



# IMPROVE

Interagency Monitoring of Protected Visual Environments

## 2021 CALENDAR





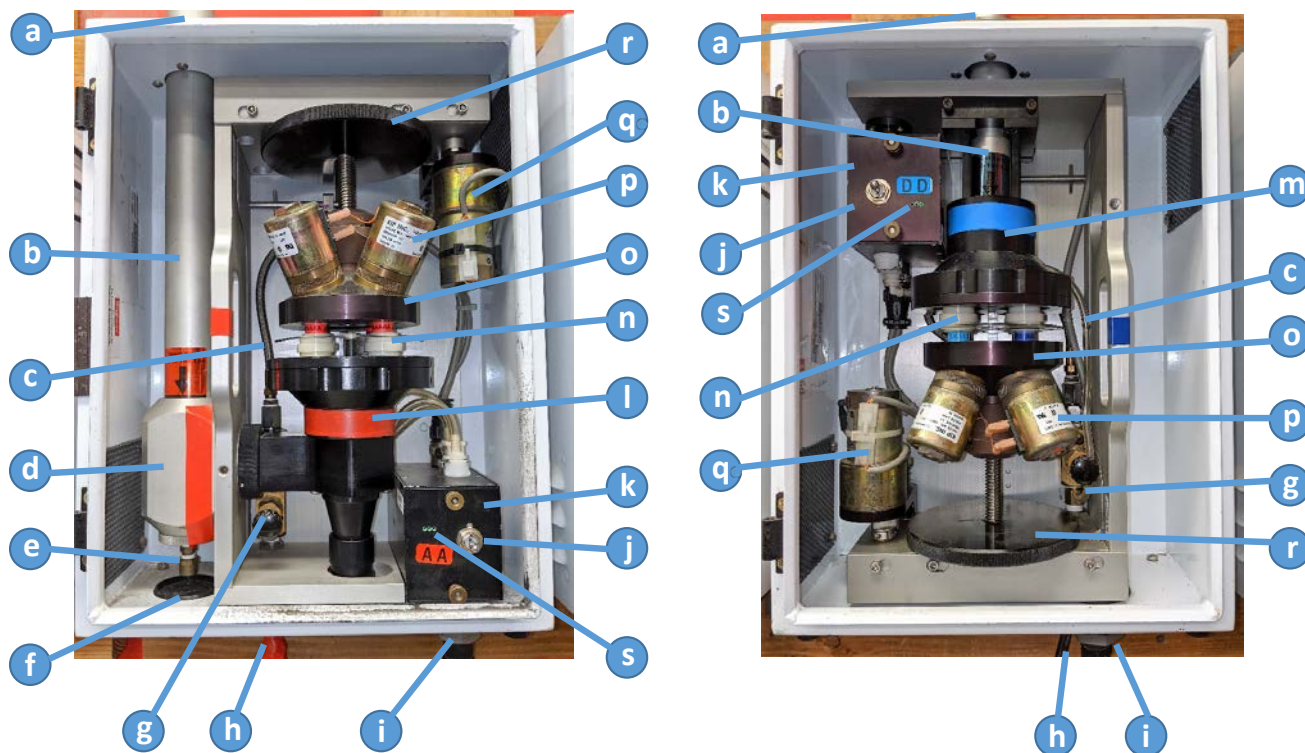


**IMPROVE is a collaborative association of state, tribal, and federal agencies, and international partners.** US Environmental Protection Agency is the primary funding source, with contracting and research support from the National Park Service. The Air Quality Research Center (AQRC) at the University of California, Davis provides field maintenance and operator support, sample handling, elemental analysis, and data processing; Research Triangle Institute (RTI) performs ions analysis; and Desert Research Institute (DRI) performs carbon analysis. IMPROVE data and

documentation are available from the website <http://vista.cira.colostate.edu/improve/> maintained by the Cooperative Institute for Research in the Atmosphere (CIRA).

For questions or problems with optical or scene monitoring equipment, contact Mark Tigges, Air Resource Specialists, Fort Collins, CO at 970-224-9300. For questions or problems with air sampler controllers, filters or flow checks, contact Air Quality Research Center, UC Davis at 530-752-1123, [improvehelpdesk@ucdavis.edu](mailto:improvehelpdesk@ucdavis.edu), or visit <https://aqrc.ucdavis.edu/resources-for-operators>.





**a.** stack compression sleeve  
**b.** inlet stack  
**c.** braided hose  
**d.** inlet tee  
**e.** tee plug

**f.** black cap  
**g.** flow control valve  
**h.** pump hose connector  
**i.** module cable connector  
**j.** motor control toggle switch

**k.** electronics box (ebox)  
**l.** cyclone  
**m.** funnel  
**n.** cartridge with 4 filter cassettes  
**o.** solenoid manifold

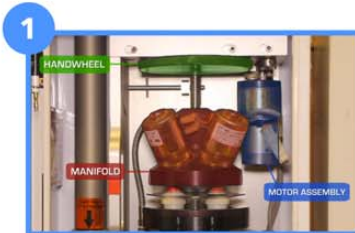
**p.** solenoid valve (4)  
**q.** motor assembly to raise solenoid manifold  
**r.** handwheel (flywheel) to raise manifold  
**s.** Ebox status LED lights



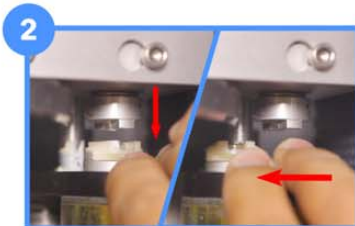
## QUICK REFERENCE: MODULE SCHEMATIC



### Disengaging Manifold Motor to Manually Raise/Lower the Manifold



1 Locate the motor assembly in the module.



2 Separate the motor assembly from the coupling sliding the assembly down. Then pivot it towards to the hand wheel.



2.a A gentle wiggle may be required to slide the assembly up or down.



3 For the A, B, and C modules spin the hand wheel to the left to raise the manifold.



4 Spin the hand wheel to the right to lower the manifold.



4.a The spinning direction to raise and lower the manifold is opposite for the D module.



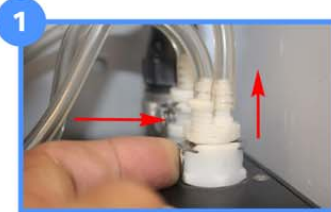
5 If the motor starts to work again it can be reengaged with the hand wheel. Pivot the motor assembly back to its original location.



6 Rotate the hand wheel until the coupling snaps into alignment.

## Electronics-Box Replacement

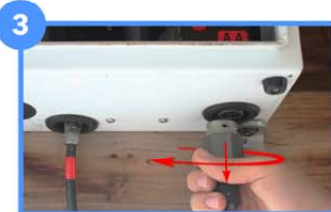
(For A,B, and C modules. For the D module skip steps 3 and 9)



Disconnect the Orifice (ORI) and Cyclone (CYC) hoses by depressing the metal clasp and pulling on the hose.



Disconnect the grey cable located on top of the box by turning the metal collar counter-clockwise.



Disconnect the grey module cable at the bottom of the module, by turning the connector body counter-clockwise.



Loosen the brass knobs located on the black electronics box.



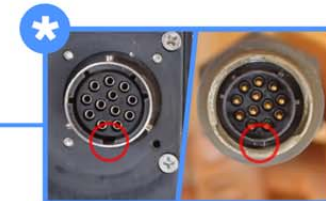
Remove old electronics box and insert the new box.



Tighten the brass knobs.



Re-connect grey cable on the top of the box.



*(line up the key and keyway when connecting the electronic connectors)*



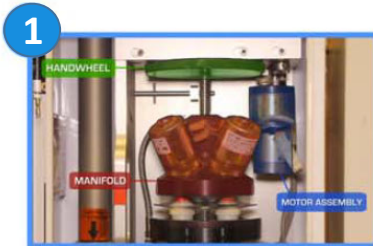
Re-connect the hoses to the electronics box.



Re-connect the bottom grey module cable.



## Replacing Plastic Motor Coupler



1 Locate the motor assembly in the module



4 If the plastic motor coupler does not line up with the upper hub, use the hand wheel to put it into place



2 Separate the motor assembly from the coupling sliding the assembly down. Then pivot it towards the hand wheel.

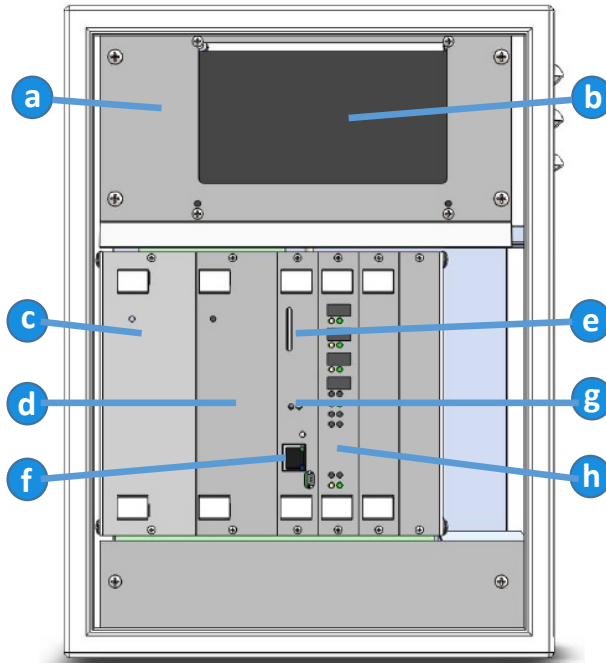


3 Remove the old plastic coupler and place the new one in. Make sure to center it on the metal hub.

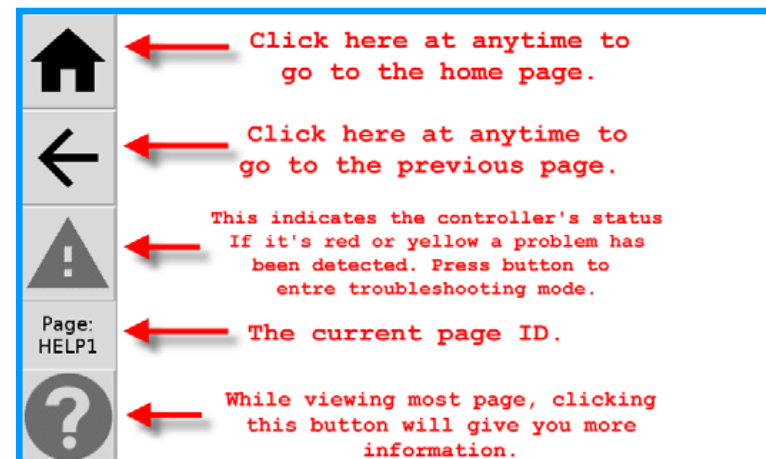
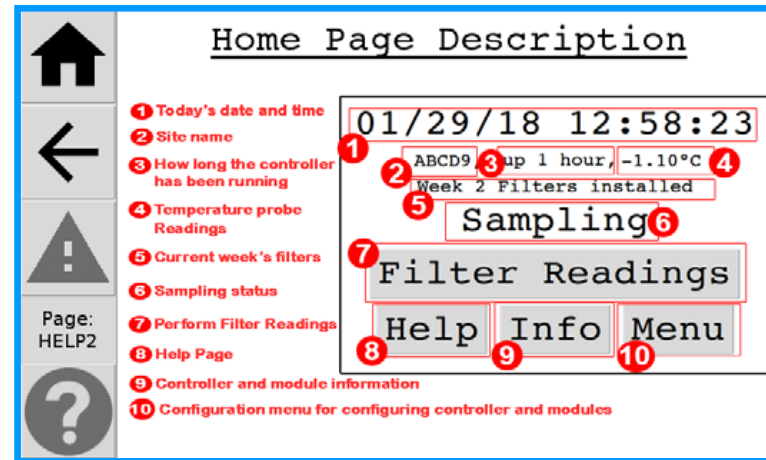


5 The motor should slide into place and the upper and lower hubs should fit securely into the plastic motor coupler

## Controller Information



- |                           |                  |
|---------------------------|------------------|
| a. Display Faceplate      | e. SD Card Slot  |
| b. LCD Touch Screen       | f. Ethernet Port |
| c. 5 V Power Supply Card  | g. CPU Card      |
| d. 24 V Power Supply Card | h. Hub Card      |



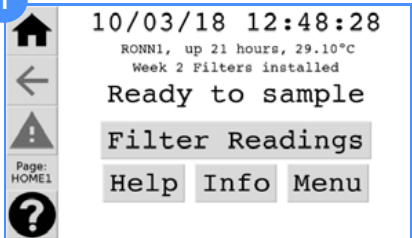
## QUICK REFERENCE: CONTROLLER



### Change Date/Time on New Controller

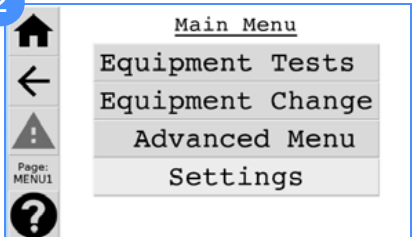
(If the controller is connected to the internet please only edit the time zone)

1




Press the '**Menu**' on the home screen.

2



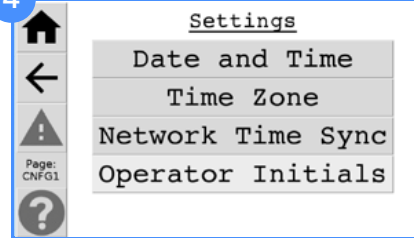
Press '**Settings**'

3




Look up your time zone on the reference map and note the corresponding GMT offset in **Bold**

4



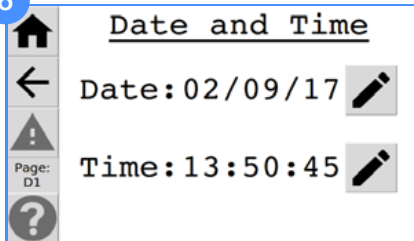
Press '**Time Zone**'

5




Use up/down arrows to select the time zone offset based on step 3

6

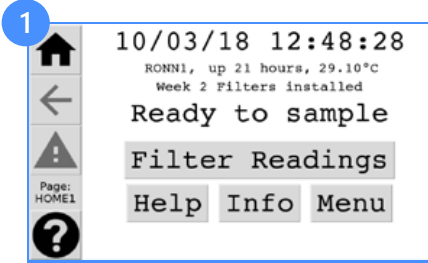


Only if your site is **not** connected to internet do you select the "Date and Time" option in step 4 to manually edit the time.

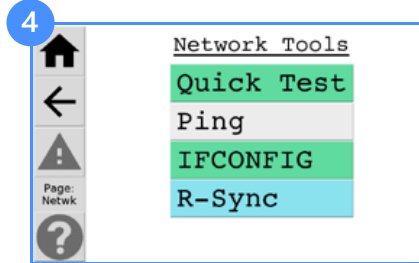
Press the  icon to edit the time



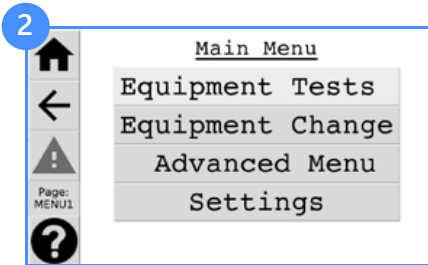
## Test Network Connection and Send Data to Server



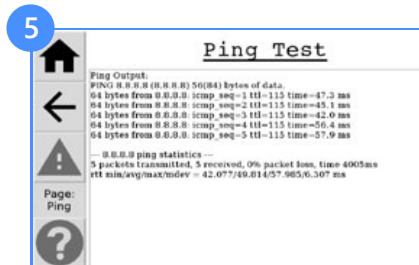
Press the 'Menu' on the home screen.



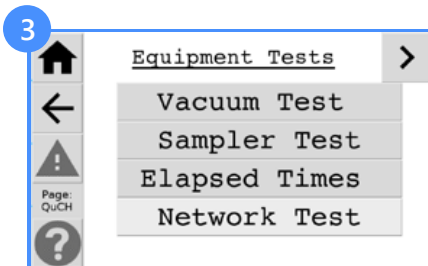
Press 'Ping'



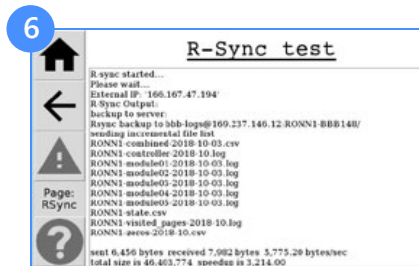
Press 'Equipment Tests'



Read the output of the test. If the 2nd to last line reads '**5 packets transmitted, 5 received, 0% packet loss**' then the controller is successfully connected to the internet



Press 'Network Test'



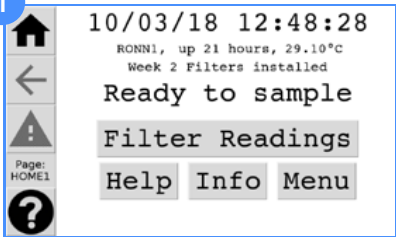
Press the button to go back to 'Network Tools' then select the 'R-Sync' option. This will send the controller data back to the server.

## QUICK REFERENCE: CONTROLLER



### Manage Operator Initials on New Controller

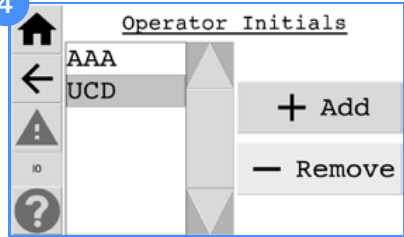
1



10/03/18 12:48:28  
RONN1, up 21 hours, 29.10°C  
Week 2 Filters installed  
Ready to sample  
Filter Readings  
Help Info Menu

Press the **'Menu'** on the home screen.

4

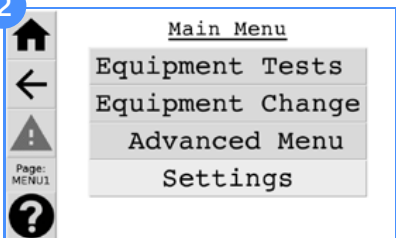


Operator Initials  
AAA  
UCD  
+ Add  
- Remove

Select the initials you wish to remove, then press **'Remove'**

If you wish to add initials press **'Add'**

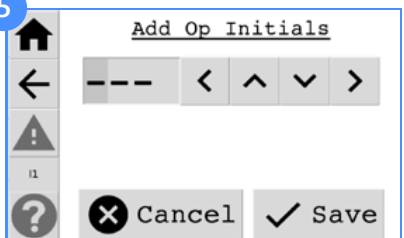
2



Main Menu  
Equipment Tests  
Equipment Change  
Advanced Menu  
Settings

Press **'Settings'**

5

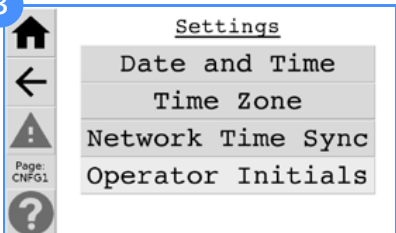


Add Op Initials  
--- < ^ v >  
Cancel Save

When adding initials use the up/down arrows to edit a letter, and left/right arrows to move the cursor.

Please use 3 letter initials for clarity.

3



Settings  
Date and Time  
Time Zone  
Network Time Sync  
Operator Initials

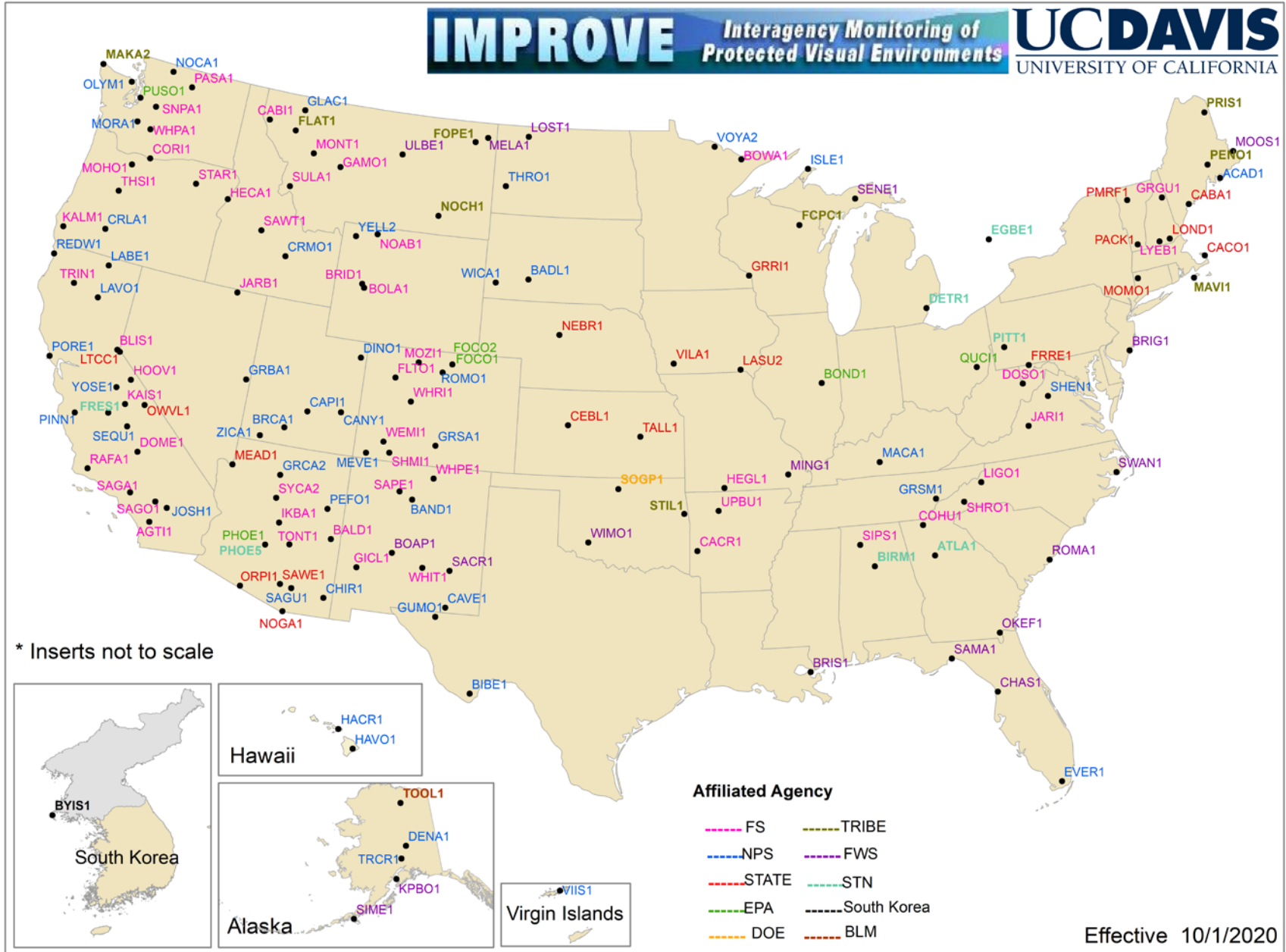
Press **'Operator Initials'**



# IMPROVE

Interagency Monitoring of  
Protected Visual Environments

**UC DAVIS**  
UNIVERSITY OF CALIFORNIA



IMPROVE operator training videos

<https://aqrc.ucdavis.edu/resources-for-operators>

UC Davis General Lab: 530-752-1123

IMPROVE Help Desk: [improvehelpdesk@ucdavis.edu](mailto:improvehelpdesk@ucdavis.edu)



Gros Ventre Road, Grand Teton National Park. *Scott Copeland*



# JANUARY 2021

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
<p>DECEMBER 2020</p> <p>S M T W T F S</p> <p>1 2 3 4 5</p> <p>6 7 8 9 10 11 12</p> <p>13 14 15 16 17 18 19</p> <p>20 21 22 23 24 25 26</p> <p>27 28 29 30 31</p>	<p>FEBRUARY 2021</p> <p>S M T W T F S</p> <p>1 2 3 4 5 6</p> <p>7 8 9 10 11 12 13</p> <p>14 15 16 17 18 19 20</p> <p>21 22 23 24 25 26 27</p> <p>28</p>				<p>New Year's Day 1</p> <p>IMPROVE Particle Sampling Day</p>	2
3	4 IMPROVE Particle Sampling Day	<p>3-2-2 Week 3 2-3-2 Week 1</p> <p>5</p> <p>Change IMPROVE Particle cartridges</p>	6 <i>Alternate Sample Change Day</i>	7 IMPROVE Particle Sampling Day	8	9
10 IMPROVE Particle Sampling Day	11 <i>Alternate Sample Change Day</i>	<p>3-2-2 Week 1 2-3-2 Week 2</p> <p>12</p> <p>Change IMPROVE Particle cartridges</p>	13 IMPROVE Particle Sampling Day	14	15	16 IMPROVE Particle Sampling Day
17 <i>Alternate Sample Change Day</i>	<p>Martin Luther King, Jr. Day 18</p> <p><i>Alternate Sample Change Day</i></p>	<p>3-2-2 Week 2 2-3-2 Week 3</p> <p>19</p> <p>Special cartridge change: move cassette 3 from old cartridge to new.</p> <p>IMPROVE Particle Sampling Day</p>	20 <i>Alternate Sample Change Day</i>	21 <i>Alternate Sample Change Day</i>	22 IMPROVE Particle Sampling Day	23
24	25 IMPROVE Particle Sampling Day	<p>3-2-2 Week 3 2-3-2 Week 1</p> <p>26</p> <p>Change IMPROVE Particle cartridges</p>	27 <i>Alternate Sample Change Day</i>	28 IMPROVE Particle Sampling Day	29	30
31 IMPROVE Particle Sampling Day						





Beehive Geyser, Yellowstone National Park(YELL2). Scott Copeland



# FEBRUARY 2021

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
	1 <i>Alternate Sample Change Day</i>	3-2-2 Week 1 2-3-2 Week 2 2 Change IMPROVE Particle cartridges	3 IMPROVE Particle Sampling Day	4	5	6 IMPROVE Particle Sampling Day
7 <i>Alternate Sample Change Day</i>	8 <i>Alternate Sample Change Day</i>	3-2-2 Week 2 2-3-2 Week 3 9 <i>Special cartridge change: move cassette 3 from old cartridge to new.</i> IMPROVE Particle Sampling Day	10 <i>Alternate Sample Change Day</i>	11 <i>Alternate Sample Change Day</i>	12 IMPROVE Particle Sampling Day	13
14	15 Presidents' Day IMPROVE Particle Sampling Day	3-2-2 Week 3 2-3-2 Week 1 16 Change IMPROVE Particle cartridges	17 <i>Alternate Sample Change Day</i>	18 IMPROVE Particle Sampling Day	19	20
21 IMPROVE Particle Sampling Day	22 <i>Alternate Sample Change Day</i>	3-2-2 Week 1 2-3-2 Week 2 23 Change IMPROVE Particle cartridges	24 IMPROVE Particle Sampling Day	25	26	27 IMPROVE Particle Sampling Day
28 <i>Alternate Sample Change Day</i>					JANUARY 2021 S M T W T F S 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	MARCH 2021 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31







Cirque of the Towers, Popo Aqie Wilderness. *Scott Copeland*



# MARCH 2021

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY																																																																																				
	1 <i>Alternate Sample Change Day</i>	2 3-2-2 Week 2 2-3-2 Week 3 <i>Special cartridge change: move cassette 3 from old cartridge to new.</i> IMPROVE Particle Sampling Day	3 <i>Alternate Sample Change Day</i>	4 <i>Alternate Sample Change Day</i>	5 IMPROVE Particle Sampling Day	6																																																																																				
7	8 IMPROVE Particle Sampling Day	9 3-2-2 Week 3 2-3-2 Week 1 Change IMPROVE Particle cartridges	10 <i>Alternate Sample Change Day</i>	11 IMPROVE Particle Sampling Day	12	13																																																																																				
14 IMPROVE Particle Sampling Day	15 <i>Alternate Sample Change Day</i>	16 3-2-2 Week 1 2-3-2 Week 2 Change IMPROVE Particle cartridges	17 IMPROVE Particle Sampling Day	18	19	20 IMPROVE Particle Sampling Day																																																																																				
21 <i>Alternate Sample Change Day</i>	22 <i>Alternate Sample Change Day</i>	23 3-2-2 Week 2 2-3-2 Week 3 <i>Special cartridge change: move cassette 3 from old cartridge to new.</i> IMPROVE Particle Sampling Day	24 <i>Alternate Sample Change Day</i>	25 <i>Alternate Sample Change Day</i>	26 César Chávez Day IMPROVE Particle Sampling Day	27																																																																																				
28	29 IMPROVE Particle Sampling Day	30 3-2-2 Week 3 2-3-2 Week 1 Change IMPROVE Particle cartridges	31 <i>Alternate Sample Change Day</i>		<div>FEBRUARY 2021</div> <table> <tr><td>S</td><td>M</td><td>T</td><td>W</td><td>T</td><td>F</td><td>S</td></tr> <tr><td></td><td></td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr> <tr><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td></tr> <tr><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td></tr> <tr><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td></tr> <tr><td>28</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>	S	M	T	W	T	F	S			2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28							<div>APRIL 2021</div> <table> <tr><td>S</td><td>M</td><td>T</td><td>W</td><td>T</td><td>F</td><td>S</td></tr> <tr><td></td><td></td><td></td><td></td><td>1</td><td>2</td><td>3</td></tr> <tr><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> <tr><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td></tr> <tr><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td></tr> <tr><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td><td></td></tr> </table>	S	M	T	W	T	F	S					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
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25	26	27	28	29	30																																																																																					







Franklin Lakes, New Jersey. Faris Jawda



# APRIL 2021

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
<div>MARCH 2021</div> <div>S M T W T F S</div> <div>1 2 3 4 5 6</div> <div>7 8 9 10 11 12 13</div> <div>14 15 16 17 18 19 20</div> <div>21 22 23 24 25 26 27</div> <div>28 29 30 31</div>	<div>MAY 2021</div> <div>S M T W T F S</div> <div>2 3 4 5 6 7 8</div> <div>9 10 11 12 13 14 15</div> <div>16 17 18 19 20 21 22</div> <div>23 24 25 26 27 28 29</div> <div>30 31</div>			1	2	3
4	5	3-2-2 Week 1 2-3-2 Week 2	7	IMPROVE Particle Sampling Day		10
IMPROVE Particle Sampling Day	Alternate Sample Change Day	Change IMPROVE Particle cartridges	IMPROVE Particle Sampling Day	8	9	IMPROVE Particle Sampling Day
11	12	3-2-2 Week 2 2-3-2 Week 3  Special cartridge change: move cassette 3 from old cartridge to new.	14	15	16	17
Alternate Sample Change Day	Alternate Sample Change Day	IMPROVE Particle Sampling Day	Alternate Sample Change Day	Alternate Sample Change Day	IMPROVE Particle Sampling Day	
18	19	3-2-2 Week 3 2-3-2 Week 1	21	22	23	24
	IMPROVE Particle Sampling Day	Change IMPROVE Particle cartridges	Alternate Sample Change Day	IMPROVE Particle Sampling Day		
25	26	3-2-2 Week 1 2-3-2 Week 2	28	29	30	
IMPROVE Particle Sampling Day	Alternate Sample Change Day	Change IMPROVE Particle cartridges	IMPROVE Particle Sampling Day			







Lake Tahoe, D.L. Bliss State Park (BLIS1), *Scott Copeland*



# MAY 2021

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
<div>APRIL 2021</div> <div>S M T W T F S</div> <div> <div>1 2 3</div> <div>4 5 6 7 8 9 10</div> <div>11 12 13 14 15 16 17</div> <div>18 19 20 21 22 23 24</div> <div>25 26 27 28</div> </div>	<div>JUNE 2021</div> <div>S M T W T F S</div> <div> <div>1 2 3 4 5</div> <div>6 7 8 9 10 11 12</div> <div>13 14 15 16 17 18 19</div> <div>20 21 22 23 24 25 26</div> <div>27 28 29 30</div> </div>					<div>1</div> <div>IMPROVE Particle Sampling Day</div>
<div>2</div> <div>Alternate Sample Change Day</div>	<div>3</div> <div>Alternate Sample Change Day</div>	<div>3-2-2 Week 2 2-3-2 Week 3</div> <div>4</div> <div>Special cartridge change: move cassette 3 from old cartridge to new.</div> <div>IMPROVE Particle Sampling Day</div>	<div>5</div> <div>Alternate Sample Change Day</div>	<div>6</div> <div>Alternate Sample Change Day</div>	<div>7</div> <div>IMPROVE Particle Sampling Day</div>	<div>8</div>
<div>9</div>	<div>10</div> <div>IMPROVE Particle Sampling Day</div>	<div>3-2-2 Week 3 2-3-2 Week 1</div> <div>11</div> <div>Change IMPROVE Particle cartridges</div>	<div>12</div> <div>Alternate Sample Change Day</div>	<div>13</div> <div>IMPROVE Particle Sampling Day</div>	<div>14</div>	<div>15</div>
<div>16</div> <div>IMPROVE Particle Sampling Day</div>	<div>17</div> <div>Alternate Sample Change Day</div>	<div>3-2-2 Week 1 2-3-2 Week 2</div> <div>18</div> <div>Change IMPROVE Particle cartridges</div>	<div>19</div> <div>IMPROVE Particle Sampling Day</div>	<div>20</div>	<div>21</div>	<div>22</div> <div>IMPROVE Particle Sampling Day</div>
<div>23</div> <div>Alternate Sample Change Day</div>	<div>24</div> <div>Alternate Sample Change Day</div>	<div>3-2-2 Week 2 2-3-2 Week 3</div> <div>25</div> <div>Special cartridge change: move cassette 3 from old cartridge to new.</div> <div>IMPROVE Particle Sampling Day</div>	<div>26</div> <div>Alternate Sample Change Day</div>	<div>27</div> <div>Alternate Sample Change Day</div>	<div>28</div> <div>IMPROVE Particle Sampling Day</div>	<div>29</div>
<div>30</div>	<div>Memorial Day</div> <div>31</div> <div>IMPROVE Particle Sampling Day</div>					







# JUNE 2021

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
		3-2-2 Week 3 2-3-2 Week 1 1	2	3	4	5
		Change IMPROVE Particle cartridges	Alternate Sample Change Day	IMPROVE Particle Sampling Day		
6	7	3-2-2 Week 1 2-3-2 Week 2 8	9	10	11	12
IMPROVE Particle Sampling Day	Alternate Sample Change Day	Change IMPROVE Particle cartridges	IMPROVE Particle Sampling Day			IMPROVE Particle Sampling Day
13	14	3-2-2 Week 2 2-3-2 Week 3 15 Special cartridge change: move cassette 3 from old cartridge to new.	16	17	18	19
Alternate Sample Change Day	Alternate Sample Change Day	IMPROVE Particle Sampling Day	Alternate Sample Change Day	Alternate Sample Change Day	IMPROVE Particle Sampling Day	
20	21	3-2-2 Week 3 2-3-2 Week 1 22	23	24	25	26
	IMPROVE Particle Sampling Day	Change IMPROVE Particle cartridges	Alternate Sample Change Day	IMPROVE Particle Sampling Day		
27	28	3-2-2 Week 1 2-3-2 Week 2 29	30		MAY 2021 S M T W T F S 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	
IMPROVE Particle Sampling Day	Alternate Sample Change Day	Change IMPROVE Particle cartridges	IMPROVE Particle Sampling Day		JULY 2021 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	







Neowise Comet, Popo Agie Wilderness. *Scott Copeland*

# JULY 2021

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
<p>JUNE 2021</p> <p>S M T W T F S</p> <p>1 2 3 4 5</p> <p>6 7 8 9 10 11 12</p> <p>13 14 15 16 17 18 19</p> <p>20 21 22 23 24 25 26</p> <p>27 28 29 30</p>	<p>AUGUST 2021</p> <p>S M T W T F S</p> <p>1 2 3 4 5 6 7</p> <p>8 9 10 11 12 13 14</p> <p>15 16 17 18 19 20 21</p> <p>22 23 24 25 26 27 28</p> <p>29 30 31</p>			1	2	3
4 <i>Alternate Sample Change Day</i>	Independence Day 5 <i>Alternate Sample Change Day</i>	3-2-2 Week 2 6 2-3-2 Week 3 <i>Special cartridge change: move cassette 3 from old cartridge to new.</i> IMPROVE Particle Sampling Day	7 <i>Alternate Sample Change Day</i>	8 <i>Alternate Sample Change Day</i>	9 IMPROVE Particle Sampling Day	10 IMPROVE Particle Sampling Day
11	12 IMPROVE Particle Sampling Day	3-2-2 Week 3 13 2-3-2 Week 1 Change IMPROVE Particle cartridges	14 <i>Alternate Sample Change Day</i>	15 IMPROVE Particle Sampling Day	16	17
18 IMPROVE Particle Sampling Day	19 <i>Alternate Sample Change Day</i>	3-2-2 Week 1 20 2-3-2 Week 2 Change IMPROVE Particle cartridges	21 IMPROVE Particle Sampling Day	22	23	24 IMPROVE Particle Sampling Day
25 <i>Alternate Sample Change Day</i>	26 <i>Alternate Sample Change Day</i>	3-2-2 Week 2 27 2-3-2 Week 3 <i>Special cartridge change: move cassette 3 from old cartridge to new.</i> IMPROVE Particle Sampling Day	28 <i>Alternate Sample Change Day</i>	29 <i>Alternate Sample Change Day</i>	30 IMPROVE Particle Sampling Day	31







Squibnocket Beach, Martha's Vineyard (MAV11). *Faris Jawda*

# AUGUST 2021

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY																																																																																				
1	2 IMPROVE Particle Sampling Day	3-2-2 Week 3 2-3-2 Week 1 3 Change IMPROVE Particle cartridges	4 <i>Alternate Sample Change Day</i>	5 IMPROVE Particle Sampling Day	6	7																																																																																				
8 IMPROVE Particle Sampling Day	9 <i>Alternate Sample Change Day</i>	3-2-2 Week 1 2-3-2 Week 2 10 Change IMPROVE Particle cartridges	11 IMPROVE Particle Sampling Day	12	13	14 IMPROVE Particle Sampling Day																																																																																				
15 <i>Alternate Sample Change Day</i>	16 <i>Alternate Sample Change Day</i>	3-2-2 Week 2 2-3-2 Week 3 Special cartridge change: move cassette 3 from old cartridge to new. 17 IMPROVE Particle Sampling Day	18 <i>Alternate Sample Change Day</i>	19 <i>Alternate Sample Change Day</i>	20 IMPROVE Particle Sampling Day	21																																																																																				
22	23 IMPROVE Particle Sampling Day	3-2-2 Week 3 2-3-2 Week 1 24 Change IMPROVE Particle cartridges	25 <i>Alternate Sample Change Day</i>	26 IMPROVE Particle Sampling Day	27	28																																																																																				
29 IMPROVE Particle Sampling Day	30 <i>Alternate Sample Change Day</i>	3-2-2 Week 1 2-3-2 Week 2 31 Change IMPROVE Particle cartridges			<div>JULY 2021</div> <table> <tr><td>S</td><td>M</td><td>T</td><td>W</td><td>T</td><td>F</td><td>S</td></tr> <tr><td></td><td></td><td></td><td></td><td>1</td><td>2</td><td>3</td></tr> <tr><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> <tr><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td></tr> <tr><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td></tr> <tr><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td><td>31</td></tr> </table>	S	M	T	W	T	F	S					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	<div>SEPTEMBER 2021</div> <table> <tr><td>S</td><td>M</td><td>T</td><td>W</td><td>T</td><td>F</td><td>S</td></tr> <tr><td></td><td></td><td></td><td></td><td>1</td><td>2</td><td>3</td></tr> <tr><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> <tr><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td></tr> <tr><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td></tr> <tr><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td><td></td></tr> </table>	S	M	T	W	T	F	S					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
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Bridger Forest, Bridger Wilderness (BRID1), Scott Copeland



# SEPTEMBER 2021

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY																																																																																											
<p>AUGUST 2021</p> <table> <tr><td>S</td><td>M</td><td>T</td><td>W</td><td>T</td><td>F</td><td>S</td></tr> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr> <tr><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td></tr> <tr><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td></tr> <tr><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td></tr> <tr><td>29</td><td>30</td><td>31</td><td></td><td></td><td></td><td></td></tr> </table>	S	M	T	W	T	F	S	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31					<p>OCTOBER 2021</p> <table> <tr><td>S</td><td>M</td><td>T</td><td>W</td><td>T</td><td>F</td><td>S</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td>1</td></tr> <tr><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td></tr> <tr><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td></tr> <tr><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td></tr> <tr><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td></tr> <tr><td>31</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>	S	M	T	W	T	F	S							1	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31								<p>1</p> <p>IMPROVE Particle Sampling Day</p>	<p>2</p>	<p>3</p>	<p>4</p> <p>IMPROVE Particle Sampling Day</p>
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<p>5</p> <p>Alternate Sample Change Day</p>	<p>Labor Day</p> <p>6</p> <p>Alternate Sample Change Day</p>	<p>3-2-2 Week 2 2-3-2 Week 3</p> <p>Special cartridge change: move cassette 3 from old cartridge to new.</p> <p>7</p> <p>IMPROVE Particle Sampling Day</p>	<p>8</p> <p>Alternate Sample Change Day</p>	<p>9</p> <p>Alternate Sample Change Day</p>	<p>10</p> <p>IMPROVE Particle Sampling Day</p>	<p>11</p>																																																																																											
<p>12</p>	<p>13</p> <p>IMPROVE Particle Sampling Day</p>	<p>3-2-2 Week 3 2-3-2 Week 1</p> <p>14</p> <p>Change IMPROVE Particle cartridges</p>	<p>15</p> <p>Alternate Sample Change Day</p>	<p>16</p> <p>IMPROVE Particle Sampling Day</p>	<p>17</p>	<p>18</p>																																																																																											
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<p>26</p> <p>Alternate Sample Change Day</p>	<p>27</p> <p>Alternate Sample Change Day</p>	<p>3-2-2 Week 2 2-3-2 Week 3</p> <p>Special cartridge change: move cassette 3 from old cartridge to new.</p> <p>28</p> <p>IMPROVE Particle Sampling Day</p>	<p>29</p> <p>Alternate Sample Change Day</p>	<p>30</p> <p>Alternate Sample Change Day</p>																																																																																													







Upstate New Hampshire near Great Gulf Wilderness (GRGU1). *Taylor McGregor*



# OCTOBER 2021

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
					1 IMPROVE Particle Sampling Day	2
3	4 IMPROVE Particle Sampling Day	3-2-2 Week 3 2-3-2 Week 1 5 Change IMPROVE Particle cartridges	6 Alternate Sample Change Day	7 IMPROVE Particle Sampling Day	8	9
10 IMPROVE Particle Sampling Day	11 Alternate Sample Change Day	3-2-2 Week 1 2-3-2 Week 2 12 Change IMPROVE Particle cartridges	13 IMPROVE Particle Sampling Day	14	15	16 IMPROVE Particle Sampling Day
17 Alternate Sample Change Day	18 Alternate Sample Change Day	3-2-2 Week 2 2-3-2 Week 3 19 Special cartridge change: move cassette 3 from old cartridge to new. IMPROVE Particle Sampling Day	20 Alternate Sample Change Day	21 Alternate Sample Change Day	22 IMPROVE Particle Sampling Day	23
24	25 IMPROVE Particle Sampling Day	3-2-2 Week 3 2-3-2 Week 1 26 Change IMPROVE Particle cartridges	27 Alternate Sample Change Day	28 IMPROVE Particle Sampling Day	29	30
31 IMPROVE Particle Sampling Day					SEPTEMBER 2021 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	NOVEMBER 2021 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30







Hike to Marms Lake, Bridger Wilderness (BRID1) *Scott Copeland*



# NOVEMBER 2021

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY																																																																																											
	1 <i>Alternate Sample Change Day</i>	3-2-2 Week 1 2-3-2 Week 2 2 Change IMPROVE Particle cartridges	3 IMPROVE Particle Sampling Day	4	5	6 IMPROVE Particle Sampling Day																																																																																											
7 <i>Alternate Sample Change Day</i>	8 <i>Alternate Sample Change Day</i>	9 3-2-2 Week 2 2-3-2 Week 3 Special cartridge change: move cassette 3 from old cartridge to new. IMPROVE Particle Sampling Day	10 <i>Alternate Sample Change Day</i>	11 Veterans Day <i>Alternate Sample Change Day</i>	12 IMPROVE Particle Sampling Day	13																																																																																											
14	15 IMPROVE Particle Sampling Day	16 3-2-2 Week 3 2-3-2 Week 1 Change IMPROVE Particle cartridges	17 <i>Alternate Sample Change Day</i>	18 IMPROVE Particle Sampling Day	19	20																																																																																											
21 IMPROVE Particle Sampling Day	22 <i>Alternate Sample Change Day</i>	23 3-2-2 Week 1 2-3-2 Week 2 Change IMPROVE Particle cartridges	24 IMPROVE Particle Sampling Day	25 Thanksgiving	26	27 IMPROVE Particle Sampling Day																																																																																											
28 <i>Alternate Sample Change Day</i>	29 <i>Alternate Sample Change Day</i>	30 3-2-2 Week 2 2-3-2 Week 3 Special cartridge change: move cassette 3 from old cartridge to new. IMPROVE Particle Sampling Day			<div>OCTOBER 2021</div> <table> <tr><td>S</td><td>M</td><td>T</td><td>W</td><td>T</td><td>F</td><td>S</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td>1</td><td>2</td></tr> <tr><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td></tr> <tr><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td></tr> <tr><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td></tr> <tr><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td></tr> <tr><td>31</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>	S	M	T	W	T	F	S						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31							<div>DECEMBER 2021</div> <table> <tr><td>S</td><td>M</td><td>T</td><td>W</td><td>T</td><td>F</td><td>S</td></tr> <tr><td></td><td></td><td></td><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td></tr> <tr><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td></tr> <tr><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td></tr> <tr><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td><td>31</td><td></td></tr> </table>	S	M	T	W	T	F	S				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
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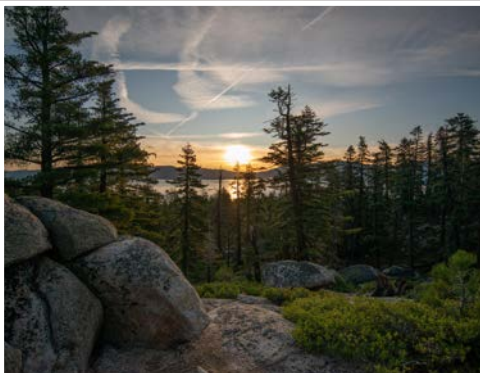
Firefall, Yosemite National Park (YOSE1). *Scott Copeland*

# DECEMBER 2021

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
NOVEMBER 2021 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	JANUARY 2022 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31		1	2	3	4
5	6 IMPROVE Particle Sampling Day	3-2-2 Week 3 2-3-2 Week 1 7 Change IMPROVE Particle cartridges	8 Alternate Sample Change Day	9 IMPROVE Particle Sampling Day	10 IMPROVE Particle Sampling Day	11
12 IMPROVE Particle Sampling Day	13 Alternate Sample Change Day	3-2-2 Week 1 2-3-2 Week 2 14 Change IMPROVE Particle cartridges	15 IMPROVE Particle Sampling Day	16	17	18 IMPROVE Particle Sampling Day
19 Alternate Sample Change Day	20 Alternate Sample Change Day	3-2-2 Week 2 2-3-2 Week 3 21 Special cartridge change: move cassette 3 from old cartridge to new. IMPROVE Particle Sampling Day	22 Alternate Sample Change Day	23 Alternate Sample Change Day	24 Winter Holiday IMPROVE Particle Sampling Day	25
26	27 Winter Holiday IMPROVE Particle Sampling Day	3-2-2 Week 3 2-3-2 Week 1 28 Change IMPROVE Particle cartridges	29 Alternate Sample Change Day	30 Winter Holiday IMPROVE Particle Sampling Day	31 Winter Holiday	







Photographs taken by *Scott Copeland, Faris Jawda, Taylor McGregor.*  
 Cover Photo: Schwabacher Landing, Grand Teton National Park. *Scott Copeland*

