Data Set Citation

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Bladon K , Cook N , Light J , and Segura C.
A catchment-scale assessment of stream temperature response to contemporary forest harvesting in the Oregon Coast Range
GuenPatty.11.4

General Information

Title:	**A catchment-scale assessment of stream temperature response to contemporary forest harvesting in the Oregon Coast Range**
Identifier:	GuenPatty.11.4
Abstract:	Historical forest harvesting practices were reviewed in the original Alsea Watershed Study where they found increased energy loading to the stream and produced higher stream temperatures. This was an important early research site that lead to the development of contemporary forest management practices to protect water quality and fish habitat in Oregon and elsewhere. Here we present an analysis of 6 years (3 years pre-harvest and 3 years post-harvest) of summer stream temperature data from a reference (Flynn Creek) and a harvested catchment (Needle Branch). The collected parameters include air temperature, the mean and max, stream temperature, mean and max, and the diel (daily) temperature fluctuations (max minus the minimum temperature).
Keywords:	○ Forest management ○ Stream-guaging stations ○ Pacific Northwest ○ Riparian areas ○ Thermal pollution ○ Water temperature

Involved Parties Data Set Creators

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Data Set Characteristics

Geographic Region:

Geographic Description:	Flynn Creek Basin, hydrologic units (HUC14): 17100205030201
Bounding Coordinates:	West: -123.891211 degrees East: -123.734109033 degrees North: 44.559185 degrees South: 44.532827 degrees

Geographic Region:

Geographic Description:	Flynn Creek USGS Stream Gage
Bounding Coordinates:	West: -123.87831 degrees East: -123.75443169 degrees North: 44.535218 degrees South: 44.535218 degrees

Geographic Region:

Geographic Description:	Flynn Creek stream temperature thermistor: FC12
Bounding Coordinates:	West: -123.85677 degrees East: -123.73291323 degrees North: 44.54672 degrees South: 44.54672 degrees

Geographic Region:

Geographic Description:	Flynn Creek stream temperature thermistor: FC6
Bounding Coordinates:	West: -123.85689 degrees East: -123.73303311000001 degrees North: 44.54271 degrees South: 44.54271 degrees

Geographic Region:

Geographic Description:	Flynn Creek stream temperature thermistor: FC2
Bounding Coordinates:	West: -123.85419 degrees East: -123.73033581 degrees North: 44.54004 degrees South: 44.54004 degrees

Geographic Region:

Geographic Description:	Needle Branch Creek Basin, HUC14: 17100205030202
Bounding Coordinates:	West: -123.863906 degrees East: -123.841675 degrees North: 44.52874 degrees South: 44.508146 degrees

Geographic

Geographic Description:	Needle Branch USGS Stream Gage
Bounding Coordinates:	West: -123.85647 degrees East: -123.73261353 degrees North: 44.509812 degrees South: 44.509812 degrees

Geographic Region:

Geographic Description:	Needle Branch stream temperature thermistor: NB7
Bounding Coordinates:	West: -123.84987 degrees East: -123.72602013 degrees North: 44.52056 degrees South: 44.52056 degrees

Geographic Region:

Geographic Description:	Needle Branch stream temperature thermistor: NB6
Bounding Coordinates:	West: -123.85175 degrees East: -123.72789825 degrees North: 44.51686 degrees South: 44.51686 degrees

Geographic Region:

Geographic Description:	Needle Branch stream temperature thermistor: NB2
Bounding Coordinates:	West: -123.85472 degrees East: -123.73086528 degrees North: 44.51795 degrees South: 44.51795 degrees

Time Period:

Begin:	2006-03-01
End:	2012-09-30

Sampling, Processing and Quality Control Methods

Step by Step Procedures

Step 1:	**Thermistor Quality Control and Assurance**
Description:	The temperature data for all sites and years was monitored for the Alsea Watershed study and Revisited Alsea Study with tidbit, thermistor dataloggers at dispersed sites and with equipment at the gaging stations. The gauge stations were doubled up in some years (after 2012) by zip-tying a tidbit to the water sampling boom. These are recorded in the file a proprietary file where the serial numbers of the dataloggers are shown in each site*year cell. In some years, there were extra tidbits which doubled-up in case the older tidbits failed. Our comparative analyses of the data showed them to be nearly identical. There are a few cases where the analyses suggested we choose one of the two for archiving and further analysis. Only sites with complete data were used for analysis in the dataset.

Instrument(s):	The status of the temperature gauges and thermistors was recorded in a proprietary, Excel file and used to select which thermistors data was to be utilized for data analysis.
Step 2:	**AlseaWatershedStudy_Temperature_2015.csv**
Description:	**Blank values are indicated by "NA"** Study: location/study identifier Date: yyyy-mm-dd; date of collection Month: numeric month of the year Day: numeric day of the month DOY: day of the year Year: collection year (2006 to 2012) Timing: “Pre-harvest” , “Harvest” , or “Post-harvest” Catchment: watershed location: “Needle_branch” or “Flynn_ck” Station: NB_6, NB_7, NB_2, FC_2, FC_6, or FC_12; paired-gauges used to acquire data SiteClass: “Treatment” or “Control” LeapYr: “TRUE” or “FALSE” Tair_Mean: air temperature mean in degrees Celsius Tair_Max: air temperature max in degrees Celsius Ts_Mean: stream temperature mean in degrees Celsius Ts_Max: stream temperature max in degrees Celsius Ts_Min: stream temperature min in degrees Celsius Ts_7dayMax: stream temperature seven day max in degrees Celsius Ts_Diel: stream temperature daily fluctuation (Ts_Max – Ts_Min)
Instrument(s):	Stream temperatures were measured with Onset TidbiT water temperature data loggers (UTBI-001, Onset Corporation, Bourne, MA; accuracy ±0.21C)
Associated Datasets:	
Description:	Souder, J. (2020). Alsea Watershed Study 1959-1972 (Version 1) [Dataset]. Oregon State University. https://doi.org/10.7267/c821gr90d Segura C , Bladon K , Hatten J , Jones J , Hale C , Ice G , and Souder J. (2020). Long-term effects of forest harvesting on summer low flow deficits in the Coast Range of Oregon (Version 1) [Data Set]. Oregon State University. https://doi.org/10.7267/c821gr99w Hatten, J., Segura, C., Bladon, K., Hale, C., Ice, G., Stednick, J. (2020) Discharge and suspended sediment a paired watershed study examining the effects of contemporary forest harvesting in the Oregon Coast Range: Alsea Watershed Study Revisited (Version 1) [Dataset]. Oregon State University. https://doi.org/10.7267/2z10wx52x
Published Article:	
Description:	Bladon, K. D., Cook, N. A., Light, J. T., & Segura, C. (2016). A catchment-scale assessment of stream temperature response to contemporary forest harvesting in the Oregon Coast Range. Forest Ecology and Management, 379, 153–164. https://doi.org/10.1016/j.foreco.2016.08.021
Sampling Area And Frequency:	The Alsea Paired Watershed Study Revisited (44.5N, 123.9W) was constructed as a paired-watershed study, with a reference catchment (Flynn Creek, 219 ha) and a nearby treatment catchment (Needle Branch, 94 ha), which was harvested in 2009 with riparian management areas according to the Oregon Forest Practices Act (OFPA). Stream temperature (Ts) thermistors in Needle Branch were located within the harvested portion (within a stream reach with riparian vegetation retained) of the upper catchment (NB7), midcatchment above the outlet of the harvested portion of the catchment (NB6), and below the harvest, within the unharvested portion of the catchment (NB2). In Flynn Creek, Ts thermistors were also located in the upper (FC12), mid (FC6), and lower (FC2) reaches of the stream. Sites were paired beginning with the uppermost thermistors (i.e., FC12 and NB7) – additional thermistor pairs across the control (Flynn Creek) and harvested (Needle Branch) catchments were selected at a thalweg distance between thermistor deployments on each stream of approximately 400–500 m (i.e., FC6 and NB6; FC2 and NB2).

Sampling Description:	Measurements were taken at 30-min intervals using Onset TidbiT water temperature data loggers (UTBI-001, Onset Corporation, Bourne, MA; accuracy ±0.21 C). Prior to deployment each season, data loggers were calibrated against each other and tested for responsiveness in a controlled environment by placing in a slurry of water and ice for 30 min at a high sampling frequency. Loggers that were nonresponsive or recorded temperatures outside of the specifications (i.e., ±0.21 C) were replaced with new loggers. Loggers were deployed from mid-June or early July to early September to measure during the warmest time of the year through both the preharvest (2006–2008) and post-harvest (2010–2012) periods. Temperature sensors were shielded from direct solar radiation by placing in rock cairns with the ends open parallel to stream flow to ensure good mixing.

Data Set Usage Rights

Access Control:

Auth System:	knb	
Order:	allowFirst	
Allow:	[read]	public