

# Summary of Swimmer's Itch Data from CSA Beach 2013-2015

## INTRODUCTION:

During each of the past three summers, lifeguards at the Congregational Summer Assembly (CSA) beach have collected information on the number of swimmers and cases of swimmer's itch (SI). Data are recorded daily for: the number of swimmers, total cases of SI, time of day (morning/afternoon), prevailing wind direction, wind speed, and water temperature. Results are collected each day from the third week of June through the middle of August.

## RESULTS:

### *Overall Incidence:*

As shown in Table 1, the overall SI incidence has been approximately 4.5% (i.e. 4.5 cases for every 100 swimmers) over the past three years. Incidence rates have climbed from 2.9% in 2013 to 5.3% in 2014. The cause of this increase is unknown, however, it is consistent with anecdotal reports from local residents. It is also possible that swimmers have become more aware of the study and are, therefore, more likely to report cases of SI to the lifeguards.

**TABLE 1: OVERALL INCIDENCE BY YEAR**

YEAR	TOTAL SWIMMERS	TOTAL SI CASES	INCIDENCE RATE (% = #CASES/100 WATER USERS)
2013	3981	114	2.9%
2014	5068	244	4.8%
2015	6894	367	5.3%
TOTAL	15,943	725	4.5%

### *Associated Variables:*

Two variables, wind direction and time of day, have been consistently associated with an increased risk of SI. Table 2 presents data for wind direction. In each year, the probability of having at least one case of SI was significantly higher on days when the prevailing winds were from the northwest, north or northeast (i.e. "onshore" winds). At least one case of SI was reported for 60.0% of the days with onshore winds, versus only 13.2% of days with prevailing offshore winds. It is believed that onshore winds act to concentrate schistosome cercaria in shallow areas near the shoreline, thus increasing the probability of SI.

**TABLE 2: DAYS WITH POSITIVE SI CASES BY WIND DIRECTION**

WIND DIRECTION	PERCENT OF DAYS WITH AT LEAST ONE CASE OF SI			
	2013	2014	2015	TOTAL
ONSHORE*	68.8% (11/21)	79.2% (19/27)	54.5% (12/22)	60.0% (42/70)
OFFSHORE**	31.2% (5/27)	20.8% (5/26)	3.3% (1/30)	13.2% (11/83)
SIGNIFICANCE LEVEL	p = 0.03 Significant	p = 0.003 Significant	Not Yet Available	Not Yet Available

\* Onshore = North, Northwest or Northeast

\*\* Offshore = South, Southwest, Southeast, West, or East

Incidence rates for morning versus afternoon swimmers are presented in Table 3. Overall, the incidence rate for morning swimmers was 10.2%. This is over three times higher than the afternoon rate (3.2%). We do not know why this difference occurs, however, it has been consistent throughout the course of this study. One possible explanation is that cercarial concentrations are higher in the morning, however, there is no data to confirm this.

**TABLE 3: DAYS WITH POSITIVE SI CASES BY TIME OF DAY**

TIME OF DAY	INCIDENCE RATE OF SI (CASES/TOTAL WATER USES)			
	2013	2014	2015	TOTAL
MORNING	5.2% (51/972)	13.1% (117/890)	13.3% (161/1209)	10.7% (329/3071)
AFTERNOON	2.1% (63/3009)	3.0% (127/4178)	3.9% (220/5687)	3.2% (410/12874)
SIGNIFICANCE LEVEL	p < 0.0001 Significant	p < 0.0001 Significant	Not Yet Available	Not Yet Available

Wind speed and water temperatures were not consistently associated with higher probabilities of SI.

## **CONCLUSIONS:**

It appears that the overall incidence of SI is increasing in Crystal Lake. In addition, the risk of SI appears to be higher for swimmers entering the water on days with onshore winds, and during the morning hours.