stream_temperature

Correlation between stream temperatures in Slovenian streams in which marble trout live

1. Marble trout and Western Slovenian streams Marble trout is a freshwater resident salmonid endemic in the Adriatic basin of Slovenia. Whether there are still pure marble trout populations living in the Po river system (Northern Italy) is subject of current research. Marble trout live in streams with mean summer temperature below 15°C and winter temperature ranging from 0 to 5 °C. Marble trout spawn in November-December and offspring emerge in May-June. The Marble Trout Conservation Program started in 1993 in the upper reaches of the Soca River basin and its tributaries - the Idrijca and Baca Rivers - in Western Slovenia. Eight pure marble trout populations, all isolated and separated from the downstream hybrid marble-brown trout zone by impassable waterfalls, live in headwater streams in the basins of Soca, Baca, and Idrijca Rivers: Huda [Huda], Lower Idrijca [LIdri], Upper Idrijca [UIdri], Lipovesck [Lipo], Studenc [Stu], Svenica [Sve], Zadlascica [Zadla], Trebuscica [Trebu].

2. Analyses For some of the analyses I intended to carry out (temperature-dependent survival and growth), it was necessary to have complete temperature records for all streams since the start of the sampling. Start by sourcing the file Temp.r.

```
library(knitr)
source("Temp.r")
```

The output temp.df (along with the production of a ten-panel plot with stream-specific monthly temparature boxplots) is a dataset with column Date, Temp (– mean temp –), Year, Month, Stream, Calc (Meas = temperature has been recorded). Then, I tested the correlation between stream temperatures between pair of streams (one is the target - the one with missing data – and the other is the tested) and I used the temperature data of the tested stream with highest correlation with the target stream to impute the missing data.

```
Temp.tb = Temp.corr.f(temp.all.df)
head(Temp.tb)
```