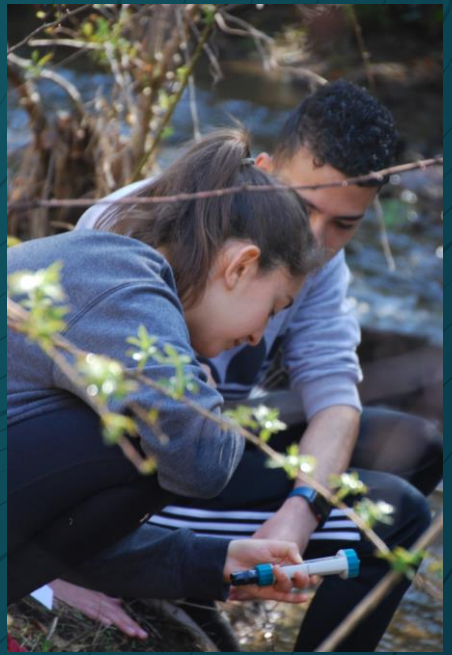
An Analysis of the Reliability and Usefulness of the BKTI Model over a 5 year period

By: Lydia Cheng

Introduction

WHO ARE WE AND WHAT DO WE DO?

- Save Our Streams Club
  - Club where high school students are lead data collections
- Collect data from various sampling sites over a 5 year period
- Analyze data by using the BKTI Model



The BKTI Model

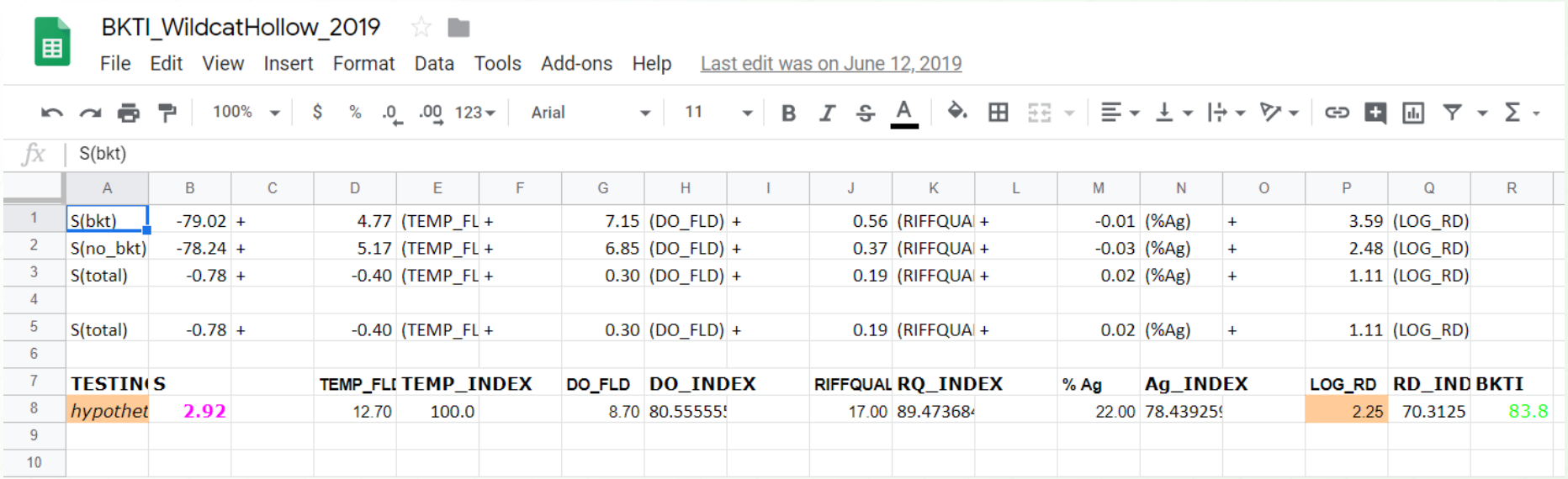
What is the BKTI Model and how is it implemented?

- A model that evaluates the quality of a subwatershed and establishes a rating for comparison of watersheds
- Quality attributes shown to be the best predictors of conditions conducive for sustainable brook trout populations.
- Students enter data into the program which calculates a BKTI value
  - High BKTI = not ideal conditions, needs improvement
  - Low BKTI = ideal conditions, no further action necessary

HIGH

LOW

BKTI Model in Action



BKTI_WildcatHollow_2019

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fx S(bkt)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	S(bkt)	-79.02	+	4.77	(TEMP_FL	+	7.15	(DO_FLD)	+	0.56	(RIFFQUA	+	-0.01	(%Ag)	+	3.59	(LOG_RD)	
2	S(no_bkt)	-78.24	+	5.17	(TEMP_FL	+	6.85	(DO_FLD)	+	0.37	(RIFFQUA	+	-0.03	(%Ag)	+	2.48	(LOG_RD)	
3	S(total)	-0.78	+	-0.40	(TEMP_FL	+	0.30	(DO_FLD)	+	0.19	(RIFFQUA	+	0.02	(%Ag)	+	1.11	(LOG_RD)	
4																		
5	S(total)	-0.78	+	-0.40	(TEMP_FL	+	0.30	(DO_FLD)	+	0.19	(RIFFQUA	+	0.02	(%Ag)	+	1.11	(LOG_RD)	
6																		
7	TESTIN(	S		TEMP_FLI	TEMP_INDEX		DO_FLD	DO_INDEX		RIFFQUAL	RQ_INDEX		% Ag	Ag_INDEX		LOG_RD	RD_IND	BKTI
8	*hypothet*	2.92		12.70	100.0		8.70	80.55555		17.00	89.47368		22.00	78.43925		2.25	70.3125	83.8
9																		
10																		

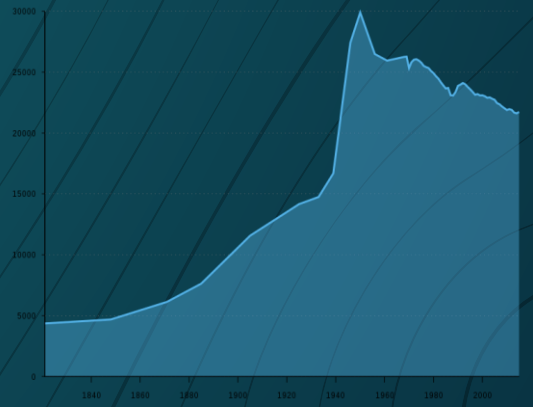
Issues with BKTI

Reliabilty

- BKTI only accounts for sampling locations during ideal conditions
  - BKTI does not account for discrepancies in sampling locations
- No margin of error for data
  - BKTI does not have leeway for human errors in the inputted data

“All models are wrong. However, some are useful.”

~ George E. P. Box



How we work around discrepancies

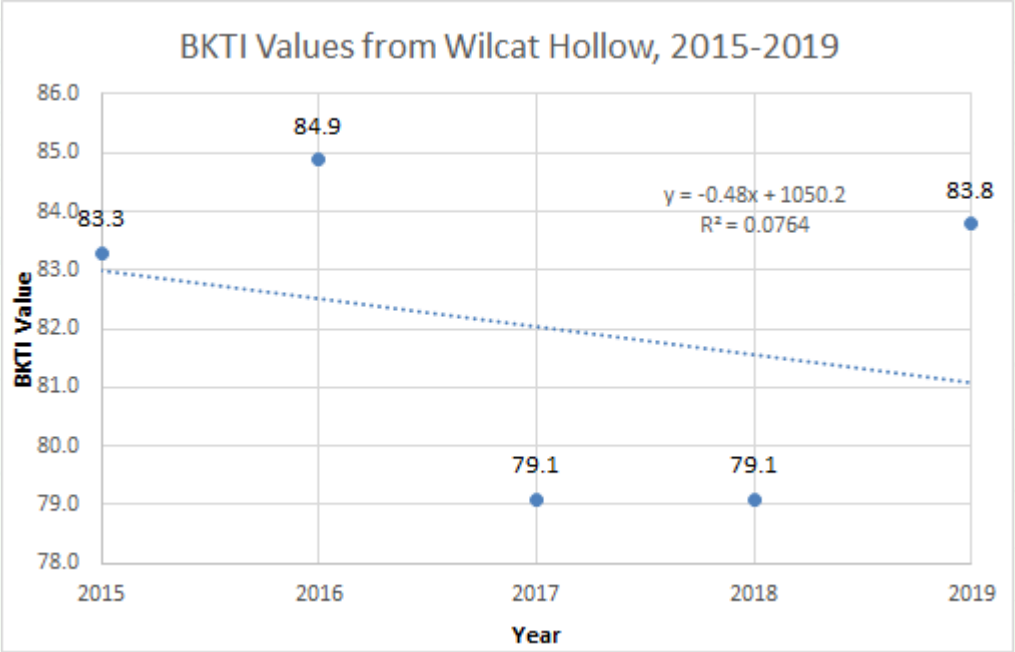
Using a baseline location

Quality Control

Collaboration

Mann-Kendall Test

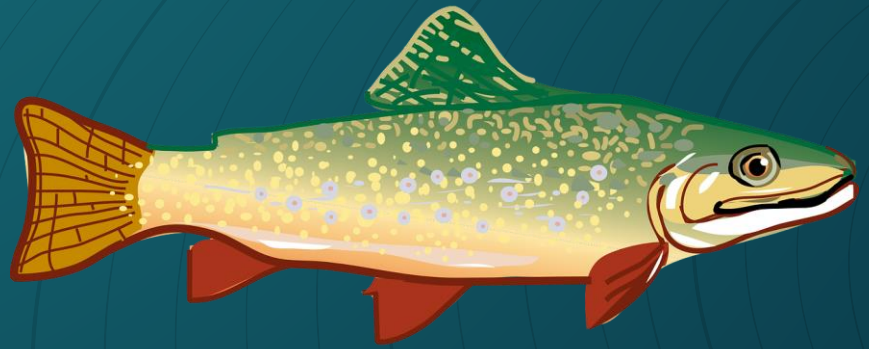
Year	BKTI Value
2015	83.3
2016	84.9
2017	79.1
2018	79.1
2019	83.8



Reference: https://www.real-statistics.com/time-series-analysis/time-series-miscellaneous/mann-kendall-test/

Conclusion

- BKTI is…
  - A model that provides some information about collected data
  - Flawed, but still useful
  - Useful as an indicator for conditions at other sites



Acknowledgements

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