



# STRABOSPOT TEPHRA

USER GUIDE

v.1.3

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# INTRODUCTION

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## What is StraboSpot Tephra?

The StraboSpot Tephra collection is a set of templates developed to aid researchers in data collection, analysis and identification of tephra layers from the volcano to the ultradistal. These templates are intended to be comprehensive -- not all boxes need to be filled in, although adhering as closely as possible to the template is, of course, ideal. Although not all the information recorded may get published, it is important to record as much as possible so the data, analysis and interpretation workflow can be revisited later when other questions about the deposits may arise.

## Why StraboSpot?

There is no uniform mechanism to post or search digitally for SG&T data. Such data form perhaps the most basic dataset about the solid Earth, insofar as it captures that part of the Earth exposed to direct observation and is the fundamental ground truth against which all models of Earth development must be compared. In particular, in the past:

- There has been no digital Data System (acquisition and database) for SG&T data. Further, there is no widely accessible way to archive structure data digitally, with the result that structural data cannot be discovered or easily reused.
- A community effort to standardize data collection would result in a tremendous saving of time and provide a focus for the community to improve data collection and quality.
- The ability to make data available for download to all other interested researchers across disciplines would facilitate an improvement in the quality of science.
- Other fields of the Earth Sciences are at the similar stages of development for digital data.

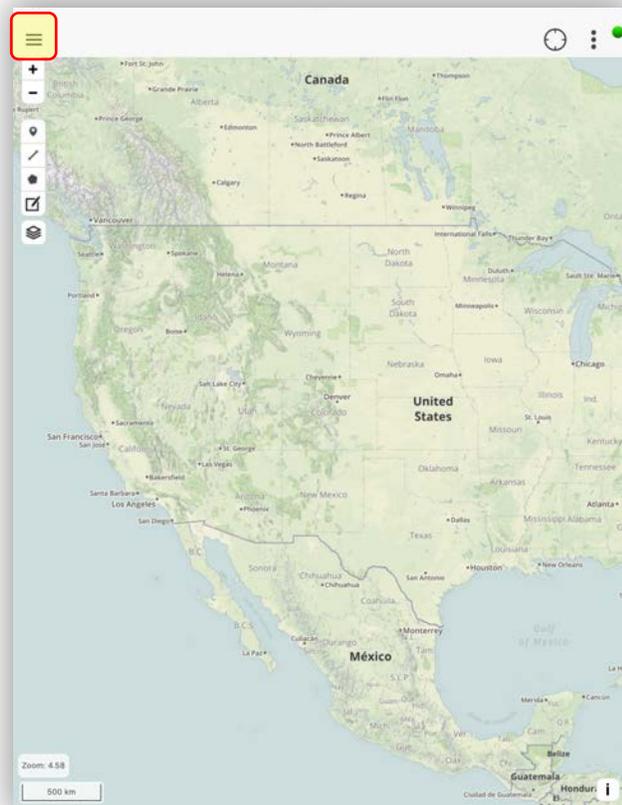
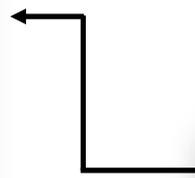
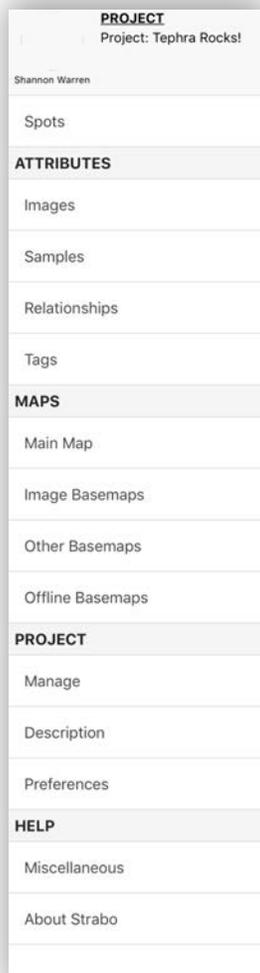
StraboSpot is being developed as an open source mobile app and web application to address these needs for the Earth Sciences. It is developed using NSF funding from the EAR and EarthCube programs.

# GETTING STARTED

## Logging In and the 3-Line Menu

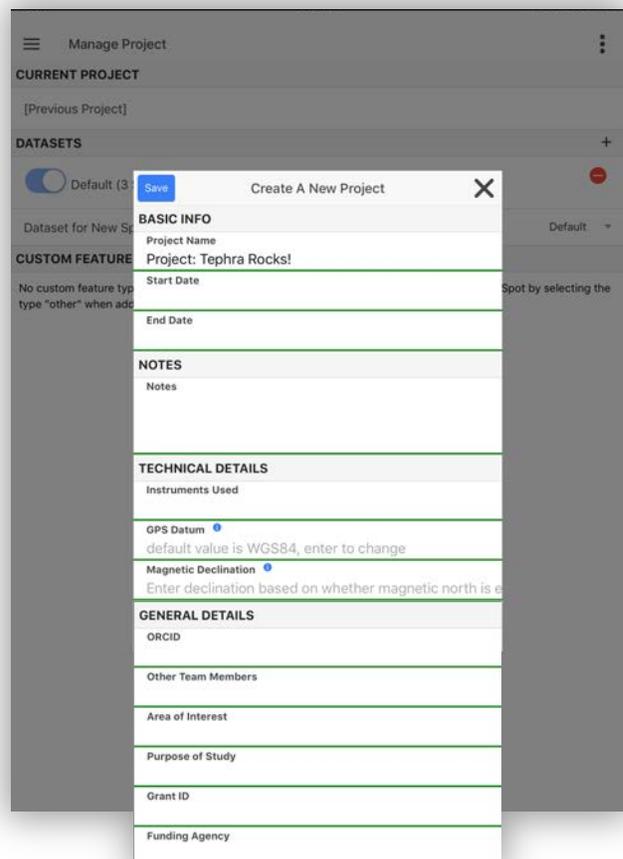
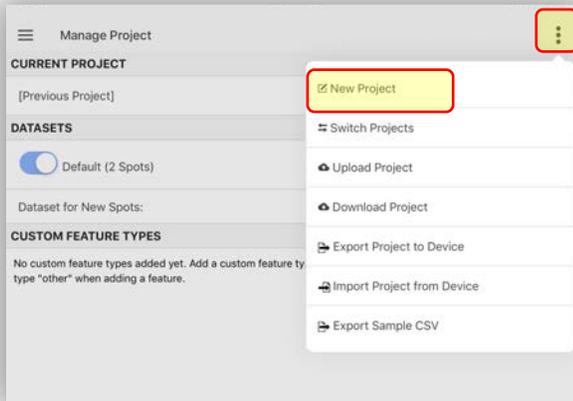
Open the StraboSpot application on your mobile device and sign in to your StraboSpot account (or create a new account).

From the main interface in Strabo, pressing the 3-Line Menu ☰ opens a menu of main header options: **ATTRIBUTES**, **MAPS**, **PROJECT**, and **HELP**. The subheadings under each main header under this menu will be used to record data and access various features in the StraboSpot app.



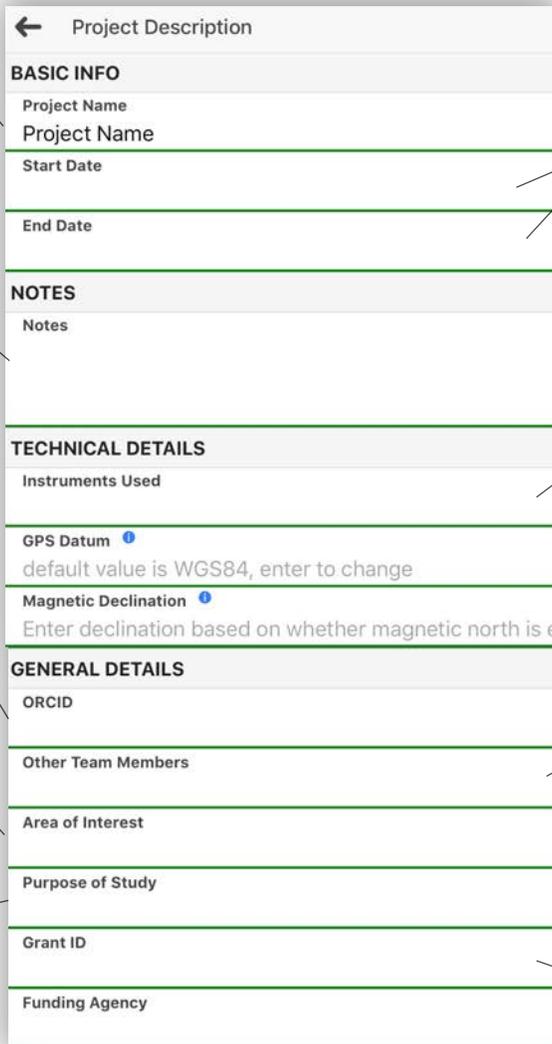
## Creating a New Project

Under the **PROJECT** header under the 3-line menu ☰, click on 'Manage', where a window of your current project details appears (if applicable). To create a new project, click on the 3-dot menu ⋮ in the top right corner of the screen interface; next, click on 'New Project'. A new window will appear which allows you to record your project details (refer to page 4 for further details on recording project information).



## Setting Up and Recording General Project Information

The ‘Create a New Project’ window provides fields which allows you to record your general project details and information, such as your Project Name (required), start/ end date, ORCID, Purpose of Study, Grant ID, Funding Agency, Notes, etc. TIP: it is recommended to record as much information about your project as deemed possible—this will help you in the future post-field work! Next, click the blue ‘Save’ button.



**Project Name**  
Record a unique name for your project. *This field is required.*

**Notes**  
Record any additional notes deemed necessary that are not recorded in other available fields

**ORCID**  
Enter project’s ORCID, if applicable

**Area of Interest**  
Describe geographic location of project

**Purpose of Study**  
Provide a short description of the purpose of your project/ study

**Funding Agency**  
List funding agency names of your project/ study

**Start/ End Date**  
Start and end date of data collection for your project

**Instruments Used**  
Describe the instruments used for your project

**Other Team Members**  
List project leader’s name, as well as other team members on your project

**Grant ID**  
List grant identification numbers

**Project Description**

**BASIC INFO**

Project Name

Project Name

Start Date

End Date

**NOTES**

Notes

**TECHNICAL DETAILS**

Instruments Used

GPS Datum ⓘ  
default value is WGS84, enter to change

Magnetic Declination ⓘ  
Enter declination based on whether magnetic north is e

**GENERAL DETAILS**

ORCID

Other Team Members

Area of Interest

Purpose of Study

Grant ID

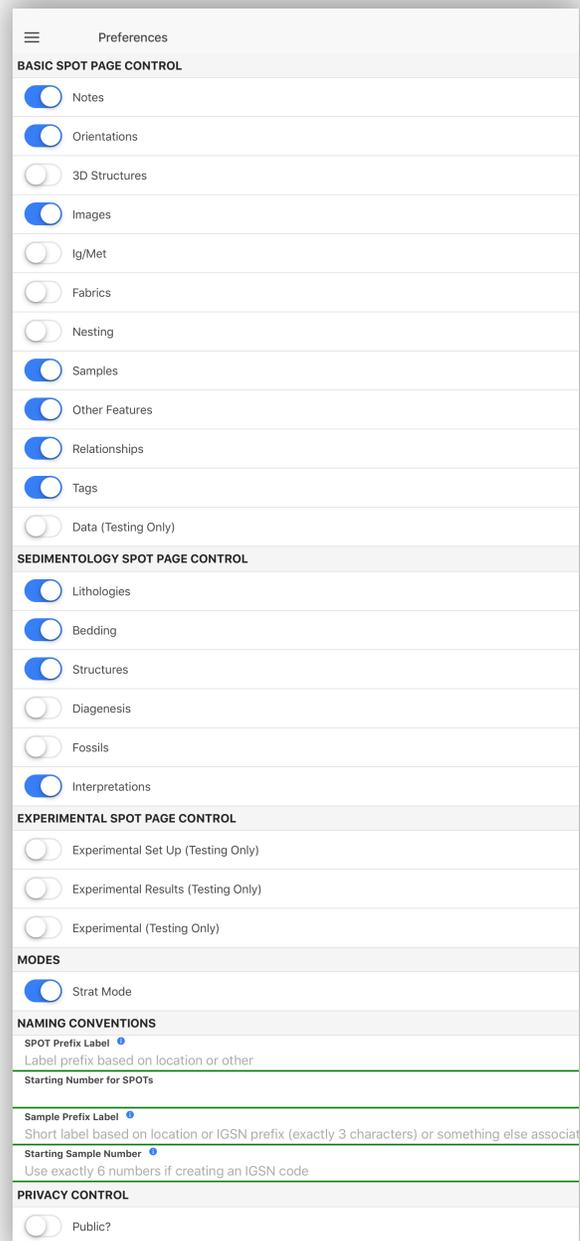
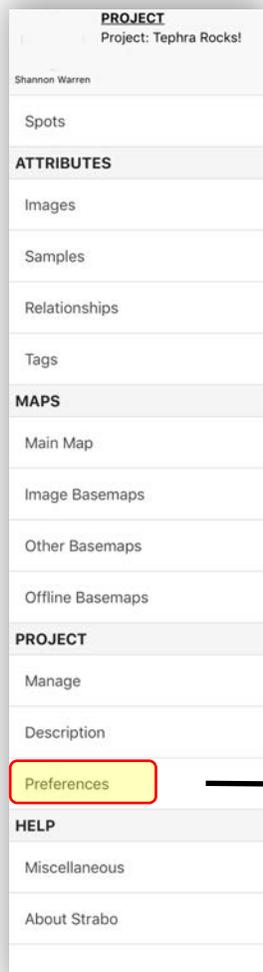
Funding Agency

## Turning on Tabs in 'Preferences' for Page Control

After creating a new project, open the 'Preferences' tab under the **PROJECT** header under the 3-line menu ☰. Here, you have the opportunity to customize your page control interface for data collection. Turn on tabs that you want access to while collecting data.

**IMPORTANT:**

For tephra work, Notes, Samples, Strat Mode, Lithologies, Bedding, Structures, and Interpretations *must* be turned on.



## ADDING 'SPOTS'

Spots allow you to add and record data to a specific location. Examples for creating a 'Spot' include eruption response sampling, tephra sampling and data collection, and setting up a subaerial or core station section.

To create a spot, first access the main map interface by clicking on 'Main Map' under the **MAPS** heading from the the 3-line menu ☰ button located at the top left of the screen). On the main map interface, a series of options are on the left side of the screen. To add a Spot, click on the 'Point' 📍 tool button, then click on the map at the desired location. TIP: pressing the 'GPS' 📶 tool located at the top right of the screen will locate your position on the map. After pinning a Spot to the map, a new window will appear that allows you to start adding data to this Spot location.



15851982643686

SPOT NOTES ORIENTATIONS 3D STRUCTURES IMAGES NESTING SAMPLES OTHER FEATURES RELATIONSHIP

Spot Name  
Collection Site 2

GEOGRAPHY

Set to My Location

Geometry

Point

Latitude	Longitude
3.76696	36.534413

GPS Accuracy (m)

Accuracy level of the latitude and longitude coordinates in meters.

Altitude (m)

Height of the position in meters above the ellipsoid of the earth.

Radius of Spot (m)

ROCK UNIT

+ Add/Remove a Geologic Unit (Tag)

NOTES

Notes about this Spot

OTHER

ID	15851982643686
Date	Mar 14, 2020
Time	11:51 PM

## SETTING UP A STATION

To set up a station site for describing and collecting tephra data in a stratigraphic interval/stratum or eruption response sampling at a specific location, add a Spot at your exact field location on your main map interface (refer to Page 5 for instructions on how to add Spots). **TIP: For each section you describe, you will need to create a new section at that location, including if you move along a section to a new location.** After a Spot is created, you will be prompted to record general information for your station site (a 'Spot' in Strabo).

### Station ID/ name of Sampling Station

Create a unique station name. Best practices include the year and sampler's initials

### Latitude/ Longitude

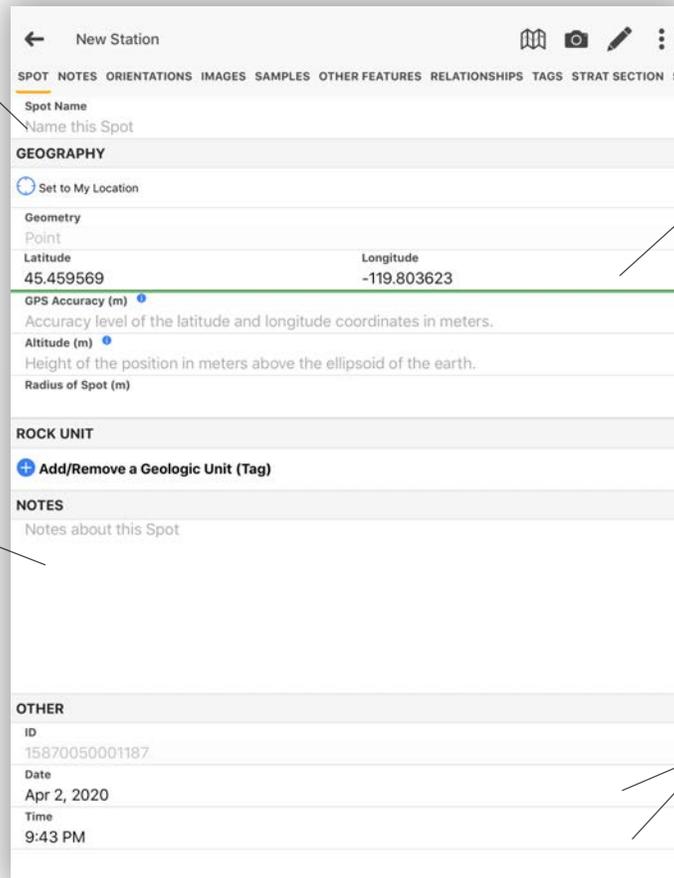
Exact location of station. Automatically recorded where Spot is located on the Main Map; can be manually recorded, if preferred or needed.

### Notes

Purpose of visiting station (e.g. proximal site, looking for a particular deposit, eruption response, tephra study); Permitting/permissions to work at this site; collect name/contact info, including PI's; explanation of how station is named; other station notes

### Date/ Time

StraboSpot automatically records this; however, you can manually input it if needed



**SPOT NAME**  
Spot Name  
Name this Spot

**GEOGRAPHY**  
Set to My Location  
Geometry  
Point  
Latitude 45.459569 Longitude -119.803623  
GPS Accuracy (m)  
Accuracy level of the latitude and longitude coordinates in meters.  
Altitude (m)  
Height of the position in meters above the ellipsoid of the earth.  
Radius of Spot (m)

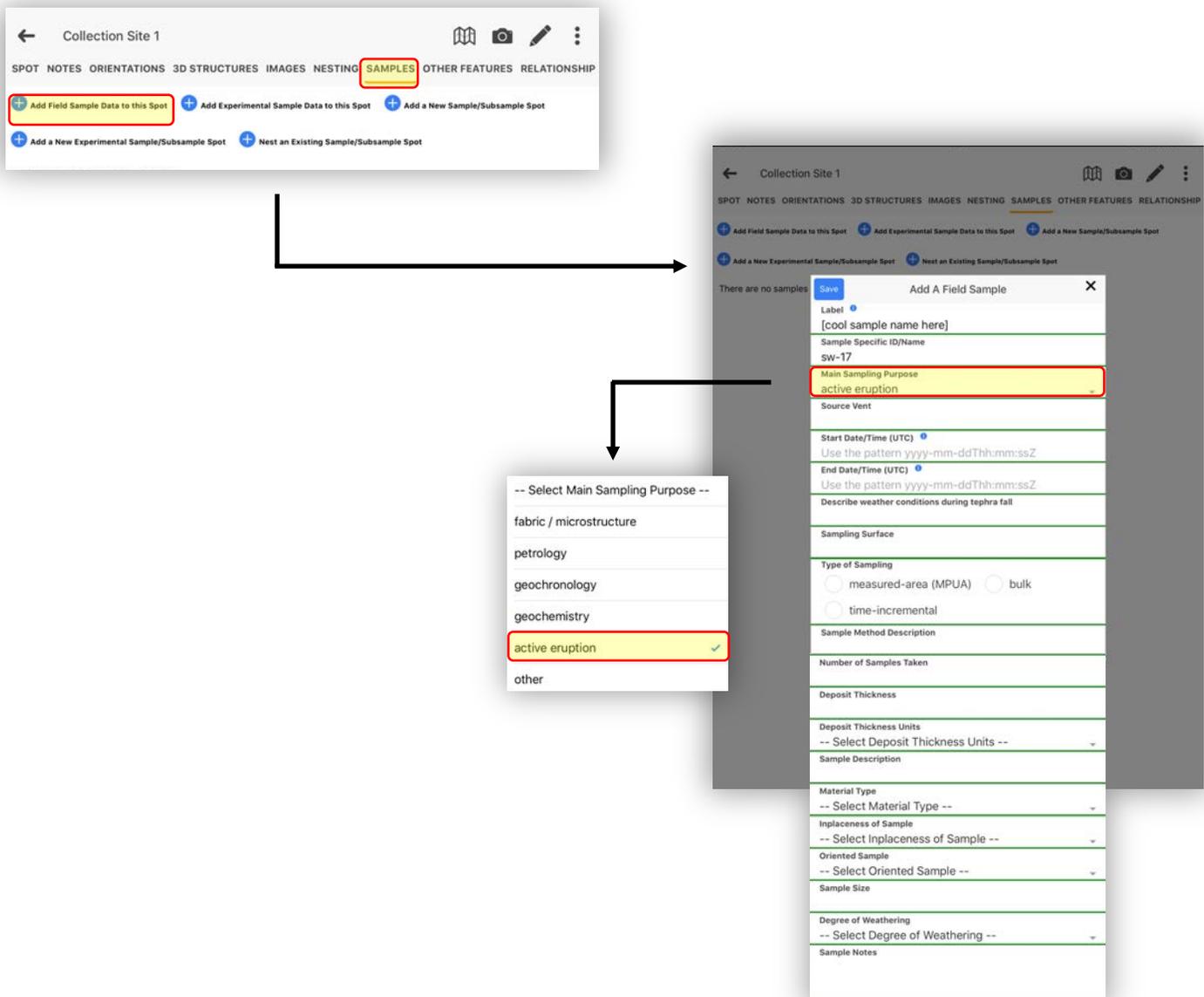
**ROCK UNIT**  
Add/Remove a Geologic Unit (Tag)

**NOTES**  
Notes about this Spot

**OTHER**  
ID 15870050001187  
Date Apr 2, 2020  
Time 9:43 PM

## ERUPTION RESPONSE SAMPLING

To record tephra data for Eruption Response Sampling, first create a Spot at your Station Site (refer to page 6 for directions on how to add a Station Site). Click on the ‘Samples’ heading option located at the top of the Spot window. Here, you can choose from a variety of different sample types. Click on your desired Sample type to open a Sample data window. From here, name Sample under the ‘Label’ text field, as well as a ‘Sample Specific ID/Name’. Under the ‘Main Sampling Purpose’ drop menu, choose ‘active eruption’. This will provide a series of text fields to record your tephra sample data, such as Source Vent, start/end date/time, description of weather conditions during tephra fall, Sampling Surface, Type of Sampling (MPUA, bulk, time-incremental), additional Sample Notes, etc. (see page 7).



The image shows a sequence of three screenshots from a mobile application. The first screenshot shows the 'Collection Site 1' screen with a menu at the top. The 'SAMPLES' option is highlighted with a red box. Below the menu, there are four buttons: 'Add Field Sample Data to this Spot', 'Add Experimental Sample Data to this Spot', 'Add a New Sample/Subsample Spot', and 'Add a New Experimental Sample/Subsample Spot'. The second screenshot shows the 'Add A Field Sample' form. The 'Main Sampling Purpose' dropdown menu is highlighted with a red box and shows a list of options. The third screenshot shows the dropdown menu expanded, with 'active eruption' selected and marked with a checkmark.

Collection Site 1

SPOT NOTES ORIENTATIONS 3D STRUCTURES IMAGES NESTING **SAMPLES** OTHER FEATURES RELATIONSHIP

+ Add Field Sample Data to this Spot + Add Experimental Sample Data to this Spot + Add a New Sample/Subsample Spot

+ Add a New Experimental Sample/Subsample Spot + Nest an Existing Sample/Subsample Spot

Collection Site 1

SPOT NOTES ORIENTATIONS 3D STRUCTURES IMAGES NESTING **SAMPLES** OTHER FEATURES RELATIONSHIP

+ Add Field Sample Data to this Spot + Add Experimental Sample Data to this Spot + Add a New Sample/Subsample Spot

+ Add a New Experimental Sample/Subsample Spot + Nest an Existing Sample/Subsample Spot

There are no samples

Save Add A Field Sample X

Label [cool sample name here]

Sample Specific ID/Name SW-17

Main Sampling Purpose active eruption

Source Vent

Start Date/Time (UTC) Use the pattern yyyy-mm-ddThh:mm:ssZ

End Date/Time (UTC) Use the pattern yyyy-mm-ddThh:mm:ssZ

Describe weather conditions during tephra fall

Sampling Surface

Type of Sampling

measured-area (MPUA)  bulk

time-incremental

Sample Method Description

Number of Samples Taken

Deposit Thickness

Deposit Thickness Units -- Select Deposit Thickness Units --

Sample Description

Material Type -- Select Material Type --

Inplaceness of Sample -- Select Inplaceness of Sample --

Oriented Sample -- Select Oriented Sample --

Sample Size

Degree of Weathering -- Select Degree of Weathering --

Sample Notes

-- Select Main Sampling Purpose --

fabric / microstructure

petrology

geochronology

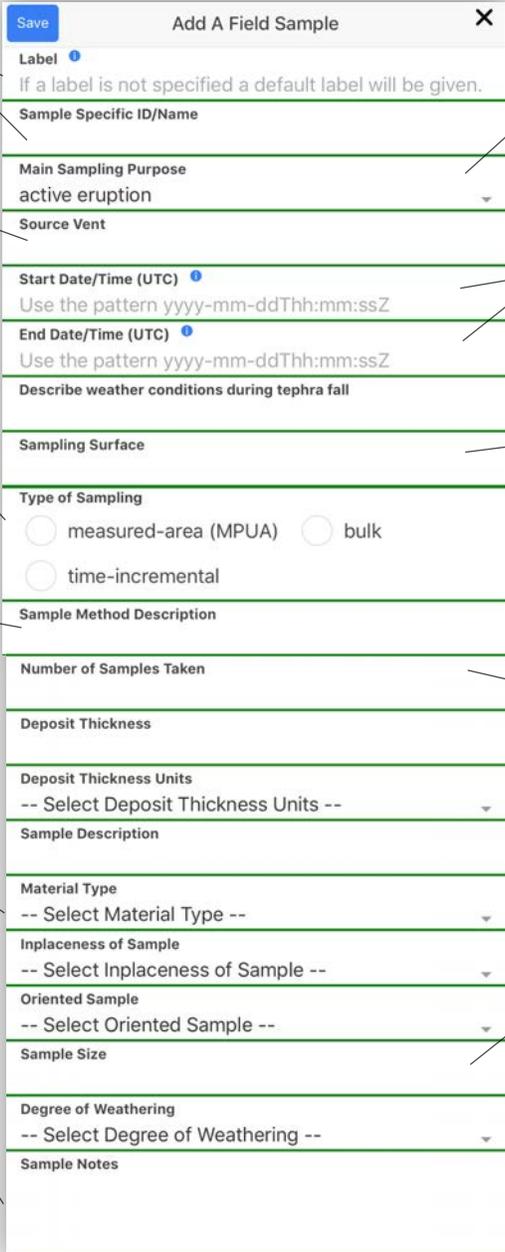
geochemistry

active eruption ✓

other

## Recording Data for Eruption Response Sampling

Record as much data as deemed possible here for each sample collected! After you have recorded your data for a sample, press the blue 'Save' button. TIP: if needed, you can always go back and edit a Sample. Continue recording additional Samples to this site location or go back to the Main Map to create a new Spot/ Station Site.



**Label and Sample Specific ID/ Name**  
Record a label for your sample as well as the specific ID or name associated with your collected sample

**Source Vent**  
Give volcano name of associated vent

**Type of Sampling**  
Select from list; if MPUA, area of surface sampled (m<sup>2</sup>) and mass (g) of sample fields will be recorded in new available fields

**Sample Method Description**  
Describe details of your sampling method

**Material Type**  
Select sample material type from available options from, or select describe if 'other'

**Sample Notes**  
Add any additional notes and descriptions of sample collected.

**Main Sampling Purpose**  
For Eruption Response Sampling, 'active eruption' must be selected in this field

**Start/ End Date/ Time**  
Record the start and end time of eruption event. This must be manually recorded. Example: 2020-03-20 13:10:54

**Sampling Surface**  
Describe the surface upon which sampling is taken from (e.g. clean tarp, vehicle windshield, snow, stairs, etc.)

**Number of Samples Taken**  
Describe how many individual samples you collected under this sample ID/ Name

**Sample Size**  
Qualitative or quantitative description of size of sample(s) collected

**Form Fields:**  
 Save Add A Field Sample X  
 Label (blue dot)  
 If a label is not specified a default label will be given.  
 Sample Specific ID/Name  
 Main Sampling Purpose active eruption  
 Source Vent  
 Start Date/Time (UTC) (blue dot) Use the pattern yyyy-mm-ddThh:mm:ssZ  
 End Date/Time (UTC) (blue dot) Use the pattern yyyy-mm-ddThh:mm:ssZ  
 Describe weather conditions during tephra fall  
 Sampling Surface  
 Type of Sampling  
 measured-area (MPUA)  bulk  
 time-incremental  
 Sample Method Description  
 Number of Samples Taken  
 Deposit Thickness  
 Deposit Thickness Units -- Select Deposit Thickness Units --  
 Sample Description  
 Material Type -- Select Material Type --  
 Inplaceness of Sample -- Select Inplaceness of Sample --  
 Oriented Sample -- Select Oriented Sample --  
 Sample Size  
 Degree of Weathering -- Select Degree of Weathering --  
 Sample Notes

# TEPHRA FIELD SAMPLING AND DATA COLLECTION

Once you create a 'Spot' to collect field samples at a specific location (refer to Pages 6 and 7), you can start collecting samples and recording sample data in StraboSpot. The following screen examples highlight key components in StraboSpot to record tephra-related data for field collection and/ or describing tephra strata within a stratigraphic section. As always, record as much information as deemed necessary and possible for each location and sample collected. Do this by navigating through the tabs and going through each field and record associated necessary data. To add more tephra collection sites at new locations, add another 'Spot' (explained on Page 6 and 7). Refer to Pages 16-21 for directions on how to create a stratigraphic section in Strabo and record collected samples in an interval or specific location in a section.

## SED LITHOLOGIES – Lithology

**Volcaniclastic Type**  
Select the volcaniclastic type of deposit

**Componentry**  
Select main components, particle/ clast types within deposit

**Evidence of deposit alteration**  
Describe evidence of strata alteration (e.g. soft easily crushed pumice; coatings, strong alteration colors – e.g. carbonate or amorphous silica in soils – these can compromise attempts at bulk geochemistry)

**Color**  
Describe fresh and weathered color of deposit and note whether it is wet/ dry/ both

The screenshot shows a mobile application interface for recording sediment lithology. The top navigation bar includes 'OTHER FEATURES', 'RELATIONSHIPS', 'TAGS', 'SED INTERVAL', 'SED LITHOLOGIES', 'SED BEDDING', and 'SED STRUCTURES'. The current screen is titled 'Lithology' and shows 'Lithology 1' selected. The form is divided into several sections:

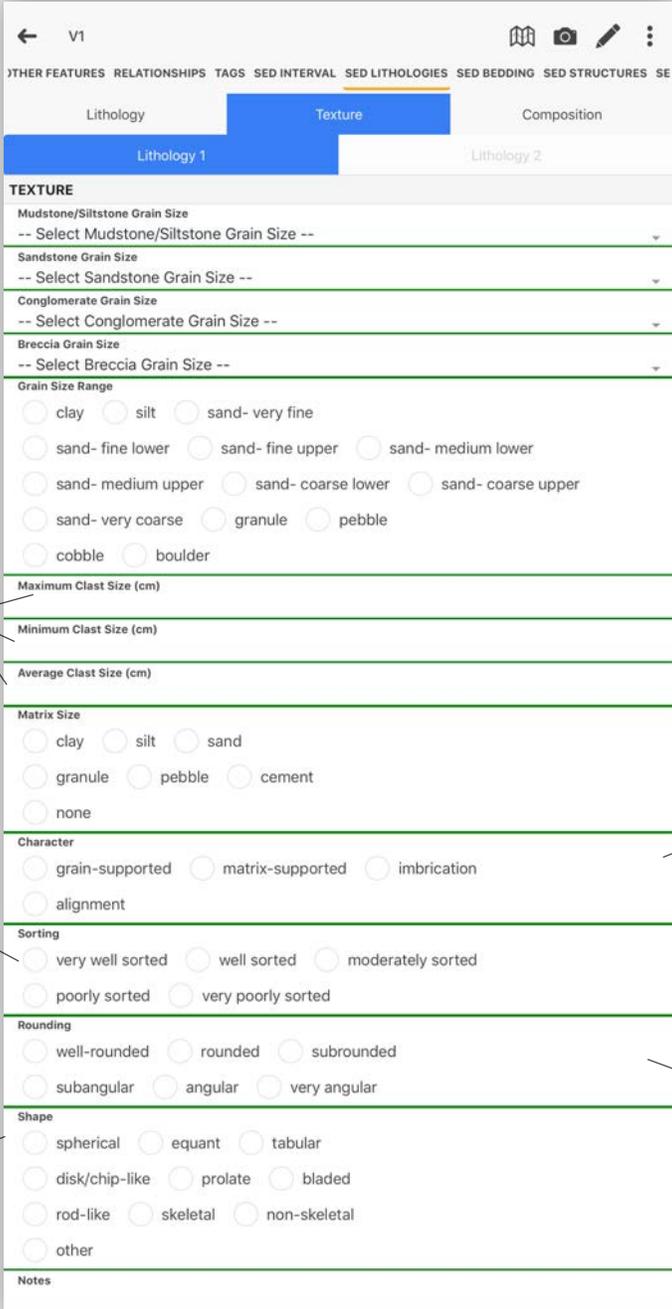
- PRIMARY LITHOLOGY**: Primary Lithology is set to 'volcaniclastic'. Under 'Volcaniclastic type', there are radio buttons for volcanic mudstone, volcanic sandstone, lapillistone, agglomerate, volcanic breccia, bentonite, tuff, welded tuff, ignimbrite, and other.
- Report presence of particle aggregates**: A checkbox field.
- Componentry**: Radio buttons for pumice, accidental lithic, accessory lithic, glass/obsidian, crystals, and accretionary lapilli.
- Approximate relative abundances of clasts**: A text input field.
- LITHIFICATION & COLOR**: Includes dropdowns for 'Relative resistance (weathering profile)', 'Lithification', and 'Evidence of deposit alteration'. Below are fields for 'Evidence of clast alteration', 'Fresh Color', and 'Weathered Color'.
- Color Appearance**: Radio buttons for uniform, patchy, striped, mottled, spotted, gradational, and other.
- Notes**: A text area at the bottom for additional observations.

**Report presence of particle aggregates**  
Text explanation describing aggregates (e.g. accretionary lapilli, ash coated pumice, lithics, etc.) including average size range and units

**Approximate relative abundances of clasts**  
Estimate and explanation of percentage of clasts in deposit

**Evidence of clast alteration**  
Describe evidence of clast alteration (e.g. soft easily crushed pumice; coatings; etc.)

## SED LITHOLOGIES – Texture



← V1

OTHER FEATURES RELATIONSHIPS TAGS SED INTERVAL SED LITHOLOGIES SED BEDDING SED STRUCTURES SE

Lithology Texture Composition

Lithology 1 Lithology 2

**TEXTURE**

Mudstone/Siltstone Grain Size  
-- Select Mudstone/Siltstone Grain Size --

Sandstone Grain Size  
-- Select Sandstone Grain Size --

Conglomerate Grain Size  
-- Select Conglomerate Grain Size --

Breccia Grain Size  
-- Select Breccia Grain Size --

Grain Size Range

clay  silt  sand- very fine

sand- fine lower  sand- fine upper  sand- medium lower

sand- medium upper  sand- coarse lower  sand- coarse upper

sand- very coarse  granule  pebble

cobble  boulder

Maximum Clast Size (cm)

Minimum Clast Size (cm)

Average Clast Size (cm)

Matrix Size

clay  silt  sand

granule  pebble  cement

none

Character

grain-supported  matrix-supported  imbrication

alignment

Sorting

very well sorted  well sorted  moderately sorted

poorly sorted  very poorly sorted

Rounding

well-rounded  rounded  subrounded

subangular  angular  very angular

Shape

spherical  equant  tabular

disk/chip-like  prolate  bladed

rod-like  skeletal  non-skeletal

other

Notes

**Min./ Max./ Average Clast Size**

Note and record the minimum, maximum, and average size of clasts (cm)

**Sorting**

Select observed sorting character of the deposit

**Clast Shapes Within Strata**

Select observed clast shapes; if other, describe in the following given field.

**Matrix- or Clast-Supported**

Select whether the deposit is matrix- or clast- supported

**Angularity of Clasts**

Select the type of angularity of clasts; further detail can be reported in 'Notes' below



# SED LITHOLOGIES – Composition

← V1

OTHER FEATURES RELATIONSHIPS TAGS SED INTERVAL SED LITHOLOGIES SED BEDDING SED STRUCTURES SE

Lithology Texture **Composition**

Lithology 1 Lithology 2

**COMPOSITION**

**Minerals Present**

quartz  mica  glauconite

feldspar  clay  lithics

rip-up clasts  heavy minerals  pyrite

gypsum  halite  chert

hematite  limonite  goethite

magnetite  calcite  dolomite

aragonite  siderite  ankerite

apatite  zeolites  organics

coalified wood  illite  bentonite

smectite  chlorite  kaolinite

other

---

**Dott Classification**

quartz arenite  feldspathic arenite  subarkose arenite

lithic arenite  sublitharenite  quartz wacke

lithic wacke  feldspathic wacke

---

**Folk/McBride Classification**

quartzarenite  subarkose  sublitharenite

arkose  lithic arkose  arkosic litharenite

litharenite

---

**Matrix composition**

intrusive igneous  volcanic  metamorphic

mudstone  siltstone  sandstone

conglomerate  carbonate  other

---

**Volcaniclastic type**

glass  crystals  lithic fragments

volcanic mudstone  volcanic sandstone  lapillistone

agglomerate  volcanic breccia  bentonite

tuff  welded tuff  ignimbrite

discrete  disseminated  cryptotephra

other

---

**Evaporite type**

gypsum - anhydrite primary  gypsum - anhydrite diagenetic  halite - primary

halite - diagenetic

---

**Phosphorite type**

nodular  bedded  massive

---

**Organic/Coal Lithologies**

amber  peat  lignite

subbituminous  bituminous  coal ball

tar

---

**Notes**

**Discrete/  
Disseminated/ Crypto**  
Select from list  
volcaniclastic type,  
including whether the  
deposit is discrete,  
disseminated, or  
cryptotephra

## SED BEDDING

### Bed Geometry

Select from list that describes the physical continuity of the stratigraphic interval along the outcrop; can add further detail in 'Notes' below (e.g. pinches in/ out, pinches from 1-6 cm, etc.)

### UPPER CONTACT

Enter and record the shape and character of the stratigraphic interval's upper contact; further text description may be recorded in 'Notes' below



← V1

HER FEATURES RELATIONSHIPS TAGS SED INTERVAL SED LITHOLOGIES **SED BEDDING** SED STRUCTURES SED I

Lithology 1 Lithology 2

**Bed Geometry**

discontinuous  tabular/parallel  lenticular

wedge  channel-like

---

**LOWER CONTACT**

Shape of lower contact (if variable, select more than one)

flat  undulatory  curved

concave up  concave down  irregular

covered

Character of lower contact(s) (if variable, select more than one)

sharp  gradational  well-defined

poorly-defined

Lower contact relief

---

**UPPER CONTACT**

Shape of upper contact (if variable, select more than one)

flat  undulatory  curved

concave up  concave down  irregular

covered

Character of upper contact (if variable, select more than one)

sharp  gradational  well-defined

poorly-defined

Upper Contact Relief

---

**INTERBED THICKNESS**

Average Thickness

Maximum Thickness

Minimum Thickness

Interbed Thickness Units

m

Notes

### LOWER CONTACT

Enter and record the shape and character of the stratigraphic interval's lower contact; further text description may be recorded in 'Notes' below

# SED STRUCTURES – Physical

**Internal Bedding**  
Select, note, and describe any internal bedding features of interval

V1

PHYS TAGS SED INTERVAL SED LITHOLOGIES SED BEDDING **SED STRUCTURES** SED INTERPRETATIONS MORE

Physical Bioturbation Bedding Plane Pedogenic

Lithology 1 Lithology 2

Massive/Structureless?  
-- Select Massive/Structureless? --

**CROSS BEDDING**

Cross Bedding Type

cross bedding (general)  trough  hummocky-swaley

swaley  planar tabular  festoon

wedge  low angle  high angle

symmetric  asymmetric  herringbone

bi-directional  sigmoidal  pinstripe

avalanche tongues  large scale  carbonaceous drapes

mud drape  other

Cross Bedding Height (cm)

Cross Bedding Width (cm)

Cross Bedding Thickness (cm)

Cross Bedding Spacing (cm)

**RIPPLE LAMINATION**

Ripple Lamination Type

cross lamination (general)  trough  climbing

flaser  wavy  lenticular

translent  starved  herringbone

bi-directional  pinstripe  wind

interference  carbonaceous drape  mud drape

other

Ripple Lamination Height (mm)

Ripple Lamination Width (mm)

Ripple Lamination Thickness (mm)

Ripple Lamination Spacing (mm)

**HORIZONTAL BEDDING**

Horizontal Bedding Type

horizontal  planar  rhythmic

wavy  lenticular  carbonaceous drape

mud drape  sandy stringers  other

**GRADED BEDDING**

Graded Bedding Type  
-- Select Graded Bedding Type --

**DEFORMATION STRUCTURES**

Deformation Structure Type

contorted bedding  convolute bedding  rip-up clasts

nodular bedding  pipes  dikes

sills  dish structures  flame structures

sand/mud volcanoes  load structures  ball and pillow

boudinage  intrastratal cracks  liquefaction features

syn-sedimentary faults  Neptunian dikes  post-lithification deformational str

other

**LAGS**

Lag Type

lag deposit  rip-up clasts  intraclasts

other

Clast Composition

Clast Size

Layer Thickness/Shape

**OTHER COMMON STRUCTURES**

Other Common Structure Type

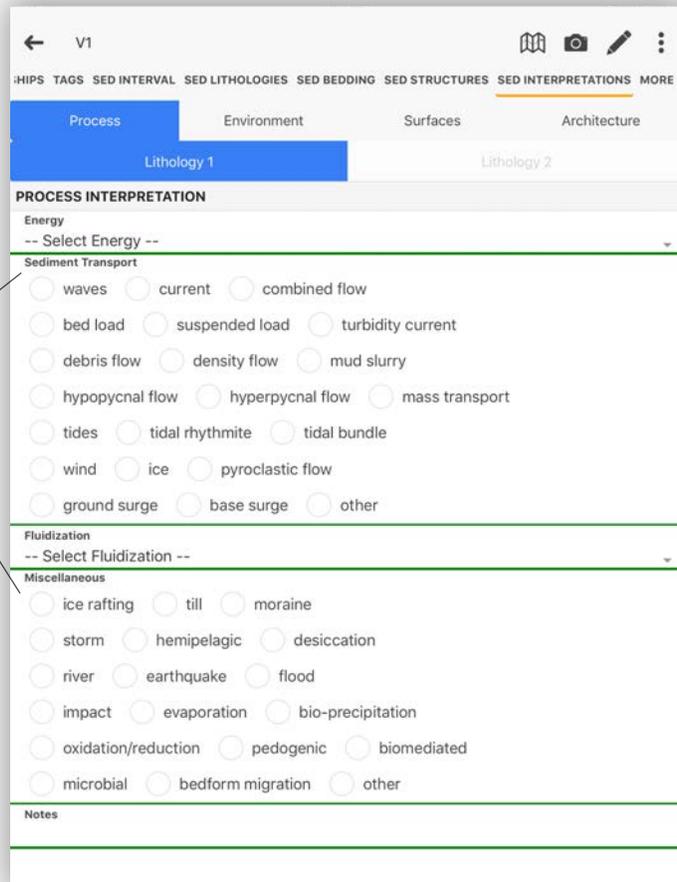
Bouma Sequence  Tidal Bundles

Notes

**Graded Bedding**  
Select type of grading present in the deposit; further text description should be added in 'Notes' below

## SED INTERPRETATIONS – Process

**Evidence of Reworking**  
 Note and select any evidence of reworking. Further text description can be recorded in 'Notes' below.



← V1

BOOKMARKS CAMERA EDITOR MENU

CHIPS TAGS SED INTERVAL SED LITHOLOGIES SED BEDDING SED STRUCTURES **SED INTERPRETATIONS** MORE

Process Environment Surfaces Architecture

Lithology 1 Lithology 2

**PROCESS INTERPRETATION**

Energy  
 -- Select Energy --

Sediment Transport

waves  current  combined flow

bed load  suspended load  turbidity current

debris flow  density flow  mud slurry

hypopycnal flow  hyperpycnal flow  mass transport

tides  tidal rhythmite  tidal bundle

wind  ice  pyroclastic flow

ground surge  base surge  other

Fluidization  
 -- Select Fluidization --

Miscellaneous

ice rafting  till  moraine

storm  hemipelagic  desiccation

river  earthquake  flood

impact  evaporation  bio-precipitation

oxidation/reduction  pedogenic  biomediated

microbial  bedform migration  other

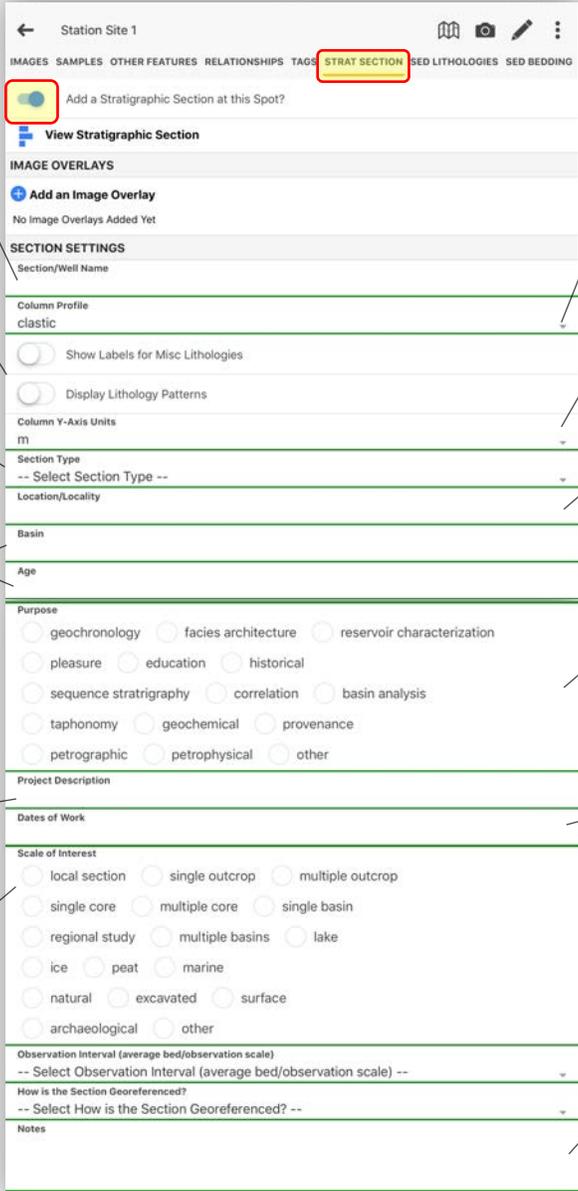
Notes

# SETTING UP A STRATIGRAPHIC SECTION

The StraboSpot application also features utilizing creating a stratigraphic section and recording data through each stratum or stratigraphic interval described. The following describes how to create and set up a subaerial and core station section.

## Setting Up a Subaerial Station Section

After creating a 'Spot' instructed on Page 6 and 7, click on the 'Strat Section' heading option located at the top of the Spot window. Next, switch the toggle 'On' next to 'Add a Stratigraphic Section at this Spot?' A series of fields will appear to record some general information about the section you are describing at this particular Station Site/ 'Spot'.



**Section Name**  
Name of your section at this Station Site.

**Lithology Labels/ Patterns**  
Toggle on/off, depending on preference

**Section Type**  
Select section type from drop menu; select 'outcrop' for a subaerial section

**Basin and Age**  
List the basin associated with the deposits at your section and the age

**Project Description**  
Give short description of your project

**Scale of Interest**  
Select from list of the type of subaerial station site

**Column Profile**  
Select from list of section profile options

**Column Y-Axis Units**  
Select units used for section from drop menu

**Location/ Locality**  
Describe location of stratigraphic section

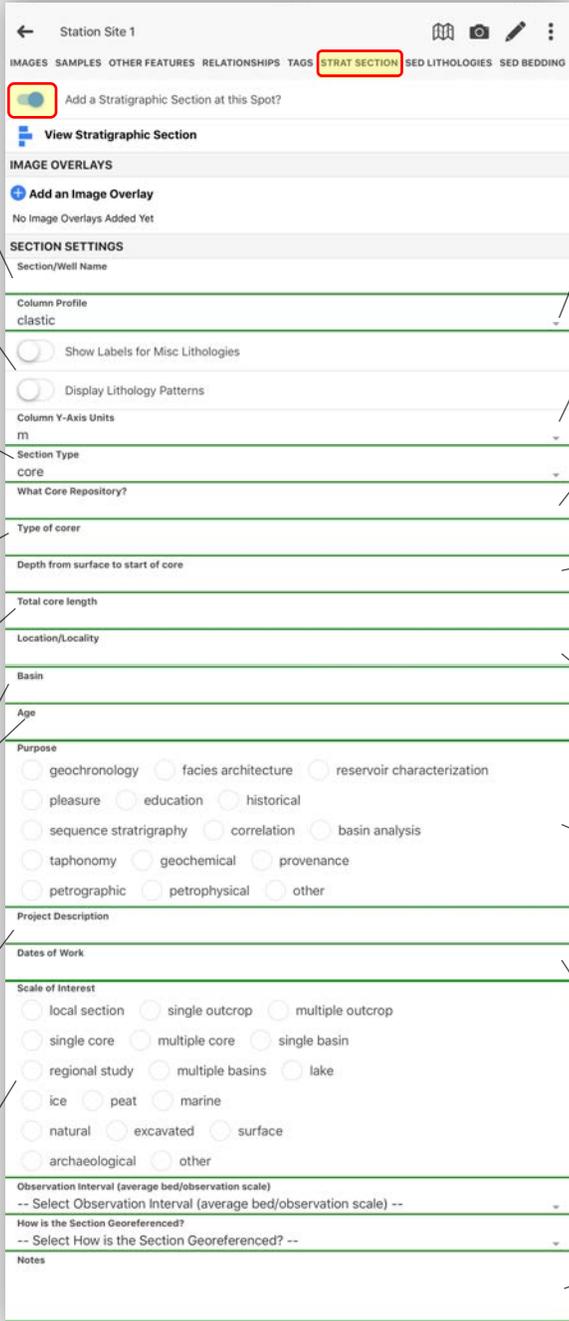
**Purpose**  
Choose from options for purpose of recording data at this section, or select other and describe in the next field

**Dates of Work**  
List the dates you work at this section

**Notes**  
Record any further initial remarks and observations

## Setting Up a Core Station Section

After creating a Station Site instructed on Page 7, click on the 'Strat Section' heading option located at the top of the Spot window. Next, switch the toggle 'On' next to 'Add a Stratigraphic Section at this Spot?' A series of fields will appear to record some general information about the section you are describing at this particular Station Site/ 'Spot'. TIP: record as much information as possible or deemed necessary.



**Section Name**  
Name of your section at this Station Site.

**Lithology Labels/ Patterns**  
Toggle on/off, depending on preference

**Section Type**  
Select section type from drop menu; select 'core' for a core section

**Type of Corer**  
Describe type of corer/ instrumentation used

**Total Core Length**  
Record composite length of core including all sections/ drives

**Basin and Age**  
List the basin associated with the deposits at your section and the age

**Project Description**  
Record short description of your project

**Scale of Interest**  
Select from list of the type of subaerial station site

**Column Profile**  
Select from list of section profile options

**Column Y-Axis Units**  
Select units used for section from drop menu

**What Core Repository**  
Describe where samples are stored/ archived

**Depth From Surface**  
Enter the depth between the reference surface (lake/ glacier surface) and where the core material begins

**Location/ Locality**  
Describe location of stratigraphic section

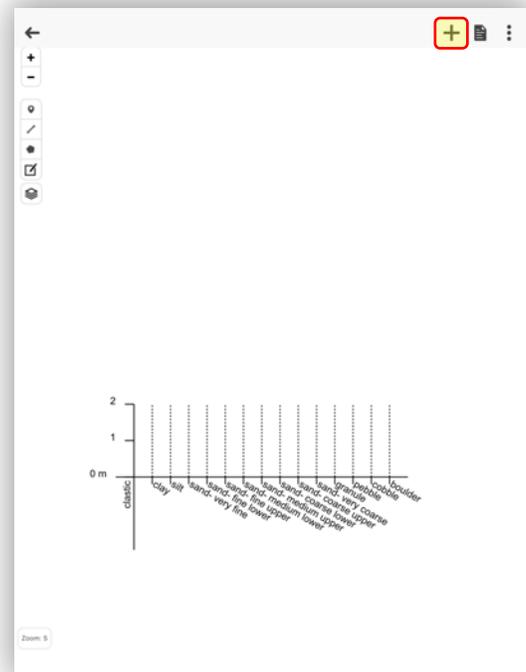
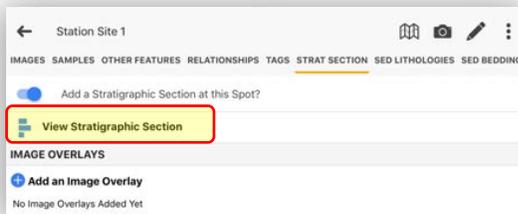
**Purpose**  
Choose from options for purpose of recording data at this section, or select other and describe

**Dates of Work**  
List the dates you work at this section

**Notes**  
Record any further initial remarks and observations

## Accessing Your Section and Adding Strat Intervals

After setting up your station section and recording general information for your section (refer to page 10 and 11), you are ready to record data and observations through your section. First, click on 'View Stratigraphic Section'. This will bring you to a new interface that will allow you to start measuring your section, recording data, collecting samples, etc. 'Add an Image Overlay' is a feature that allows you to take a photo of your section to use as an overlay for your section. This may be useful if collecting samples at specific locations throughout your section so you can add a 'Spot' to the exact location on the outcrop you sampled from. After you are at the screen with a section, click the '+' sign located at the top right corner to add a stratigraphic interval.



**Interval Name/  
Thickness/ Units**  
Enter a name your your strat level, thickness of deposit, and measured units

**Select Primary Lithology**  
Select 'volcaniclastic' for Tephra-related deposits and collections

Save Add Strat Interval X

Insert After: -- Top --

Copy Interval Data: -- None --

Interval Name  
Name autogenerated if left blank

Interval Thickness

Thickness Units  
m

Type of Interval  
bed

LITHOLOGY 1

Primary Lithology  
-- Select Primary Lithology --

THIS FIELD IS REQUIRED

Lithification  
-- Select Lithification --

Fresh Color

Weathered Color

Relative Resistance (Weathering Profile)  
-- Select Relative Resistance (Weathering Profile) --

Notes

+ Add More Detail

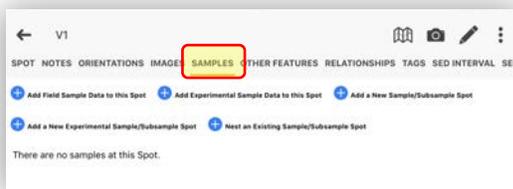
**Add More Detail**  
Click here after recording data in the above fields to add more data on this particular interval (see Page 13).

## RECORDING FIELD SAMPLES IN STRAT INTERVALS

There are two methods to collecting a sample and pinning and saving it to a specific stratigraphic interval or location in a created stratigraphic section in StraboSpot. These two methods are described below.

### General Sample from a Stratigraphic Interval

This method allows you to collect samples throughout an entire stratigraphic interval. Any samples saved in this method will be corresponded with a specific stratigraphic interval in your section. Click on the name of the stratigraphic interval you are collecting a sample from to navigate to the 'Samples' tab. Click on 'Add a Field Sample' and navigate through the following fields to record information on your collected sample (refer to Page 21 for further field details).



Save
Add A Field Sample
✕

Label \*  
If a label is not specified a default label will be given.

Sample Specific ID/Name

Main Sampling Purpose  
-- Select Main Sampling Purpose --

Deposit Thickness

Sample Description

Material Type  
tephra

Sample Type 1

debris flow     tephra fall

pyroclastic flow     pyroclastic surge

lava     gas

intrusion     regolith

diamict     other

Sample Type 2

bulk     juvenile

matrix     pumice

scoria     lithic

block or bomb     channel

other

Density

Color

Lithology

Sample Unit

Inplaceness of Sample  
-- Select Inplaceness of Sample --

Oriented Sample  
-- Select Oriented Sample --

Sample Size

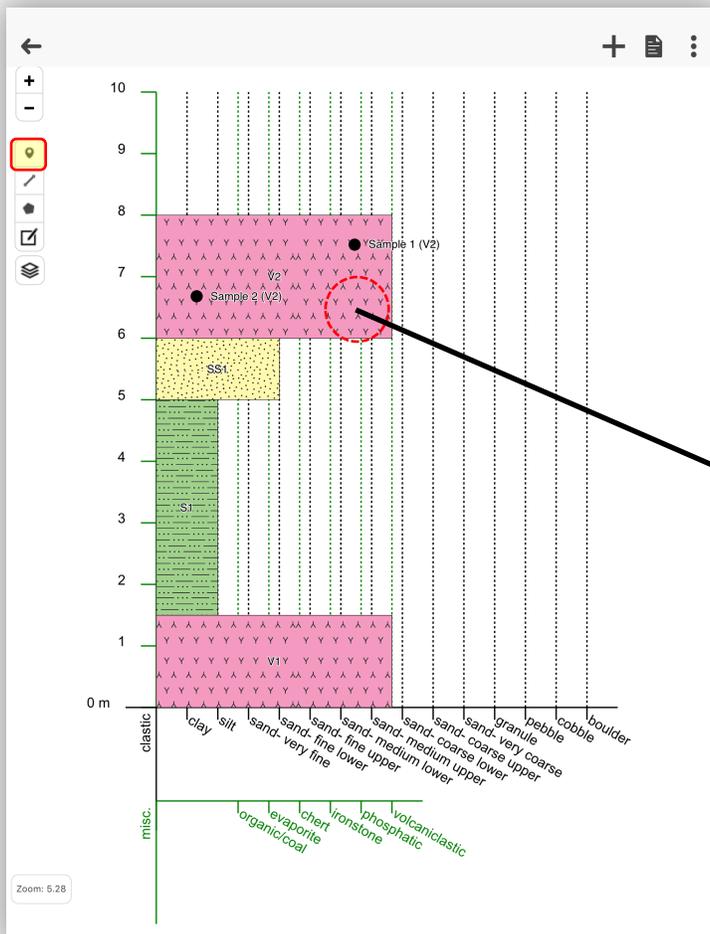
Degree of Weathering  
-- Select Degree of Weathering --

Sample Notes



## Sample from a Specific Location ('Spot') within a Section

Similar to how you add a 'Spot' or 'Station Site' to a map, you can add a Spot to your stratigraphic section to record the locations of samples collected. From the Strat Section interface, click on the 'Point' tool  located on the left side of the screen. Next click on the location on your stratigraphic section that you are sampling from. This will create a 'Spot' where you can add, name, and record sample information under the 'Samples' tab.



15871187294366

SPOT NOTES ORIENTATIONS IMAGES **SAMPLES** OTHER FEATURES RELATIONSHIPS TAGS SED LITHOLOGIES

Spot Name  
Name this Spot

**GEOGRAPHY**

Set Real-World Coordinates to My Location

Geometry  
Point

**STRAT SECTION COORDINATES**

X Pixels	Y Pixels
65.684057	131.821108

**REAL-WORLD COORDINATES**

Latitude	Longitude
38.967854	-95.248975

GPS Accuracy (m)

Accuracy level of the latitude and longitude coordinates in meters.

Altitude (m)

260.79

Radius of Spot (m)

**ROCK UNIT**

**NOTES**

Notes about this Spot

**OTHER**

ID  
15871187294366

Date  
Apr 16, 2020

## Recording Data and Information for Section Field Samples

After getting to the 'Add a Field Sample' window (discussed on Pages 19 and 21), you will be given a list of fields to record information on your collected sample. The following describes each field.

**Label and Sample Specific ID/ Name**  
Record a label for your sample as well as the specific ID or name associated with your collected sample

**Sample Description**  
Short description of sample and why sampled (not analysis type)

**What is sampled?**  
Select from Sample Type 1 and 2 from list of what is being sampled

**Color**  
Describe color of collected sample; include whether fresh/ weather and wet/ dry

**Sample Notes**  
Add any additional notes and descriptions of sample collected. This may include an explanation of how your sample was named/ labeled, description of your sampling container, number of samples taken, etc.

Save
Add A Field Sample
✕

**Label** ⓘ  
If a label is not specified a default label will be given.

Sample Specific ID/Name

Main Sampling Purpose  
-- Select Main Sampling Purpose --

Deposit Thickness

Sample Description

Material Type  
tephra

Sample Type 1

debris flow     tephra fall

pyroclastic flow     pyroclastic surge

lava     gas

intrusion     regolith

diamict     other

Sample Type 2

bulk     juvenile

matrix     pumice

scoria     lithic

block or bomb     channel

other

Density

Color

Lithology

Sample Unit

Inplaceness of Sample  
-- Select Inplaceness of Sample --

Oriented Sample  
-- Select Oriented Sample --

Sample Size

Degree of Weathering  
-- Select Degree of Weathering --

Sample Notes

**Main Sampling Purpose**  
Select from drop menu the main sampling purpose

**Deposit Thickness**  
Numerical thickness of deposit being sampled from and units

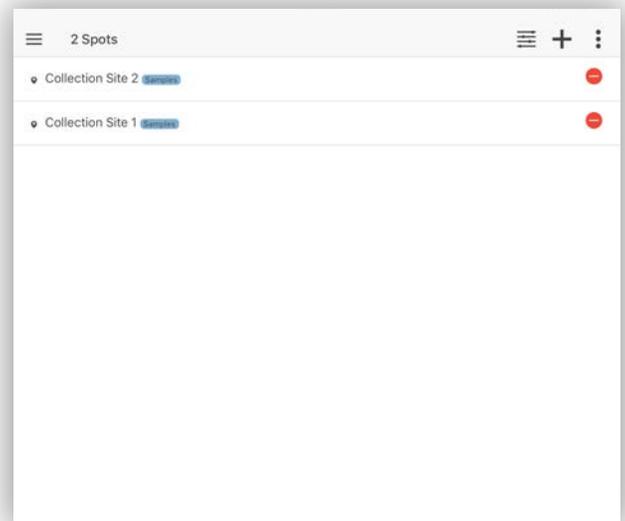
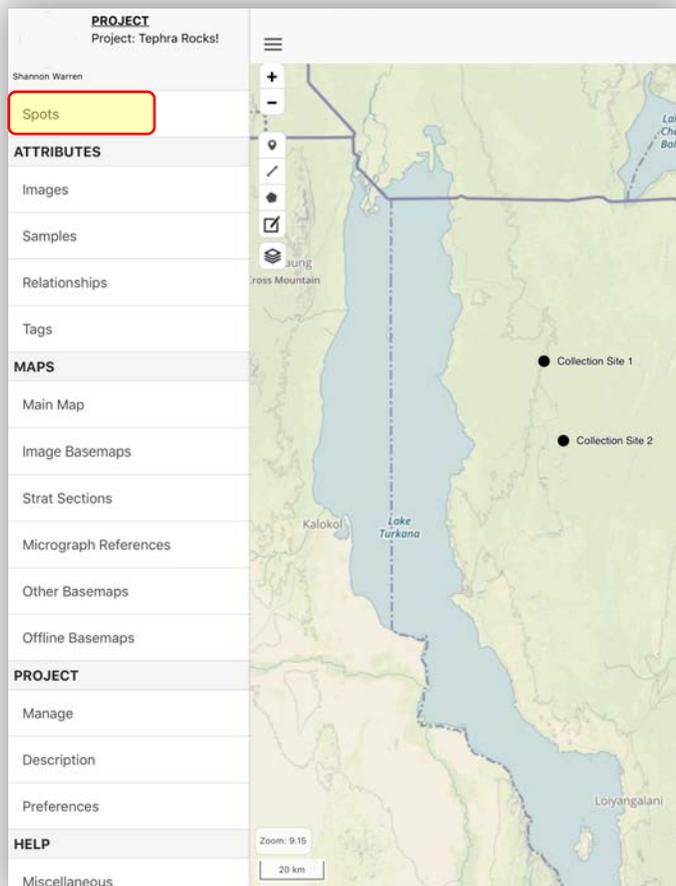
**Material Type**  
Select from options; for tephra sample, select 'tephra'

**Density**  
Record the in-situ deposit density (kg/m<sup>3</sup>) and describe method used to determine this value

**Sample Size**  
Qualitative or quantitative description of size of sample(s) collected

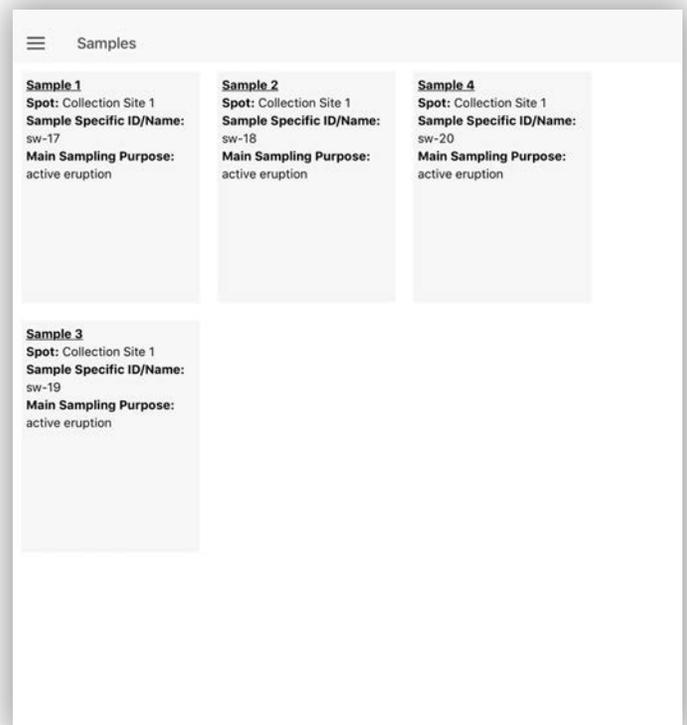
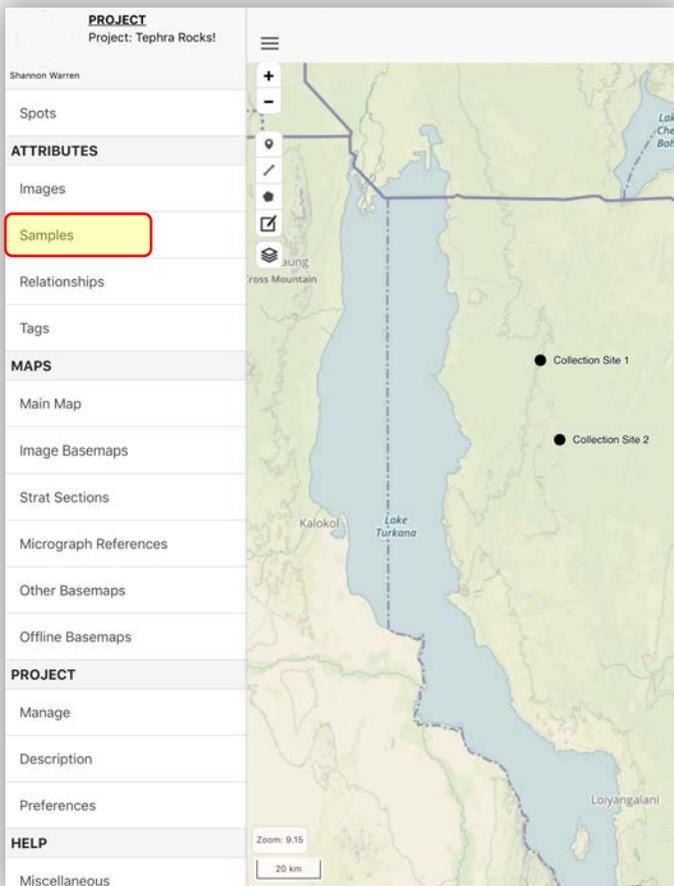
## QUICK ACCESS TO SPOTS

From the 3-line menu ≡ button, click on 'Spots'. Here, you will find a list of your recorded Spots. Clicking on a Spot will bring you back to the data recorded and saved under that Spot name and location; here, you can edit or add information and data for any Spot.



## QUICK ACCESS TO SAMPLE DATA

From the 3-line menu ≡ button under the **ATTRIBUTES** heading, click on 'Samples'. Here, you will find a list of all recorded Samples in your project. You can look at your recorded data by clicking on any sample, as well as add, edit, or delete any necessary information.



## SAVING AND UPLOADING YOUR PROJECT

To save, upload, switch, or create a new project, click on the 3-line menu  $\equiv$  button. Under the **PROJECT** header, click on 'Manage', where a window of your current project details appears. Click on the 3-dot menu  $\vdots$  button located in the top right corner. Here, you can choose to create a New Project, Switch Projects, Upload Project, Download Project, Export Project to Device, Import Project from Device, or Export Sample CSV.

