



April 13, 2016

**Web:** <http://gps.alaska.edu/JKASP/>

**E-mail:** [uaf-jkasp@alaska.edu](mailto:uaf-jkasp@alaska.edu)

### JKASP 2016

#### 9<sup>th</sup> Biennial Workshop on Japan-Kamchatka-Alaska Subduction Processes

*Understanding active subduction processes in North Pacific arcs*

Geophysical Institute, University of Alaska, Fairbanks, Alaska

**MAY 31 – JUNE 3, 2016**

#### **SECOND CIRCULAR AND CALL FOR ABSTRACTS**

##### **Important Deadlines:**

- March 30: Request for Invitation letter in support of the US visa application
- April 15: Sign up for field trips
- April 29: Abstract submission
- May 10: Early registration (discounted)

The Japan-Kamchatka-Alaska portion of the Pacific Rim of Fire is amongst the most geologically active regions on Earth. This region is home to the largest earthquakes, tsunamis, and volcanic eruptions in recorded history. Yet, this is a place where human communities have lived for thousands of years, demonstrating a remarkable resilience to geohazards and adverse climate conditions. This continuing series of meetings seeks to build upon and continue a vital international geoscience community in the North Pacific to understand nature of the subduction processes and to better mitigate the associated hazards posed to our society. The intent of the meeting is to nurture productive international collaboration in research and monitoring. We welcome scholars from all countries to come and present results of recent and ongoing research projects and hazard monitoring efforts.

##### **Local organizing committee:**

Jeff Freymueller, John Eichelberger, and Pavel Izbekov (co-chairs)

Cheryl Cameron, Michelle Coombs, David Fee, Taryn Lopez, Jessica Larsen, Dmitry Nicolovsky, John Power, Natalia Ruppert, Janet Schaefer, Elena Suleimani, Kristi Wallace, Peter Webley, and Michael West

**Steering committee:**

John Eichelberger, Pavel Izbekov, Fairbanks, Alaska, United States  
Mitsuhiro Nakagawa, Hiroaki Takahashi, Sapporo, Japan  
Evgeny Gordeev, Petropavlovsk-Kamchatsky, Russia

**Meeting Venue:**

University of Alaska Fairbanks

**Themes of scientific sessions:**

- Structure and History of North Pacific Subduction Zones
- Volcanism and Volcanic Processes
- Earthquakes
- Tsunamis
- Recent Advances in Monitoring of Volcanic and Seismic Activity
- Human Aspects of Geohazards: Resilience and Resources

Optional field excursions to Katmai National Park, Cook Inlet Volcanoes, Augustine Volcano, and the Chena Hot Springs Resort will be conducted during, and after the meeting, if there is sufficient interest.

**Scientific sessions proposed by February 29, 2016:**

Recent Advances in Observing North Pacific Subduction Zones. Great earthquakes are common at subduction zones worldwide, and even smaller subduction zone earthquakes can pose significant hazards. Large earthquakes also cause significant long-lasting effects, such as aftershock sequences and postseismic deformation. This session will feature studies of earthquakes of all types within the Japan – Kamchatka/Kuril – Alaska region around the North Pacific., from all disciplines.

Structure, History and Dynamics of North Pacific Subduction Zones. The structure, history and dynamics of subduction zones can be probed by many disciplines, including seismology, geodesy, geology, and numerical modeling. New data and new studies in recent years have greatly expanded our knowledge about several North Pacific subduction zones, and the EarthScope program in Alaska is supporting a further explosion of data. This session is appropriate for observational and/or modeling studies of the structure, geological history, tectonics and dynamics of subduction zones.

This list will be updated.

**Tentative schedule**

May 22-29: Field trip to Augustine Volcano  
May 30: Evening registration and ice breaker  
May 31: Technical sessions  
June 1: Technical sessions  
June 2: Excursion to Chena Hot Springs  
June 3: Technical session and farewell dinner  
June 4: Overflight of Cook Inlet volcanoes  
June 4-7: Field trip to Katmai, light version  
June 4-17: Field trip to Katmai, heavy version

**Abstract submission guidelines:**

We invite you to submit your abstract **by April 29** by e-mail. Each participant may submit up to 2 first-author abstracts in addition to any invited contributions. Please use US Letter page size with 1 inch (2.5 cm) margins from all sides, 12 point Times New Roman for all fonts, and single line spacing for paragraphs. Please limit the size of each abstract to 2 pages with figures and references. Abstracts should be sent electronically to the local organizing committee ([uaf-jkasp@alaska.edu](mailto:uaf-jkasp@alaska.edu)) in MS Word format (.doc or .docx are both acceptable) **by April 29**. The MS Word template for abstract formatting can be found at <http://gps.alaska.edu/JKASP/>. Please refer to the abstract formatting example at the end of this circular.

**Registration:**

Participants can register for the meeting *on-line* at <http://gps.alaska.edu/JKASP/> or *in person*, during the meeting. Registration fees are \$400 for senior participants and \$250 for students. Participants registered on-line **by May 10** will be charged reduced rates of \$350 and \$200 for senior participants and students, correspondingly. To take an advantage of the reduced registration fees please complete your registration by May 10 and finalize your payment at the on-line payment site [https://epay.alaska.edu/C21563\\_ustores/web/product\\_detail.jsp?PRODUCTID=1435](https://epay.alaska.edu/C21563_ustores/web/product_detail.jsp?PRODUCTID=1435)

**Field trip sign up:**

Please consider joining us for optional field trips to Katmai, Augustine, an overflight of Cook Inlet Volcanoes, and the excursion to Chena Hot Springs. These trips will be offered based on the demand. If you are interested in field trips and/or excursion, please register for the conference and sign up for the trip(s) at <http://gps.alaska.edu/JKASP/> **by April 15**. To sign up for the field trip you would need to complete your registration and then pay a field trip deposit at [https://epay.alaska.edu/C21563\\_ustores/web/product\\_detail.jsp?PRODUCTID=1435](https://epay.alaska.edu/C21563_ustores/web/product_detail.jsp?PRODUCTID=1435).

**Requesting invitation letter in support of the US visa application:**

Russian participants will need a valid US visa to participate in the 2016 JKASP meeting. The local organizing committee will issue letters of invitation, which can be used for obtaining US visas. To request a letter of invitation, please complete the registration form at <http://gps.alaska.edu/JKASP/> and send a copy of your passport in JPEG format by e-mail to [uaf-jkasp@alaska.edu](mailto:uaf-jkasp@alaska.edu) **by March 30**. We encourage you to start the visa application process as soon as possible allowing at least 30-45 days for the entire process.

**Accommodation:**

In addition to the conventional hotel accommodation we are making arrangements for a low-cost dormitory housing at UAF campus. Here is a list of accommodation options.

UAF campus dormitories

There is a variety of accommodation options available on UAF campus. Please refer to <https://uaf.irisregistration.com/Home/Site?code=ACA2016> for basic information on room types. The daily rates vary from \$24 to \$56 plus taxes per person. This is the most convenient housing option in terms of transportation. Please note that smoking is prohibited across the entire UAF campus. There are limited dining options on campus. If interested, please make your reservation at <https://uaf.irisregistration.com/Home/Site?code=ACA2016> as an *Academic Guest*. UAF Conference Services open dormitories starting from May 29 for JKASP participants. Please let us know if you need any assistance in making your reservations.

### Off-campus hotels

Here is the list of conventional hotels with approximate room rates for May 29 – June 4, 2016. Please note that room rates vary significantly. You may find better rates for the same hotels at priceline.com, hotel.com or other booking sites.

<b>Hotel Name</b>	<b>Address</b>	<b>Approx. cost per night, USD</b>
<a href="#">Super 8</a>	1909 Airport Way, Fairbanks Alaska	\$140
<a href="#">Best Western Plus Pioneer Park Inn</a>	1908 Chena Landing Loop, Fairbanks Alaska	\$160
<a href="#">Extended Stay America - Fairbanks - Old Airport Way</a>	4580 Old Airport Way, Fairbanks Alaska	\$160
<a href="#">LaQuinta Inn &amp; Suites Fairbanks</a>	4920 Dale Rd, Fairbanks Alaska	\$180
<a href="#">Best Western Plus Chena River Lodge</a>	1255 Tvsa Way, Fairbanks Alaska	\$205
<a href="#">Rivers Edge Resort</a>	4200 Boat St, Fairbanks Alaska	\$230
<a href="#">Hampton Inn &amp; Suites Fairbanks</a>	433 Harold Bentley Ave, Fairbanks Alaska	\$230
<a href="#">Holiday Inn Express &amp; Suites Fairbanks</a>	400 Merhar Ave, Fairbanks Alaska	\$240
<a href="#">Springhill Suites</a>	575 1st Ave, Fairbanks Alaska	\$265

### **Financial support:**

The organizers expect to be able to provide a limited amount of financial assistance to students and young scientists.

## FIELD TRIPS AND EXCURSIONS

Participants should arrange for their travel to and from the workshop, including stops for the excursions as needed. Normally a stopover in Anchorage should not increase the total cost of the ticket. For questions and help arranging travel, please contact the local organizing committee, and visit the meeting website at <http://www.gps.alaska.edu/JKASP/>. *Please note that some field trips are subject to cancellation if there are not enough participants, or the cost per participant may increase if fewer than expected sign up. We will notify registrants promptly of any changes.*

### AUGUSTINE

Date:	May 22-29, 2016	Trip Leader: TBA
Participants:	7	
Cost:	\$2300*	

\* *The trip cost includes lodging in Anchorage for two nights (May 22 and May 27), transportation to the field, and all lodging and food expenses during the trip.*

Augustine Volcano is an andesite and dacite dome complex built on Jurassic sedimentary rocks of the Naknek Formation that forms Augustine Island, a small (~100 km<sup>2</sup>) unpopulated island located within Kamishak Bay on the west side of Lower Cook Inlet, 290 km southwest of Anchorage, Alaska and 120 km southwest of Homer, Alaska. It lies along an active segment of the Aleutian arc. In historical time, it has produced more eruptions than any other volcano in the Cook Inlet region, with 6 major eruptions in the past ~125 years (1883, 1935, 1963–64, 1976, 1986, and 2006). Augustine is the most intensively monitored (seismic and real-time geodetic) volcano in Alaska. Recent eruptions have begun with explosive generation of tephra and pyroclastic-flow deposits followed by prolonged periods of dome growth and lava-flow extrusion. The 1883 and several prehistoric eruptions additionally produced catastrophic volcanic landslides that entered the sea and generated tsunamis. Topics to be discussed include Pyroclastic deposits of the 2006 eruption; Volcanic landslides and tsunami generation; Prehistoric (pre-1883) versus historical magma petrogenesis; Eruption triggering and magma mixing.

### Tentative Schedule:

- May 22: Participants arrive to Anchorage, stay overnight in UAA dormitory
- May 23: Acquire food, visit AVO, drive to Homer, Alaska, and take a chartered floatplane flight to the west side of Augustine Island.
- May 24-27: Examine pyroclastic-flow deposits, landslide deposits, tephra fall deposits, lava flows, and domes while hiking up to 25 km a day over uneven and steep terrain in highly variable and unpredictable weather conditions carrying 10–15 kg backpacks.
- May 28: Take chartered floatplane flight from Augustine to Homer, then drive to Anchorage, arriving in late afternoon, stay overnight in UAA dormitory.
- May 29: Participants fly to Fairbanks.

### Special Considerations:

This field trip will require tent camping on a remote volcanic island and strenuous hiking of distances as far as 25 km across uneven and steep terrain in unpredictable and potentially dangerous weather. Wind speeds as great as 60 mph and freezing rain are not uncommon at Augustine in the summer, and participants are reminded that they must provide their own gear (sturdy tent, sleeping bag, sleeping pad, boots, backpack, water bottles) to meet the challenges of the weather.

### CHENA HOT SPRINGS

Date: June 2, 2016\* Trip Leader: TBA  
Participants: 45  
Cost: \$100\*\*

\* The date of the trip is tentative.

\*\* The price includes transportation, pass to the hot springs, bag lunch, and dinner at the Chena Hot Springs Restaurant

The day trip to Chena Hot Springs will provide an opportunity to extend our scientific discussions to a less formal environment. In addition to swimming in the hot springs, the participants will be able to take a tour to the geothermal power plant and discuss the utilization of renewable energy.

### OVERFLIGHT OF COOK INLET VOLCANOES

Date: June 4, 2016 Trip Leader: Janet Schaefer, State of Alaska  
Participants: 6 Division of Geological & Geophysical Surveys,  
Cost: \$600 per person\* janet.schaefer@alaska.gov

\* This cost includes charter overflight only.

This overflight provides views of four active stratovolcanoes on the west side of Cook Inlet: Spurr, Redoubt, Iliamna, and Augustine volcanoes. Redoubt's eruption in 2009 consisted of 19 explosive event sending ash to as high as 19 kilometers (62,000 feet), culminating with the extrusion of a 72 million cubic meter lava dome in the summit crater. Lahars, with depths of up to 10 meters, flooded the Drift River Valley and inundated the Drift River Oil Terminal. Weather permitting, this flight-seeing tour will provide participants with views of Redoubt's steaming lava dome, summit crater, glaciers, the Drift River, and the Alaska Volcano Observatory's monitoring stations. For photographs and a detailed description of the 2009 eruption, please download "The 2009 eruption of Redoubt Volcano, Alaska" here: <http://dggs.alaska.gov/pubs/id/23123>.

#### Schedule:

This is a one-day trip that begins and ends in Anchorage. Participants will need to provide their own flight arrangements from Fairbanks to Anchorage (see flight suggestions below), and book their own lodging at the Lakefront Anchorage Hotel, <http://www.millenniumhotels.com/usa/millenniumanchorage/>.

June 4: Participants arrive in Anchorage. Flight suggestions from Fairbanks to Anchorage:  
Alaska Air Flight 2828 Departs Fairbanks at 7:40am, Arrives Anchorage at 8:46am  
Alaska Air Flight 2802 Departs Fairbanks at 8:45am, Arrives Anchorage at 9:51am  
Alaska Air Flight 2826 Departs Fairbanks at 9:45am, Arrives Anchorage at 10:55am

June 4, 1PM: Meet at the Lakefront Anchorage Hotel for a van shuttle to a charter flight hangar  
June 4, 2PM-5PM: Overflight of Cook Inlet Volcanoes

June 4, 6PM: Shuttle provided back to the hotel then optional evening dinner together at The Lakefront Anchorage Hotel Restaurant and Bar.

### **KATMAI I (LIGHT)**

Date: June 4-7, 2016 Trip Leader: TBA  
Participants: 6-8  
Cost: \$1800\*

*\* This cost includes lodging in Anchorage on June 4, transportation from Anchorage to Katmai, and all lodging & food expenses during the field trip (June 5-6). Participation in the optional overflight is \$175 extra.*

This trip offers a unique opportunity to visit the Valley of Ten Thousands Smokes, the site of the largest eruption in 20<sup>th</sup> century. Based at the Brooks Lodge, the participants will conduct a day trip to the Valley. In addition to the spectacular overview of the Valley, there will be an opportunity to hike to the outcrop of the 1912 pyroclastic flow deposits. Optional overflight of the Valley and adjacent volcanoes can be arranged if weather permits. Please note that the excursion will start and end in Anchorage.

#### **Schedule**

Please note that the excursion will start and end in Anchorage. We suggest that flight arrangements for JKASP participants include a *stopover* in Anchorage with an arrival to Anchorage no later than the evening of June 4. After the excursion, all participants will be able to catch a flight departing Anchorage on June 6 in late afternoon.

June 4: Participants arrive in Anchorage.

June 5: Fly to Katmai National Park. Optional overflights of the Valley if weather and time permit. Spend night in cabins at Brooks Lodge.

June 6: Bus to the Valley of Ten Thousand Smokes, short hike (less than 3 miles) to the pyroclastic flow deposits of the 1912 Katmai eruption. Take optional overflights of the Valley if weather and time permit. Spend second night in cabins at lodge.

June 7: Another chance for an overflight in the morning. Fly to Anchorage in time for evening departures.

### **KATMAI II (HEAVY)**

Date: June 4-17, 2016 Trip Leader: Pavel Izbekov and Taryn Lopez  
Participants: 5-6  
Cost: \$2600\*

*\* The trip cost includes lodging in Anchorage for two nights (June 4-6), transportation to the field, and all lodging and food expenses during the trip.*

This rigorous hiking trip offers a unique opportunity to explore the Valley of Ten Thousands Smokes, the site of the largest eruption in 20<sup>th</sup> century. Participants will examine products of the 1912 Katmai eruption, i.e. pyroclastic flow deposits, extrusive dome Novarupta, and Katmai Caldera. We will expand the range of observed volcanic features and phenomena through visiting the Southwest Trident volcano with lava flows and the cone formed during the 1950s and 60s. The trip will provide the most scenic setting to discuss relationships between spatially associated but chemically distinct magmas, origin of high-silica rhyolite, magma storage (seismic and petrologic constraints), caldera formation, pyroclastic flows, Plinian eruptions, effusive eruptions, and magma mixing

#### **Schedule**

The excursion will start and end in Anchorage. Therefore, we suggest that flight arrangements for JKASP participants include a *stopover* in Anchorage with arrival to Anchorage no later than the evening of June

4. After the excursion, all participants will be able to catch a flight departing Anchorage on June 17, in late afternoon.

June 4: Participants arrive in Anchorage.

June 5: The morning is spent acquiring food supplies. In the afternoon we will be briefed on the current state of volcanic activity at Katmai and weather forecast. We will provide safety orientation. We will pack our field gear and acquired food supplies.

June 6: Fly to Katmai National Park. Spend night in cabins at lodge.

June 7: Bus to Valley of Ten Thousand Smokes, hike to Baked Mountain Huts, stay at huts and tents.

June 8-15: Day hikes as weather permits; scientific discussions on other days:

- Novarupta Dome (effusive vs explosive volcanism; eruption history)
- Katmai Caldera (caldera formation; magma chamber; internal structure of arc volcanoes)
- Trident Volcano lava flows and vent (cone building; normal arc volcanism; magma mixing)
- Upper Lethe Valley (ignimbrite emplacement; welding; glacier/tephra interaction; glacier/lava interaction; glacial retreat; magma intrusion)
- Upper Knife Creek Valley (more ignimbrite features; phreatic deposits; fumarolic systems)
- Griggs Volcano (cone growth and sector collapse; fumaroles)
- Baked Mountain (pyroclastic surges; sedimentary basement; valley overview).

June 16: Hike from huts to trailhead; bus to the lodge; spend night at the lodge.

June 17: Fly to Anchorage in time for evening departures to Fairbanks, and then proceed to Fairbanks.

### **Special considerations**

The trip is strenuous and therefore suitable only for people in excellent physical shape, who have a profound fieldwork experience. Participants are responsible for their own field gear. Registered participants will receive a list of recommended equipment as well as a field guide. The excursion will be shared with the annual International Volcanological School offered as a for-credit class at UAF (<http://www.uaf.edu/geology/academics/international-volcanology/>). The class is attended by graduate and undergraduate students from US and foreign Universities, who are selected on a competitive basis.

## **SUBDUCTION-ZONE BEHAVIOR BACKED OUT OF TSUNAMI DEPOSITS, KAMCHATKA, FAR EASTERN RUSSIA**

**Joanne Bourgeois<sup>1</sup>, Vasily Titov<sup>2</sup>, Tanya Pinegina<sup>3</sup>**

<sup>1</sup>*Earth & Space Sciences, Univ. of Washington. Seattle, WA, USA.*

<sup>2</sup>*JISAO (UW)-PMEL (NOAA), Seattle, Washington. USA.*

<sup>3</sup>*Institute of Volcanology & Seismology, Petropavlovsk-Kamchatsky, Russia.*

For nearly ten years on Kamchatka, our team of geoscientists has been collecting data on tsunami deposits, both historical and pre-historical. Abundant Holocene tephra on Kamchatka permit constraints on the timing of both historical and prehistoric tsunamis, which we take as proxies for subduction-zone earthquakes. Millennial-scale histories are one goal of these studies (e.g., Pinegina and Bourgeois, 2003; Pinegina et al., 2003a&b). Another goal is enhanced investigation of historical tsunamis (as catalogued by Zayakin and Luchinina, 1987; plus 1997 Krontoskoye), both to generate benchmarks for older tsunami deposits, and also, as shown below, to elucidate earthquake-tsunami linkages during these remote, recent events.

### *1969 Ozernoi earthquake and tsunami*

On 22 November 1969, 23:09:35 GMT (locally midday, 23 November), an earthquake jolted the Ozernoi Peninsula, with local shaking of 7-8 MM (Fedotov and Gusev, 1973). The epicenter was located at 57.8°N, 163.6°E, just off the Ozernoi Peninsula. Fedotov and Gusev (1973) interpreted this earthquake as an oblique slip event with a significant component of left strike slip, but as early as 1975, it had been reinterpreted as a thrust fault (Cormier, 1975), based on data from global and Canadian seismograph networks. Using body waveform analysis, Daughton (1990) also found a thrust fault-plane solution, striking N50°-80°E and dipping 5°-10°NW, and assigned a moment magnitude of 7.8. Various magnitude for this earthquake have been published (7.3-7.8); a tsunami magnitude  $M_t=7.7$  based on the tsunami height at Hawaii is consistent with a moment magnitude of 7.7-7.8.

The 1969 Ozernoi earthquake was followed by a tsunami with local runup reported to be 5-7 m from the village of Ivashka south around the Ozernoi Peninsula to the Ozernaya River, and a local maximum of 10-15 m south of Cape Ozernoi (Olkhovaya River) (Zayakin, 1981). Runup was 1-3 m north to Lavrova Bay and southeast to Bering Island, and the tsunami was recorded on tide gages in the town of Ust'-Kamchatsk and faintly in Petropavlovsk-Kamchatskiy. Based on the presence of tsunami deposits above the 1964 Shiveluch tephra or the 1956 Bezymianniy tephra, we have expanded the runup catalogue for this event to all our field sites in the southwest Bering Sea. Moreover, we have evidence of post-1956 subsidence at the northern and southern extremes of the Ozernoi Peninsula, which we interpret to be co-seismic with 1969 event.