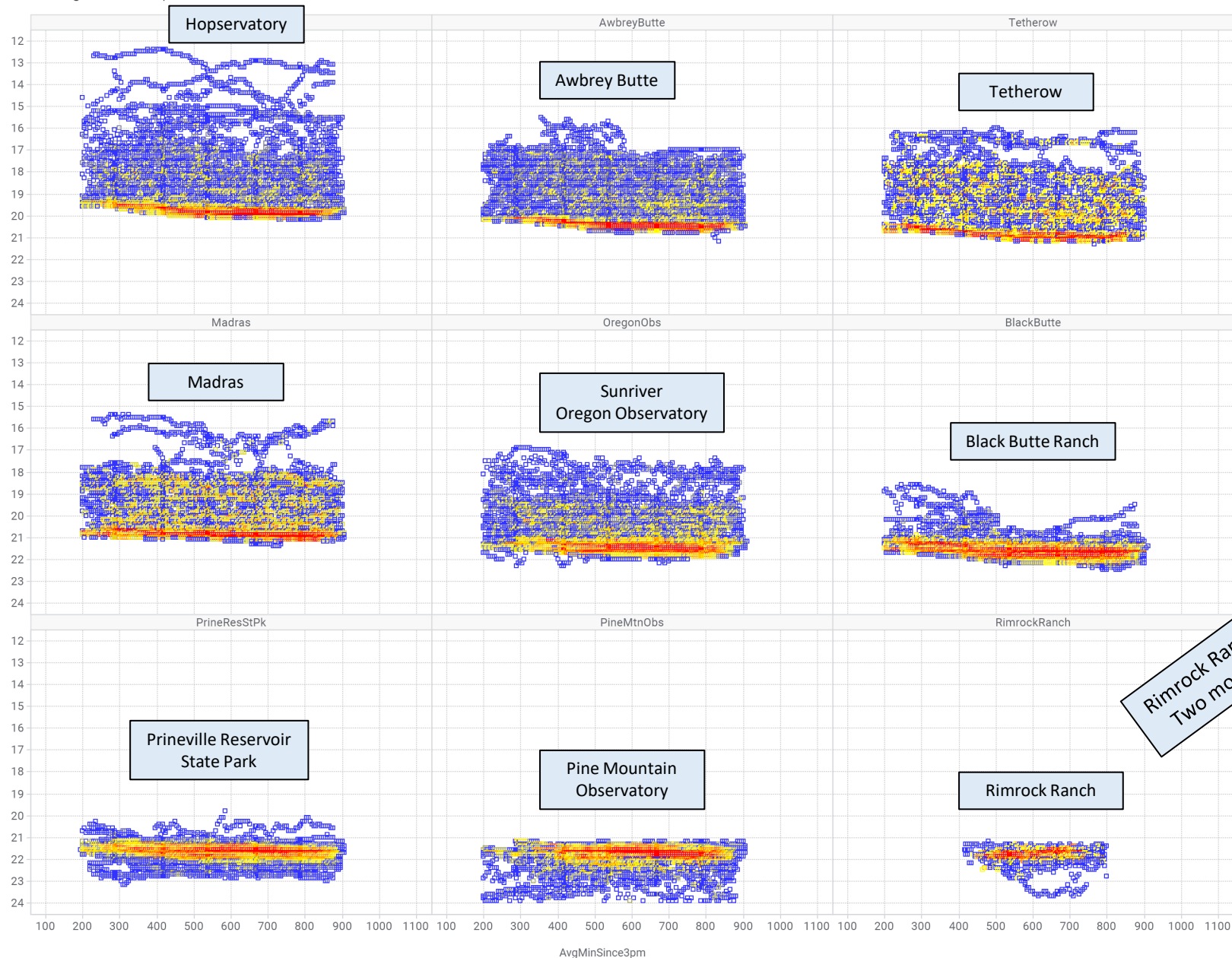
Data Included in plot:
 SQM measurements every 5 minutes, all night long, All nights
 Moon below -10 degrees, Sun below -18 degrees

AvgMsas vs. AvgMinSince3pm

Magnitudes per Arc Second Squared

AvgMsas

Magnitudes per Arc Second Squared

Hopservatory

AwbreyButte

Awbrey Butte

Tetherow

Tetherow

Madras

Madras

OregonObs

Sunriver
Oregon Observatory

BlackButte

Black Butte Ranch

PrineResStPk

Prineville Reservoir
State Park

PineMtnObs

Pine Mountain
Observatory

RimrockRanch

Rimrock Ranch

Rimrock Ranch Added -
Two months of data

Trellis by:
Location

Marker by:
(Row Number)

Color by:
PlotDensity

● 100.00%
● 50.00%
● 10.00%
● 1.00%

AvgMinSince3pm

All SQM Sites – Central Oregon Skyglow Measurement Network
Summary of SQM Measurements from July 2019 – April 2020

AvgMsas vs. AvgMinSince3pm

Data Included in plot:
SQM measurements every 5 minutes, all night long, All nights
Moon below -10 degrees, Sun below -18 degrees
Density plot count of 8 or more per bin

Trellis by:
Location

Marker by:
(Row Number)

Color by:
PlotDensity

100.00%
50.00%
10.00%
1.00%

Hopservatory
Awbrey Butte
Tetherow
Madras
Sunriver
Oregon Observatory
Black Butte Ranch
Prineville Reservoir
State Park
Pine Mountain
Observatory
Rimrock Ranch

Rimrock Ranch Added -
Two months of data

Magnitudes per Arc Second Squared

AvgMsas

AvgMinSince3pm
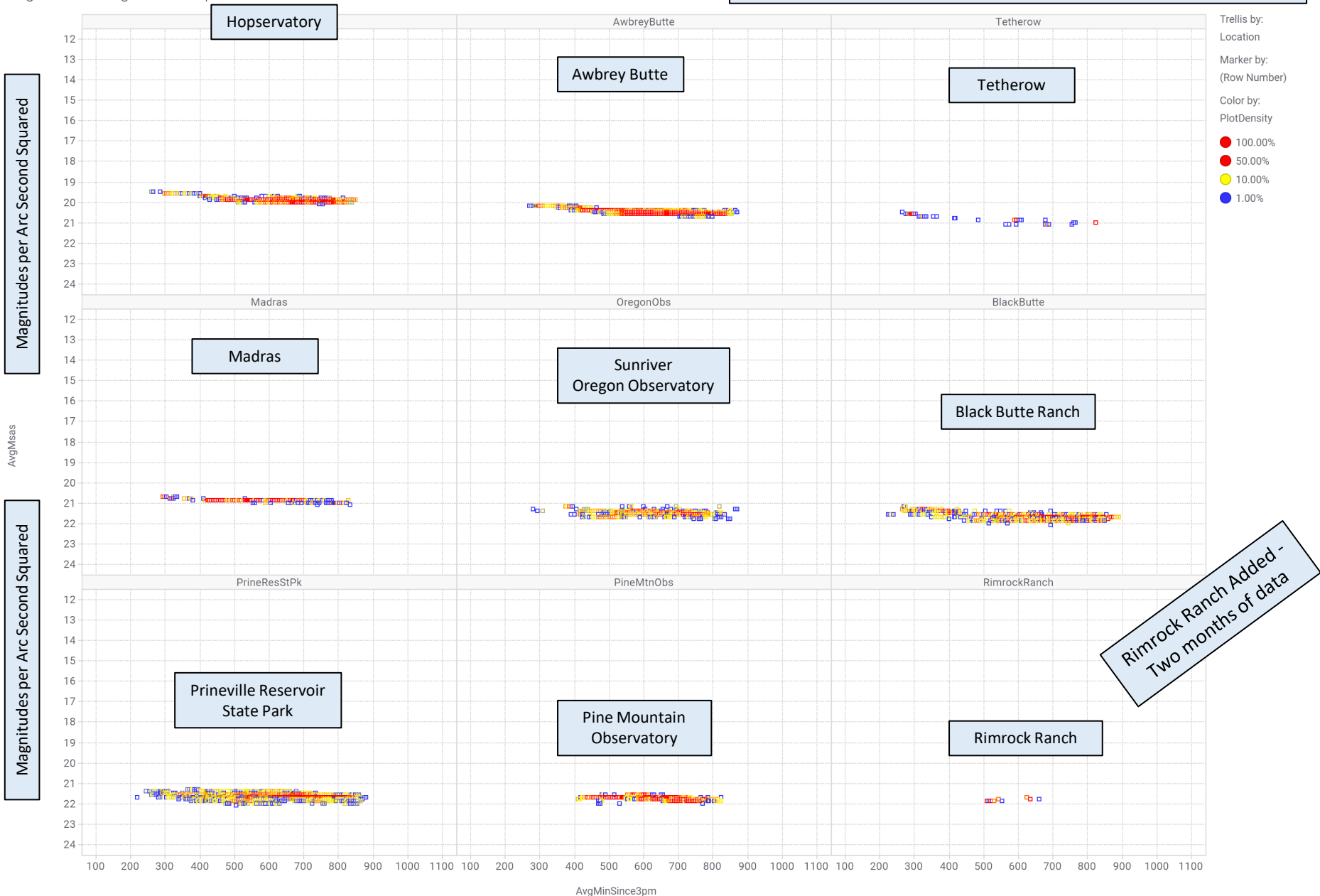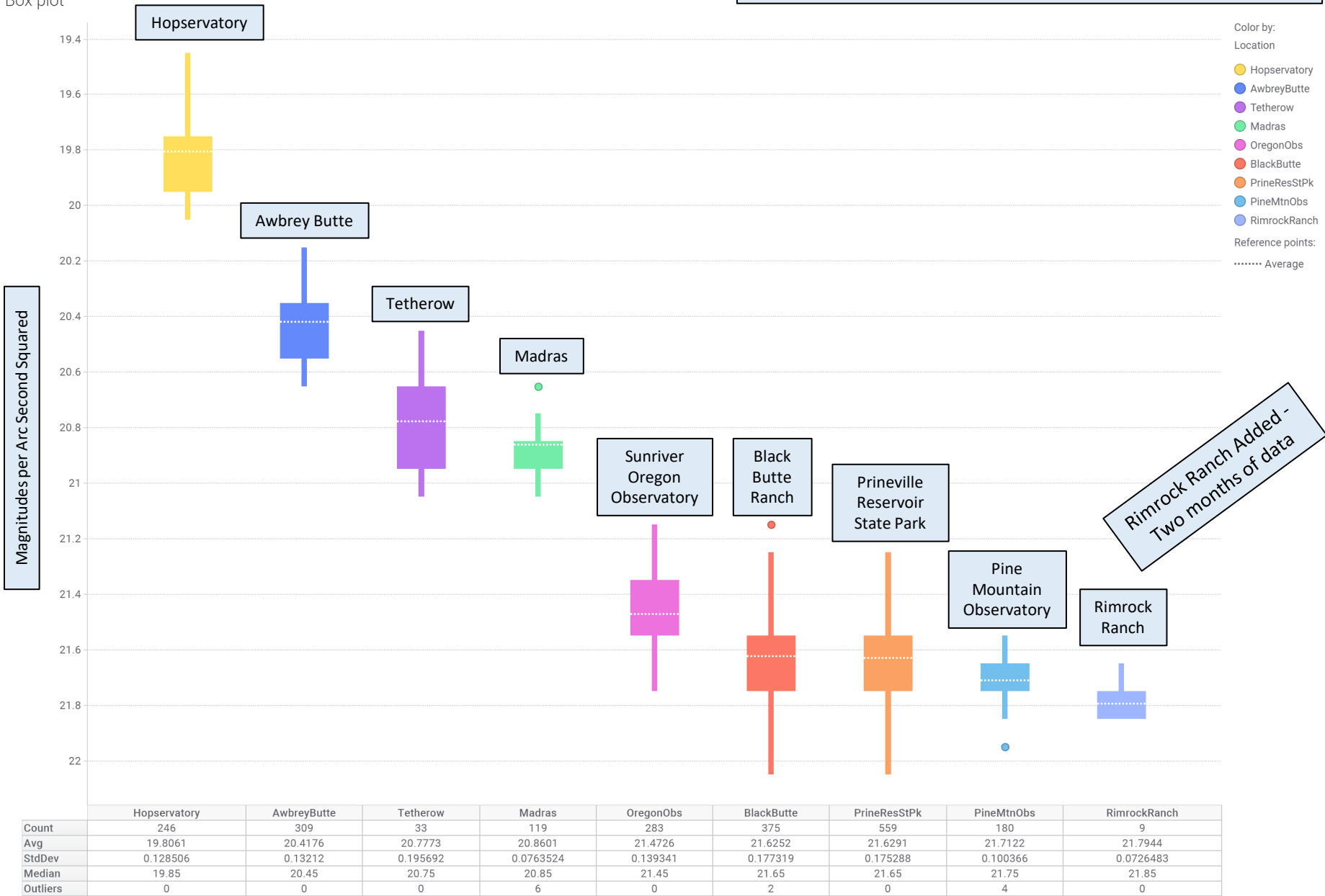
All SQM Sites – Central Oregon Skyglow Measurement Network
Summary of SQM Measurements from July 2019 – April 2020

Data Included in plot:
 SQM measurements every 5 minutes, all night long, All nights
 Moon below -10 degrees, Sun below -18 degrees
 Density plot count of 8 or more per bin

Box plot

Magnitudes per Arc Second Squared

Color by:
Location

Hopservatory
AwbreyButte
Tetherow
Madras
OregonObs
BlackButte
PrineResStPk
PineMtnObs
RimrockRanch

Reference points:
.... Average

Hopservatory
Awbrey Butte
Tetherow
Madras
Sunriver Oregon Observatory
Black Butte Ranch
Prineville Reservoir State Park
Pine Mountain Observatory
Rimrock Ranch

Rimrock Ranch Added - Two months of data

	Hopservatory	AwbreyButte	Tetherow	Madras	OregonObs	BlackButte	PrineResStPk	PineMtnObs	RimrockRanch
Count	246	309	33	119	283	375	559	180	9
Avg	19.8061	20.4176	20.7773	20.8601	21.4726	21.6252	21.6291	21.7122	21.7944
StdDev	0.128506	0.13212	0.195692	0.0763524	0.139341	0.177319	0.175288	0.100366	0.0726483
Median	19.85	20.45	20.75	20.85	21.45	21.65	21.65	21.75	21.85
Outliers	0	0	0	6	0	2	0	4	0

Location

All SQM Sites – Central Oregon Skyglow Measurement Network
Summary of SQM Measurements from July 2019 – April 2020

Summary Statistics for the Box Plot data of the previous slide

Location	Mean	X Brighter	Std Dev	Median	Count	Outliers
Hopservatory	19.81	5.7	0.13	19.85	246	0
Awbrey Butte	20.42	3.3	0.13	20.45	309	0
Tetherow	20.78	2.3	0.19	20.75	33	0
Madras	20.86	2.2	0.08	20.85	119	6
Oregon Obs Sunriver	21.47	1.2	0.14	21.45	283	0
Black Butte Ranch	21.62	1.1	0.18	21.65	375	2
Prineville Res St. Pk	21.63	1.1	0.18	21.65	559	0
Pine Mtn Obs	21.71	1.0	0.1	21.75	180	4
Rimrock Ranch	21.79	0.9	0.07	21.85	9	0

Rimrock Ranch Added -
Two months of data