

Files Provided: RAW data file (ascii), Default Penvals (mat) – more on that later, and this [HowTo](#)

2022_01_31_Fisher

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Name

Pro51_DefaultPenvals.mat

Pro51_HowTo.pptx

STN1144.raw

PET_FUG20_STN_01.tap

STN1144.raw

1

\$ Heat flow probe log

2

\$ ACCT Accoms interval 120

3

\$ OHMS Heater Ohms 3.150

4

\$ ACCT Acc deadband 15

5

\$ HOTS Heat pulse duration 20

6

\$ HOTP Heat pulse watts 100.000000

7

\$ HSTS Insertion dwell 10

8

\$ SPR Log interval 2

9

\$ HIDS Working depth 100

10

\$ HRDS New dataset depth 30

11

\$ PHPT Post heat pulse time 10

12

\$ VBOSE Verbose mode 1

13

\$ AUTO Autonomous Mode 1

14

21-02-22 14:47:57:638 21-02-22 14:47:57 ACC X105 Y-68 Z8 V25.390 D9.107 THM 27.431 30.458 30.753 32.266 34.551 36.750 36.932 36.872 36.713 37.148 37.226 37.135 36.775 36.590

15

21-02-22 14:47:59:607 21-02-22 14:47:59 ACC X107 Y-64 Z8 V25.390 D9.118 THM 27.432 30.469 30.757 32.267 34.580 36.752 36.936 36.872 36.719 37.156 37.231 37.141 36.783 36.590

16

21-02-22 14:48:01:627 21-02-22 14:48:01 ACC X108 Y-65 Z-3 V25.390 D9.032 THM 27.438 30.486 30.763 32.271 34.596 36.754 36.937 36.870 36.723 37.162 37.237 37.146 36.783 36.591

17

21-02-22 14:48:03:646 21-02-22 14:48:03 ACC X101 Y-65 Z0 V25.380 D9.013 THM 27.444 30.500 30.769 32.274 34.615 36.760 36.938 36.871 36.722 37.166 37.242 37.150 36.784 36.594

18

21-02-22 14:48:05:615 21-02-22 14:48:05 ACC X106 Y-63 Z7 V25.380 D9.096 THM 27.447 30.507 30.773 32.275 34.627 36.766 36.941 36.875 36.722 37.170 37.244 37.151 36.782 36.593

19

21-02-22 14:48:07:635 21-02-22 14:48:07 ACC X105 Y-64 Z4 V25.370 D9.100 THM 27.448 30.524 30.779 32.277 34.650 36.772 36.944 36.875 36.722 37.172 37.246 37.147 36.779 36.586

20

21-02-22 14:48:09:604 21-02-22 14:48:09 ACC X104 Y-65 Z1 V25.370 D9.048 THM 27.451 30.544 30.785 32.277 34.657 36.766 36.939 36.868 36.717 37.166 37.247 37.142 36.772 36.580

21

21-02-22 14:48:11:624 21-02-22 14:48:11 ACC X109 Y-67 Z1 V25.360 D9.066 THM 27.451 30.564 30.789 32.276 34.653 36.757 36.930 36.864 36.708 37.168 37.245 37.135 36.770 36.569

22

21-02-22 14:48:13:644 21-02-22 14:48:13 ACC X104 Y-61 Z3 V25.350 D9.050 THM 27.452 30.574 30.791 32.275 34.655 36.756 36.927 36.865 36.707 37.169 37.245 37.136 36.771 36.569

23

21-02-22 14:48:15:614 21-02-22 14:48:15 ACC X100 Y-63 Z6 V25.350 D9.061 THM 27.453 30.594 30.795 32.273 34.666 36.754 36.925 36.867 36.703 37.171 37.248 37.141 36.772 36.573

24

21-02-22 14:48:17:633 21-02-22 14:48:17 ACC X109 Y-68 Z4 V25.340 D9.091 THM 27.452 30.625 30.802 32.272 34.671 36.750 36.922 36.868 36.703 37.177 37.251 37.148 36.775 36.579

25

21-02-22 14:48:19:602 21-02-22 14:48:19 ACC X110 Y-66 Z2 V25.340 D9.086 THM 27.451 30.655 30.808 32.271 34.668 36.746 36.918 36.865 36.704 37.181 37.255 37.148 36.773 36.585

26

21-02-22 14:48:21:621 21-02-22 14:48:21 ACC X107 Y-63 Z-3 V25.340 D9.010 THM 27.450 30.667 30.813 32.271 34.670 36.744 36.917 36.864 36.702 37.181 37.255 37.146 36.769 36.585

27

21-02-22 14:48:23:640 21-02-22 14:48:23 ACC X97 Y-59 Z0 V25.340 D8.956 THM 27.451 30.691 30.821 32.272 34.681 36.740 36.913 36.859 36.699 37.178 37.256 37.141 36.762 36.582

28

21-02-22 14:48:25:610 21-02-22 14:48:25 ACC X105 Y-68 Z14 V25.340 D9.140 THM 27.449 30.716 30.831 32.272 34.697 36.736 36.912 36.861 36.695 37.177 37.256 37.136 36.760 36.581

29

21-02-22 14:48:27:629 21-02-22 14:48:27 ACC X112 Y-68 Z10 V25.340 D9.171 THM 27.448 30.749 30.839 32.271 34.704 36.737 36.915 36.867 36.694 37.181 37.257 37.137 36.765 36.584

30

21-02-22 14:48:29:648 21-02-22 14:48:29 ACC X108 Y-63 Z-5 V25.340 D8.983 THM 27.449 30.764 30.846 32.272 34.705 36.738 36.917 36.871 36.694 37.183 37.258 37.139 36.765 36.584

31

21-02-22 14:48:31:617 21-02-22 14:48:31 ACC X100 Y-60 Z-4 V25.340 D8.943 THM 27.454 30.788 30.859 32.274 34.711 36.741 36.918 36.875 36.694 37.189 37.260 37.142 36.761 36.585

32

21-02-22 14:48:33:637 21-02-22 14:48:33 ACC X101 Y-67 Z6 V25.340 D9.058 THM 27.458 30.806 30.874 32.277 34.730 36.744 36.921 36.884 36.698 37.193 37.261 37.144 36.763 36.587

33

21-02-22 14:48:35:607 21-02-22 14:48:35 ACC X112 Y-67 Z9 V25.330 D9.106 THM 27.460 30.831 30.888 32.280 34.744 36.748 36.928 36.895 36.703 37.197 37.264 37.147 36.772 36.595

34

21-02-22 14:48:37:626 21-02-22 14:48:37 ACC X109 Y-65 Z3 V25.330 D9.060 THM 27.460 30.842 30.895 32.281 34.745 36.749 36.929 36.896 36.705 37.199 37.266 37.153 36.778 36.600

35

21-02-22 14:48:39:646 21-02-22 14:48:39 ACC X99 Y-60 Z2 V25.320 D9.008 THM 27.462 30.868 30.906 32.284 34.753 36.750 36.930 36.899 36.707 37.204 37.271 37.163 36.784 36.611

36

21-02-22 14:48:41:616 21-02-22 14:48:41 ACC X104 Y-67 Z-3 V25.320 D8.972 THM 27.467 30.887 30.916 32.286 34.766 36.755 36.932 36.900 36.709 37.210 37.273 37.166 36.786 36.617

37

21-02-22 14:48:43:636 21-02-22 14:48:43 ACC X108 Y-66 Z4 V25.320 D9.026 THM 27.467 30.901 30.923 32.288 34.784 36.760 36.941 36.907 36.712 37.223 37.275 37.172 36.795 36.622

Line: 1

Plain Text

Tab Size: 4

Example RAW data file:

Header

Date and time (2X – don't ask...)

Acceleration (X Y Z)

Voltage

Depth

Thermistors (13 + bottom water)

You can edit the functions
p51_Load_ROQ.m
and
p51_ScanUnix.m
based on your RAW data file.

I think I worked on some non-unix loading script that may come up if you're on a PC, but I'm not sure how well that works (I always use my Mac).

The code has comments (with a lot of pieces commented out). You should be able to find your way through it.

The image displays two side-by-side screenshots of the MATLAB code editor, showing scripts for data processing and file handling.

Left Screenshot (Editor - /Users/michaelhutnak/Dropbox/mfiles/ROQ/ProS1_2020/pS1_Load_ROQ.m):

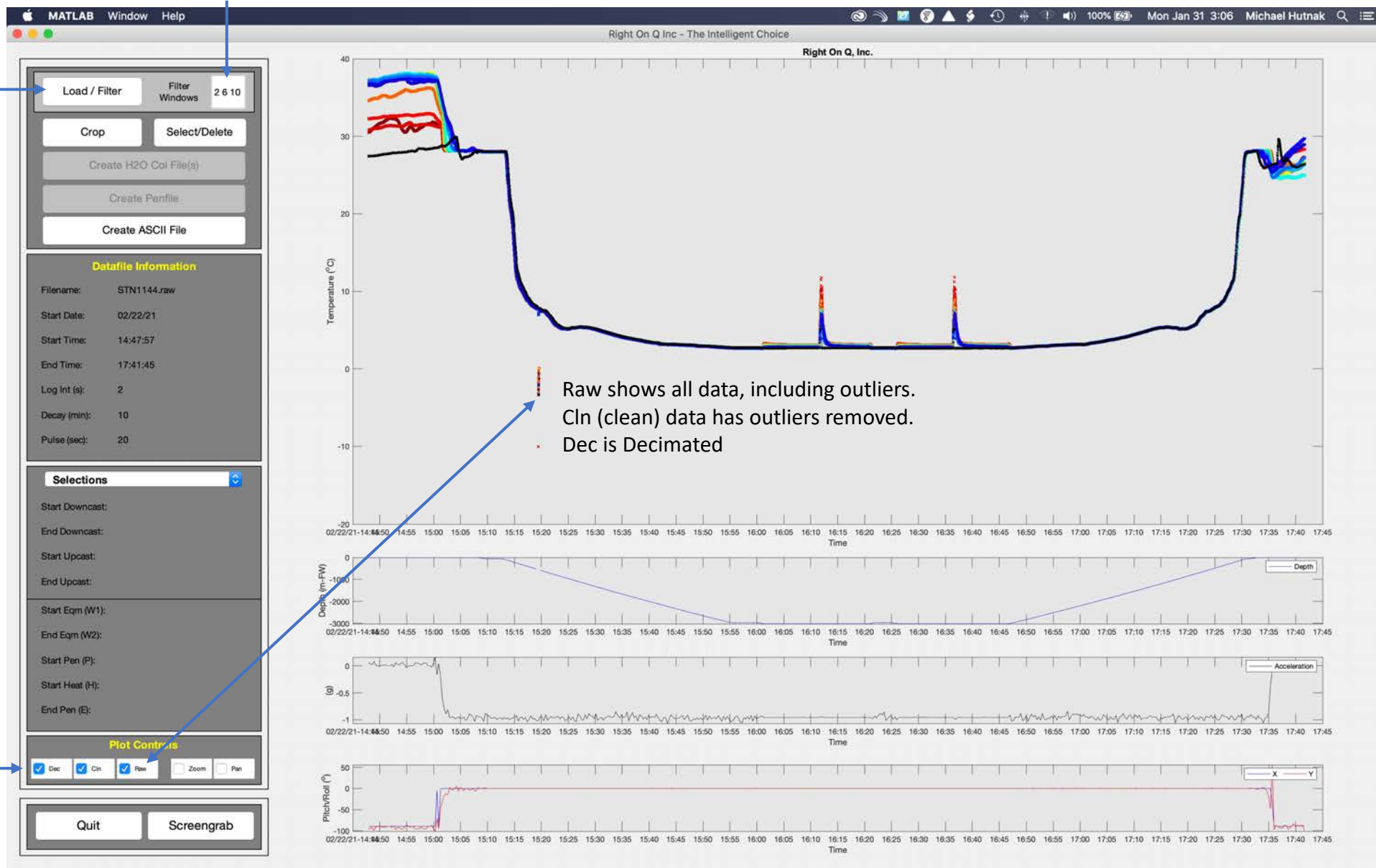
```
1 function ErrorFlag=pS1_Load_ROQ(H)
2 % pS1_Load_ROQ loads an ROQ probe *.dat file and converts
3 %
4 % 2017 -- Michael Hutnak, Right On Q, Inc.
5 % mhutnak@roqinc.com
6 %
7 % Values also stored for Clean (filtered w/ no neg #'s) and Decimated
8 %
9 % Traw      Raw Temperature Data
10 % T         Median Filtered Temperature Data (20s moving)
11 % Pitch     Degrees (x)
12 % Roll      Degrees (y)
13 % G         Acceleration (g)
14 % Tilt      Tilt (degrees - valid only when stationary)
15 % Time      Time (datetime format - use datestr to convert)
16 % Parameters Structure with acquisition parameters used during deployment
17 %
18 %
19 % 05.05.2017
20 % M. Hutnak
21 %
22 global DATA
23 ErrorFlag = 0;
24 %
25 % % EXTRACT FILTERING WINDOWS
26 filterwindows = str2num(H.Exe.Controls.Filter_WL.String);
27 if length(filterwindows)~=3
28     uiwait(errordlg('Must Have Three Filter Window Lengths ','...
29         'Filter Error','modal'));
30     ErrorFlag=1;
31     return
32 end
33 %
34 wlmedian = filterwindows(:,1);
35 wlmean = filterwindows(:,2);
36 wldec = filterwindows(:,3);
37 %
38 if rem(wlmean,2)~=0
39     uiwait(errordlg('Mean Window Length Must be Even Number','...
40         'Filter Error','modal'));
41     ErrorFlag=1;
42     return
43 end
44 %
45 % % INPUT FILE
46 % Open gui to select filename
47 [filename, pathname] = uigetfile({'*.raw'; '*.mat'}, 'Pick an ROQ Probe Output
48 %
49 % Validate the file/path
50 if isequal(filename,0)||isequal(pathname,0)
51     disp('File not found')
52     H_error = errordlg('File not found or not valid');
53     ErrorFlag=1;
54     return
55 else
```

Right Screenshot (Editor - /Users/michaelhutnak/Dropbox/mfiles/ROQ/ProS1_2020/pS1_ScanUnix.m):

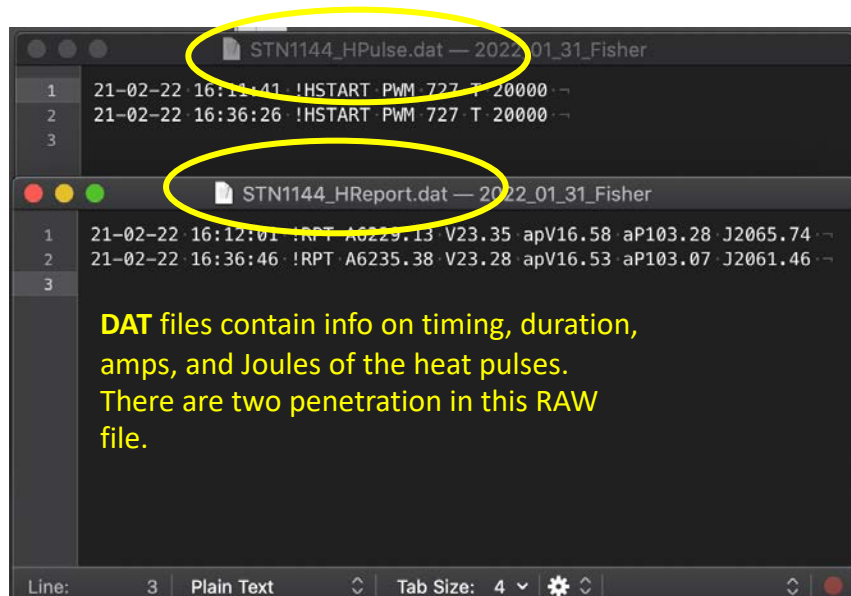
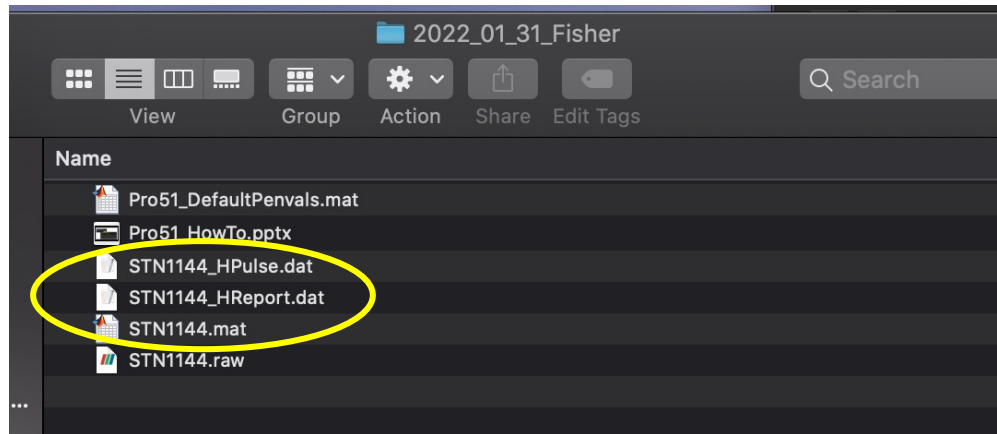
```
1 function [ymd,hms,accx,accy,accz,pwr,z,Traw] = pS1_ScanUnix(H,f,fn)
2 %pS1_ScanUnixQC Scan in Unix data
3 %
4 % Remove Temporary Files Generated by AWK
5 if exist('RawData.tmp','file')
6     delete('RawData.tmp');
7 end
8 %
9 disp(' Unix - using awk...')
10 % Grab all lines with length > 80 (Data)
11 eval(['!awk ''length > 80'' ',f,' > RawData.tmp'])
12 % Grab all Acomms Report lines
13 eval(['!awk ''/RPT/'',f,' > ',fn,'_HReport.dat'])
14 % Grab all Heat Pulse Report lines
15 eval(['!awk ''/HSTART/'',f,' > ',fn,'_HPulse.dat'])
16 %
17 % Prep textscan for variable number of thermistors
18 NoTherm = H.Fileinfo.No_Thermistors.Value;
19 n = repmat(1:n',1,NoTherm); % Thermistors
20 %n = repmat(1:n',1,13); % Thermistors - default 13
21 s = repmat(1:s',1,11); % Time, Acc, depth
22 %
23 % Open the Data File and Scan in the data
24 fid = fopen('RawData.tmp','r');
25 %
26 C = textscan(fid,[s n]);
27 fclose(fid);
28 %
29 % Initialize Matrix AllTdata (All Temperature Data)
30 l = length(C{1});
31 Traw = NaN*zeros(NoTherm+1,l);
32 %
33 % Assign
34 ymd = str2num(char(strrep(C{3},'-',' ')));
35 hms = str2num(char(strrep(C{4},':',' ')));
36 accx = str2num(char(strrep(C{6},'X',' ')));
37 accy = str2num(char(strrep(C{7},'Y',' ')));
38 accz = str2num(char(strrep(C{8},'Z',' ')));
39 pwr = str2num(char(strrep(C{9},'V',' ')));
40 z = str2num(char(strrep(C{10},'D',' ')));
41 for j=1:NoTherm
42     foo = C{11+j};
43     Traw(1,1:length(foo))=foo;
44 end
45 %
46 % Restructure Traw with T1 in row 1, incrementing to Twater
47 Traw(NoTherm+1,:)=Traw(1,:);
48 Traw=Traw(2:end,:);
49 end
50 %
51
```


Running Median, Mean, and Decimate filter windows to create “clean” and “decimated” data.

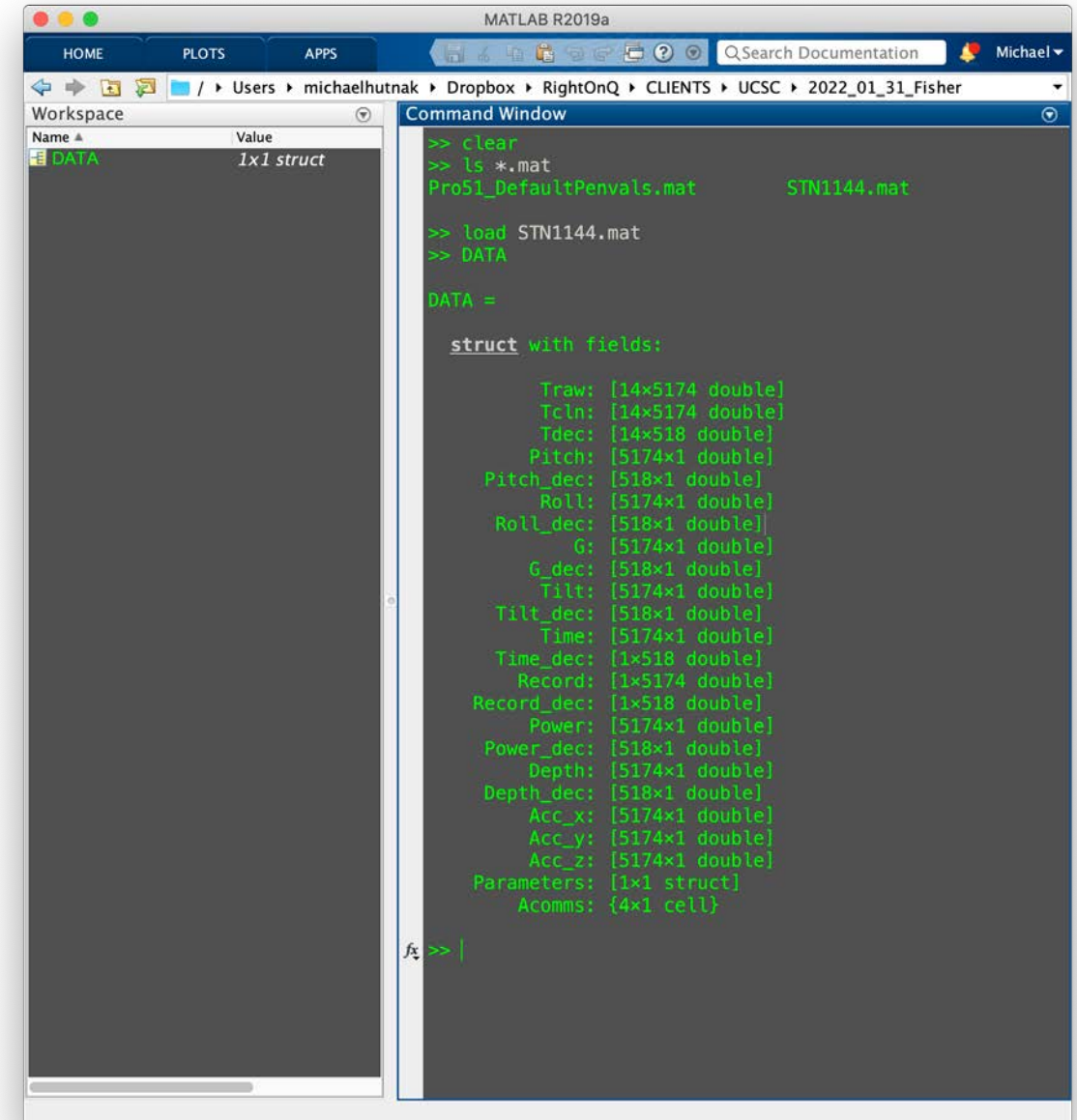
1. Load RAW file

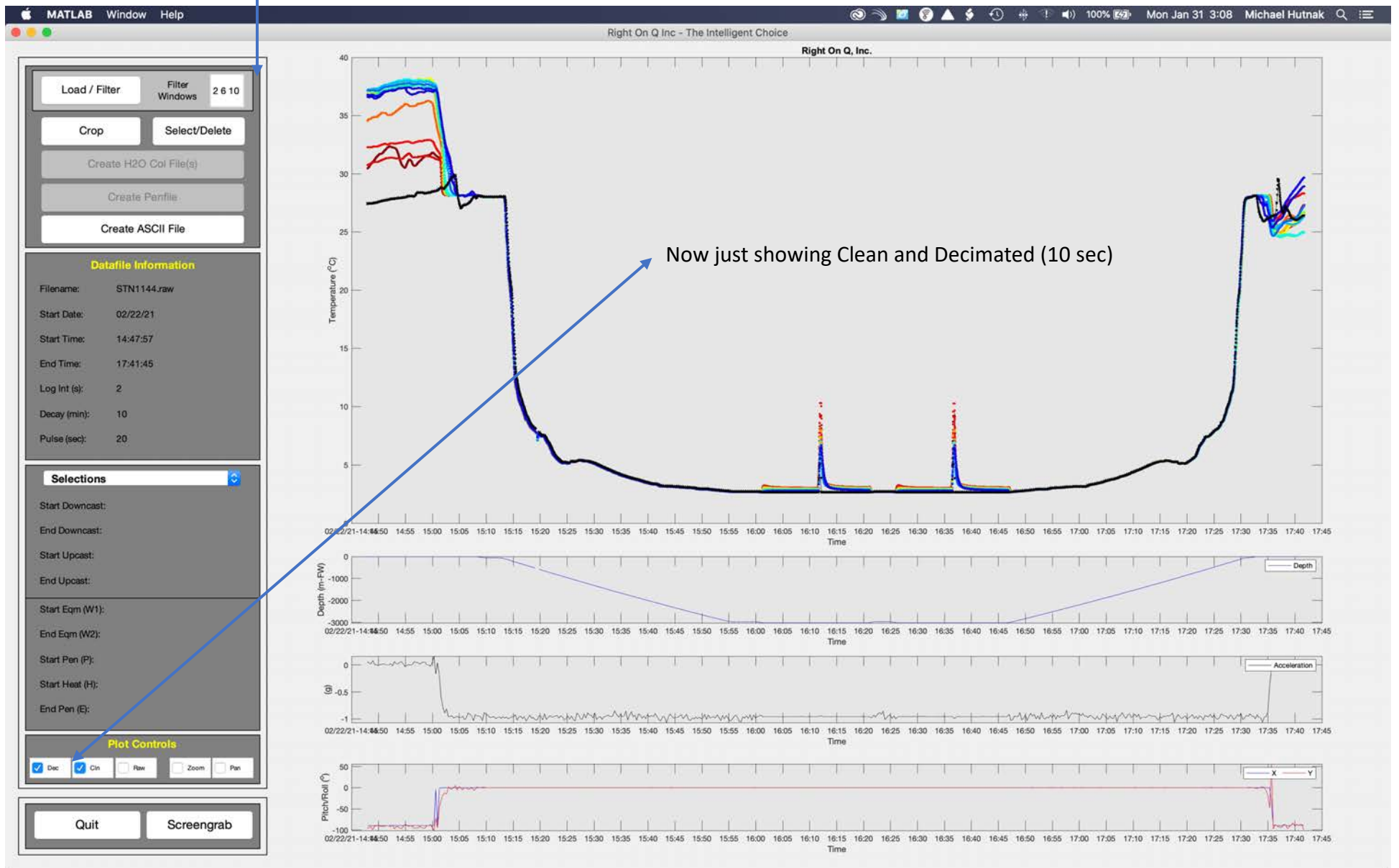


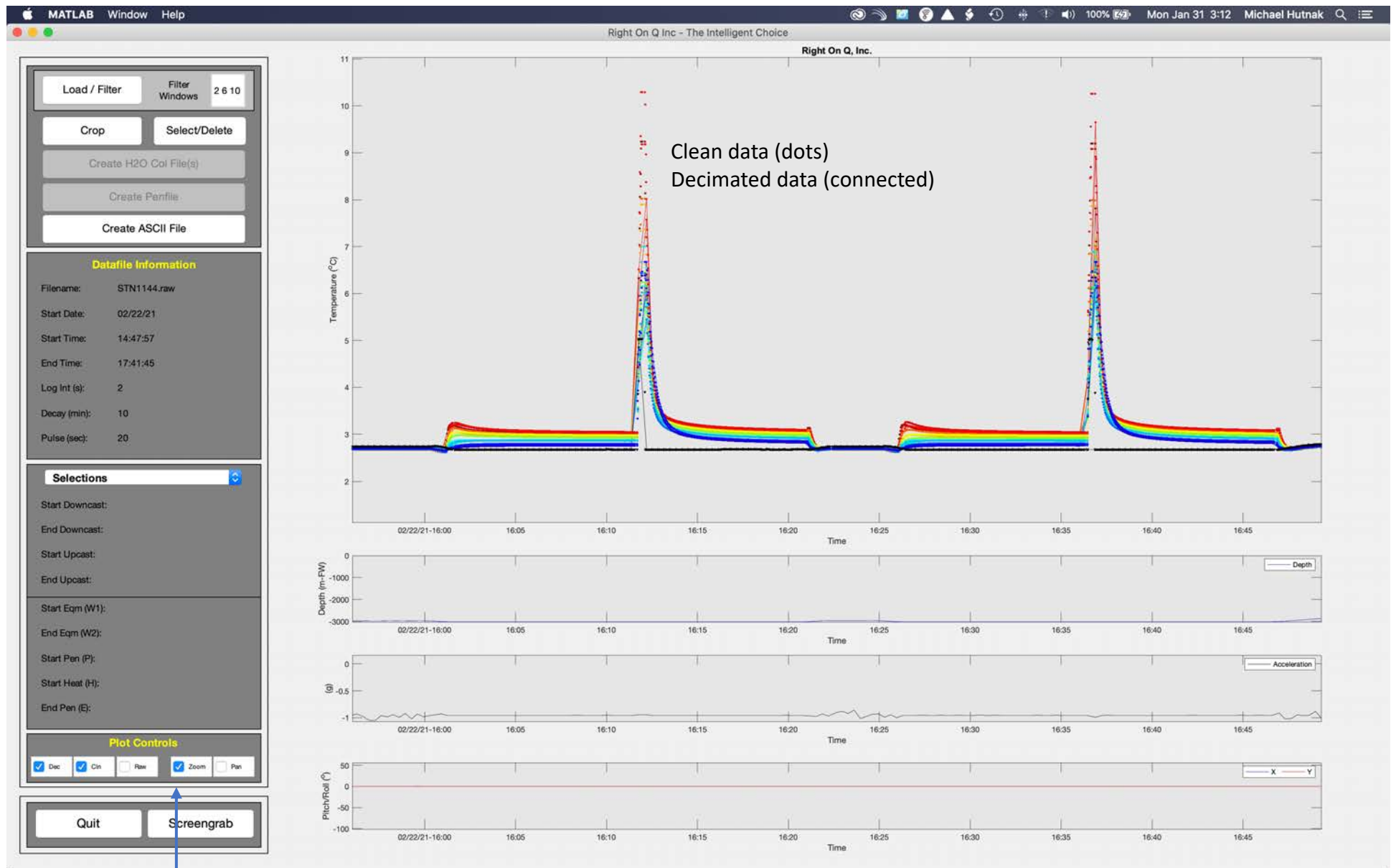
Files Created upon Loading:



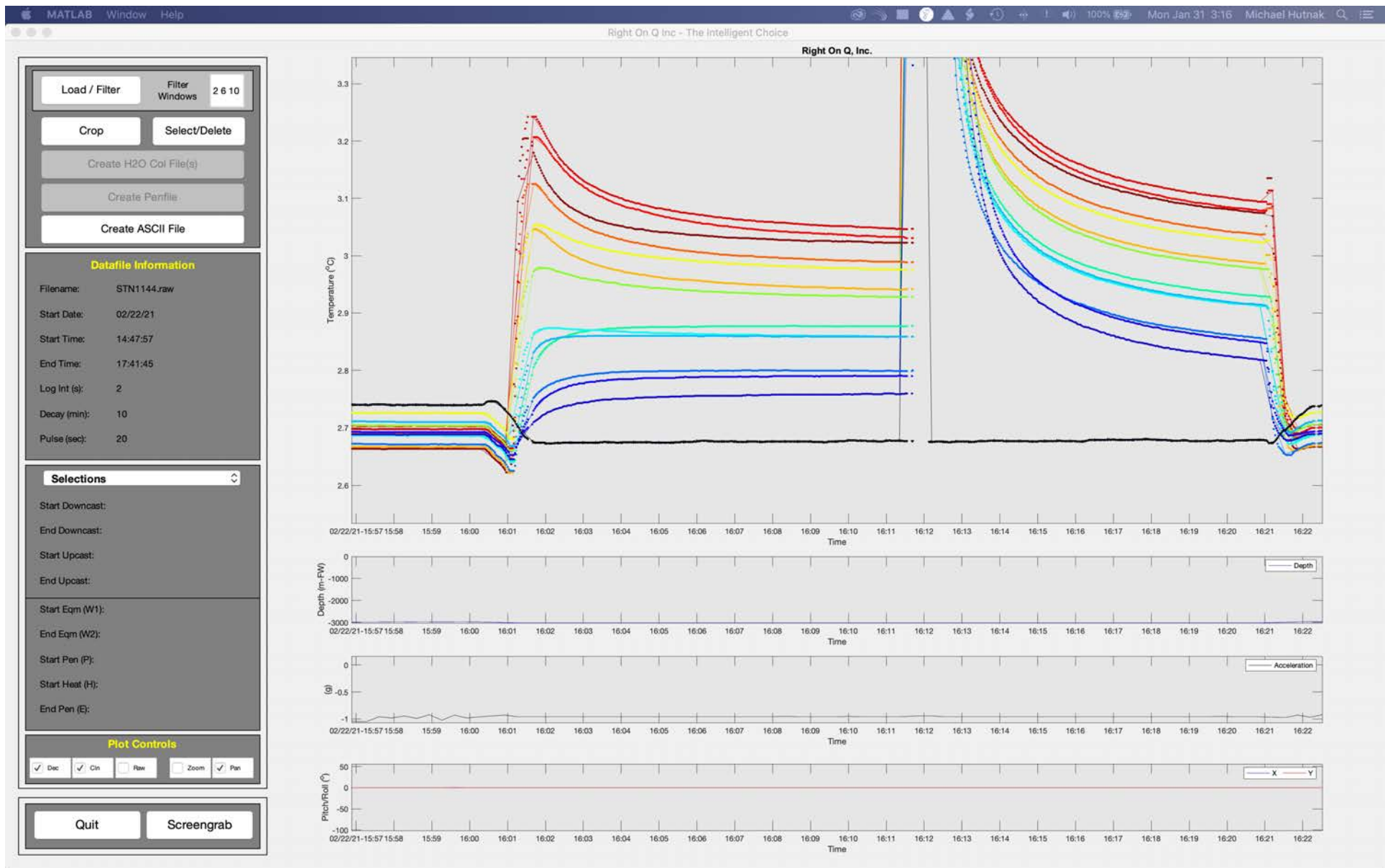
MAT file contains a single structure 'DATA', where the fields contain the actual data. More on 'raw', 'cln', and 'dec' – these stand for Raw (original as acquired), Clean (filtered with outliers removed), and Decimated (I use 10 seconds). More later...





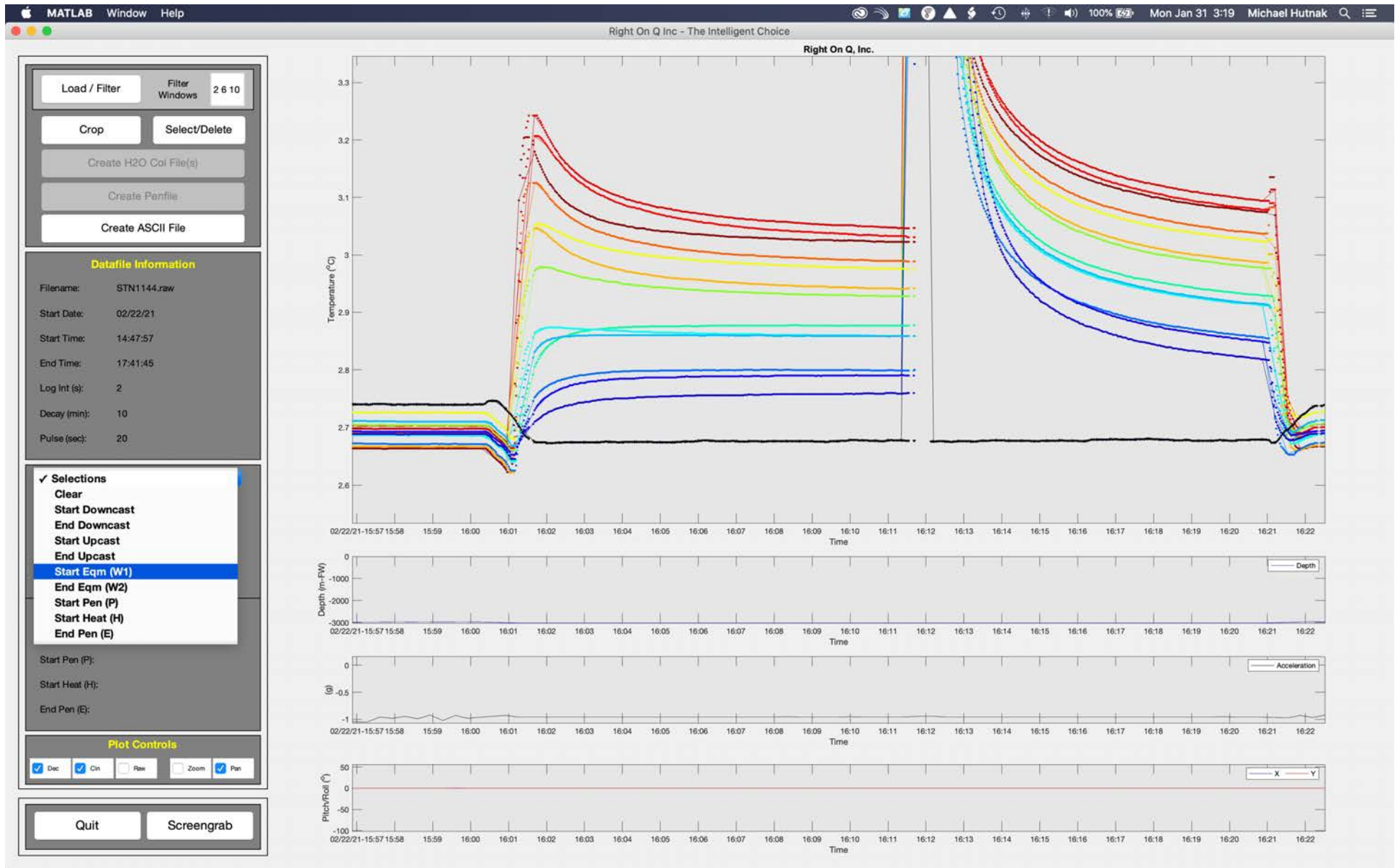


3. Toggle Zoom on, then drag a box around the heat flow pulse(s). Toggle Pan to move around.



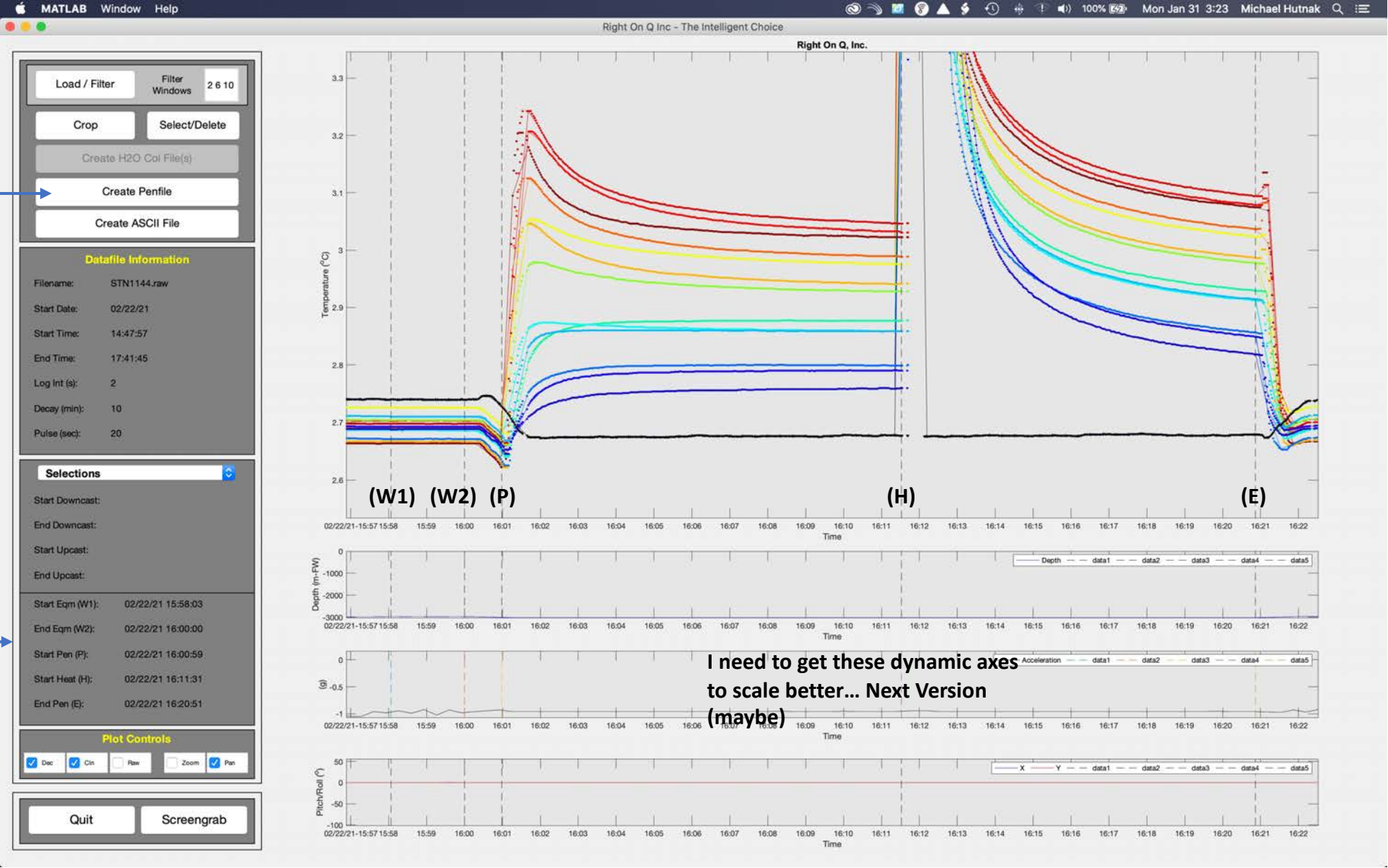
Zoomed in on a single heat flow penetration

4. Use dropdown menu.
This should look familiar. To create a traditional PEN file, you'll need start/end of equilibrium (W1/W2), start of Penetration (P), start of heat pulse (H), and end of Penetration (E).
Order doesn't matter.



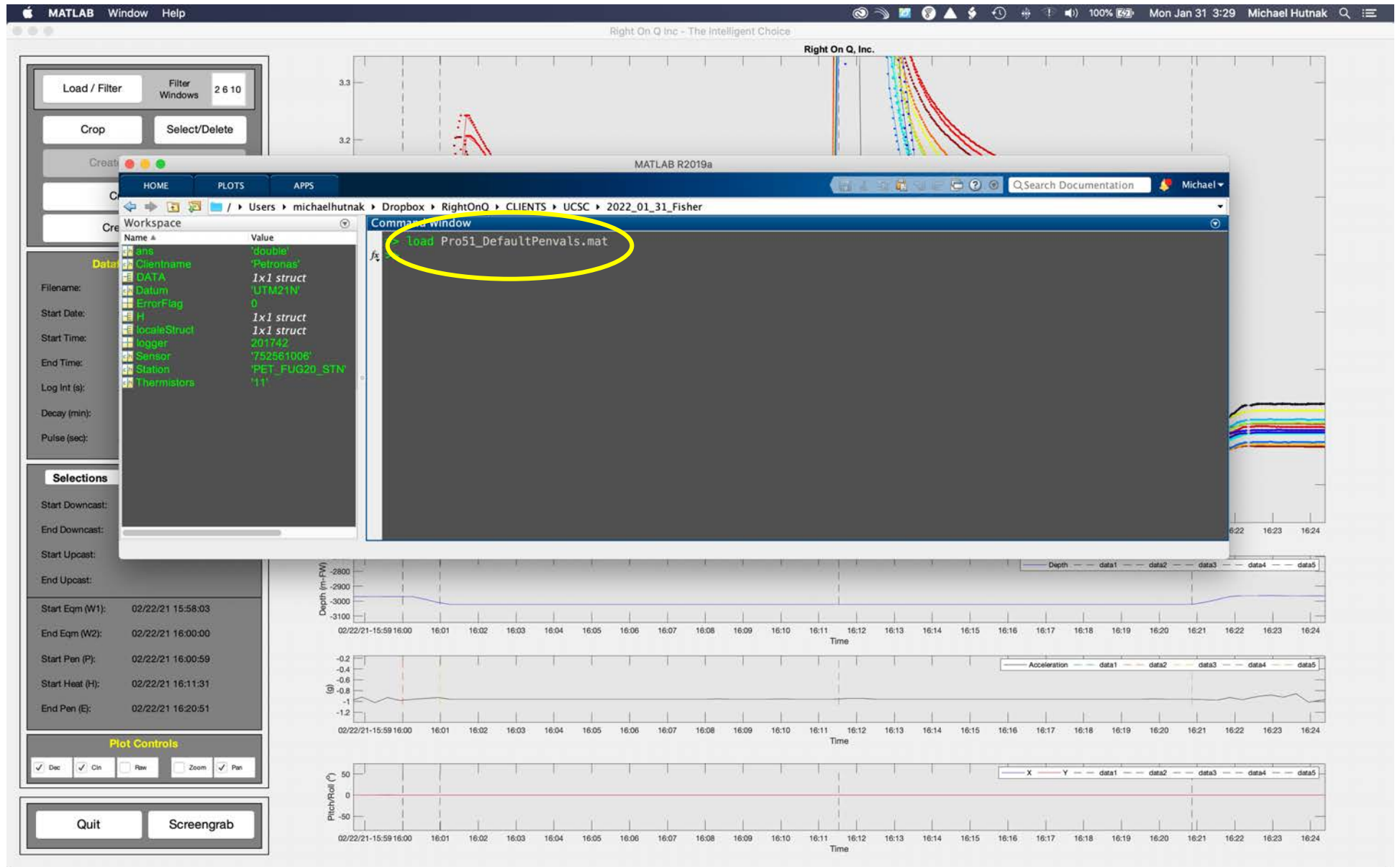
Button becomes active once all 5 values are chosen

Selections are shown here.



The file
“Pro51_DefaultPenVals.
mat” contains default
header data to be
written to the Pen File.

Edit for your application
and save. I usually set
this up first... doesn’t
matter when, though.



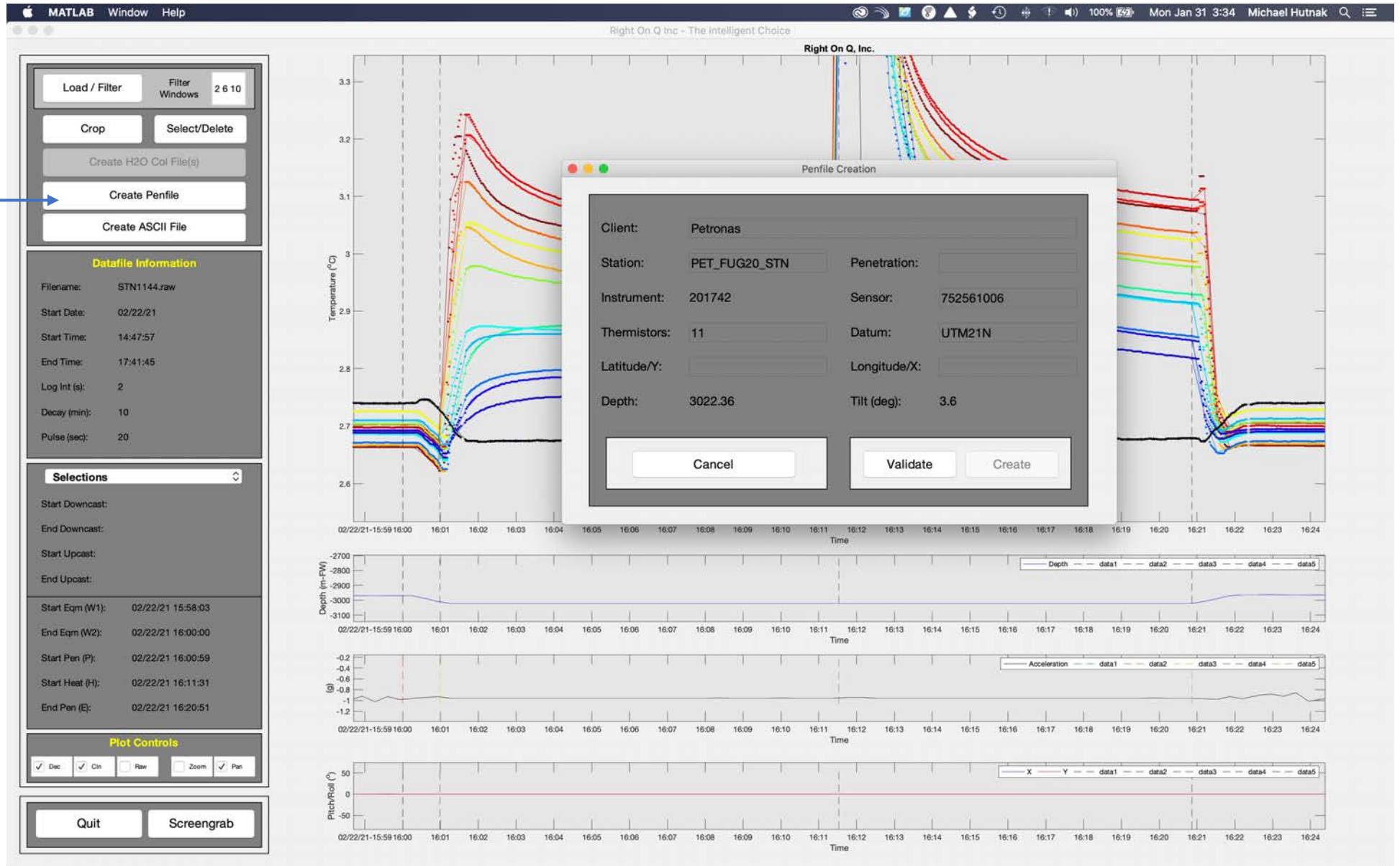
5. Select "Create Penfile".

A window opens showing defaults (previous slide).

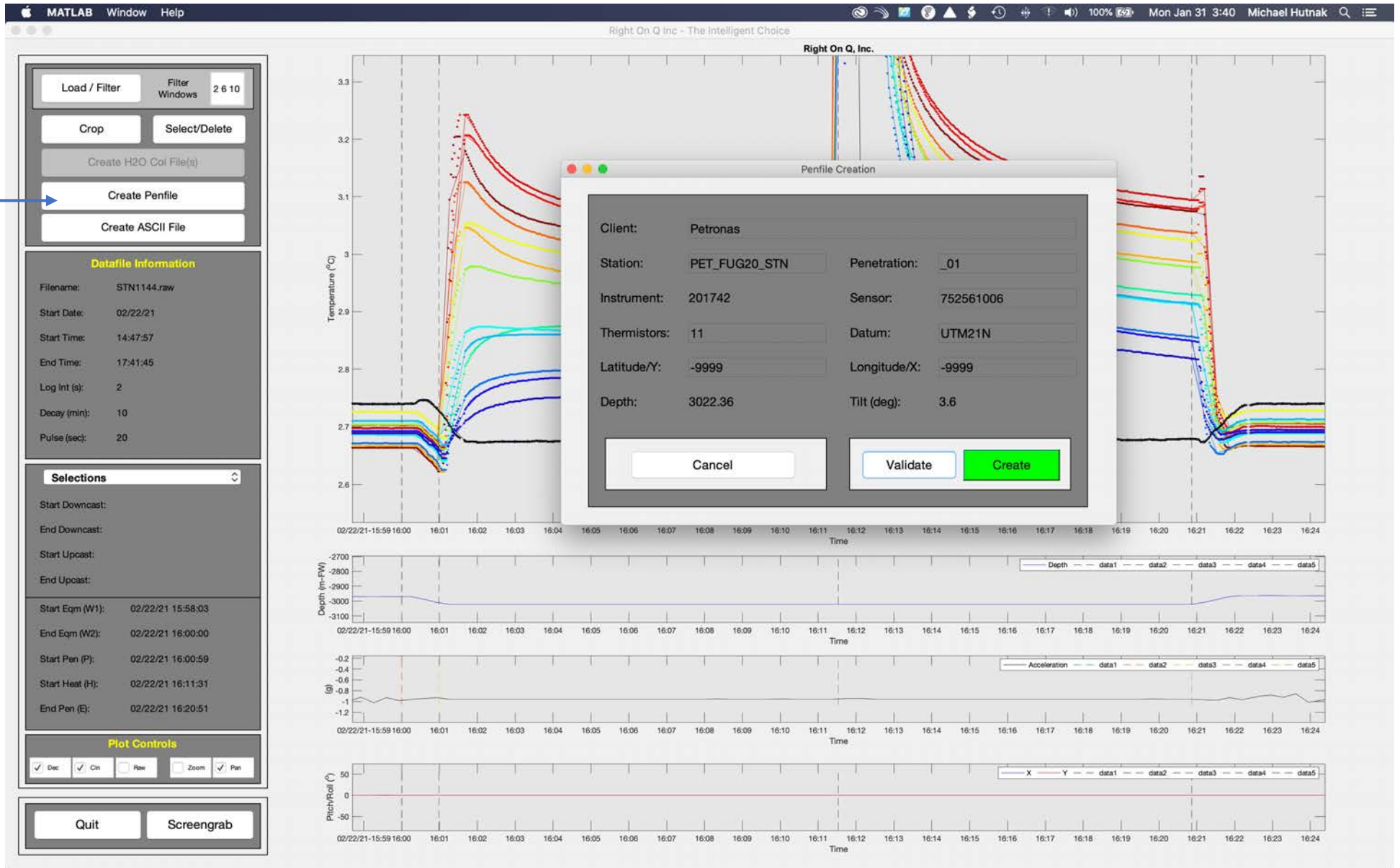
Add penetration number (integer or letter) and Lat/Lon.

You can put in dummy numbers for Lat/Lon and edit the penfile later (if you want).

See next slide for example.



6. Select "Validate"
Here I've put in a
Penetration number but
have dummy Lat/Lon.



Penfile and Tapfile

Note that in my Penfile, I blank out (NaN) the bottom water temperature during the pulse because there's a glitch in my electronics that causes a spike (looks bad).

