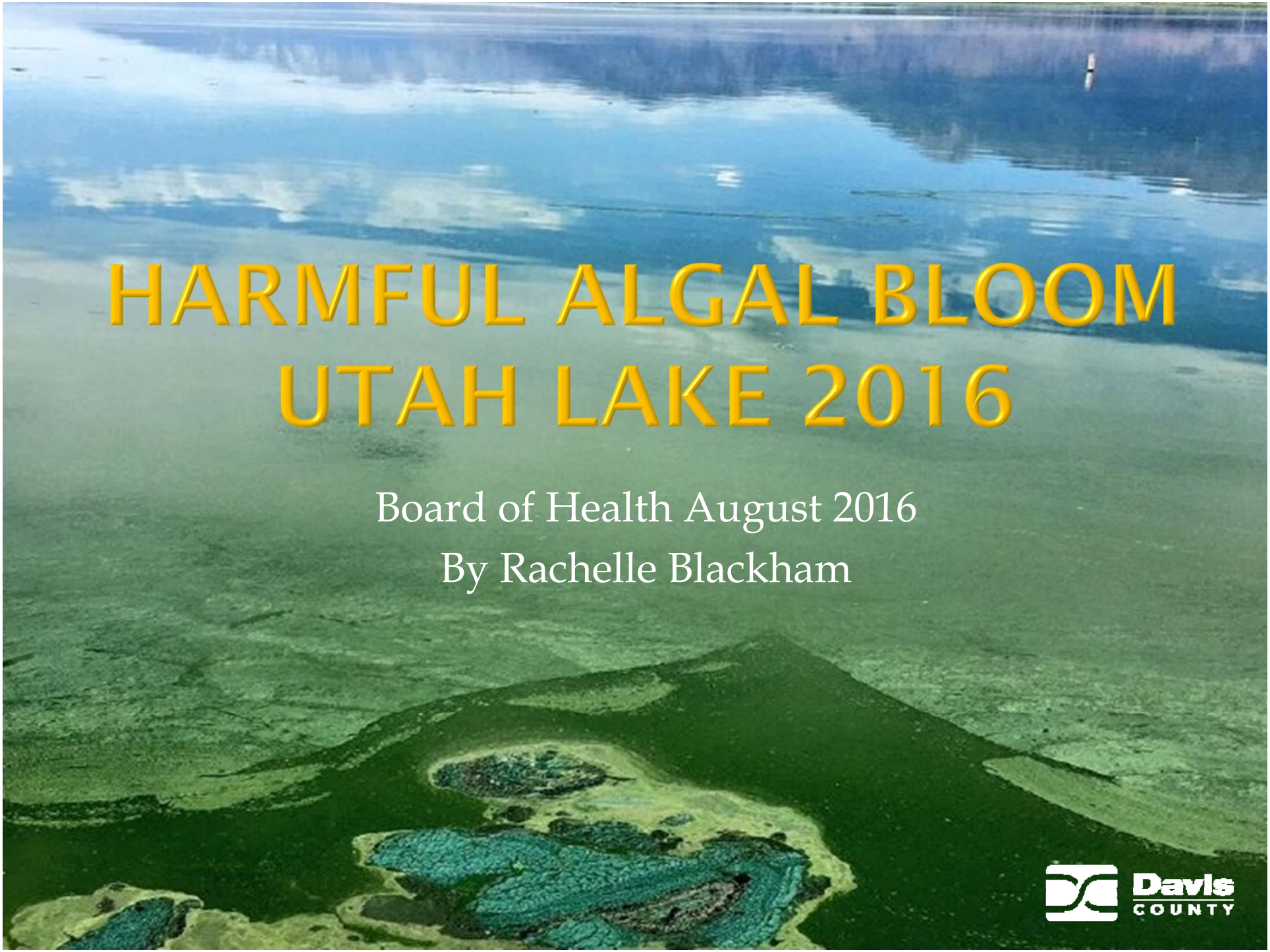

HARMFUL ALGAL BLOOM
UTAH LAKE 2016
Board of Health August 2016
By Rachelle Blackham
Davis
COUNTY

Harmful Algal Bloom (HAB) Basics

- What are harmful algal blooms?
  - Cyanobacteria (aka blue-green aglae) rapidly multiplies creating a bloom.
  - Cyanobacteria can produce potent cyanotoxins that pose serious health risks to humans and animals.
- What causes HABs?
  - High nutrients (phosphorus), sunlight, warm water and stagnant or slow moving waters.
- Health Concerns with HABs?
  - Contact with high cell density counts.
  - Production of cyanotoxins- (hepatotoxins) Mircocystins, Cylindrospemopsins, (neurotoxins) Anatoxins and Saxitoxins.

Algal Bloom of 2014

- October 2014
  - Report that dog dies
  - Samples were taken
  - Warning Signs were posted
- Resulted in Utah Guidance for Local Health Departments: Harmful Algal Blooms and Human Health
  - Standards for Blue-Green Algae (Cell Density)
  - When and what signage to post

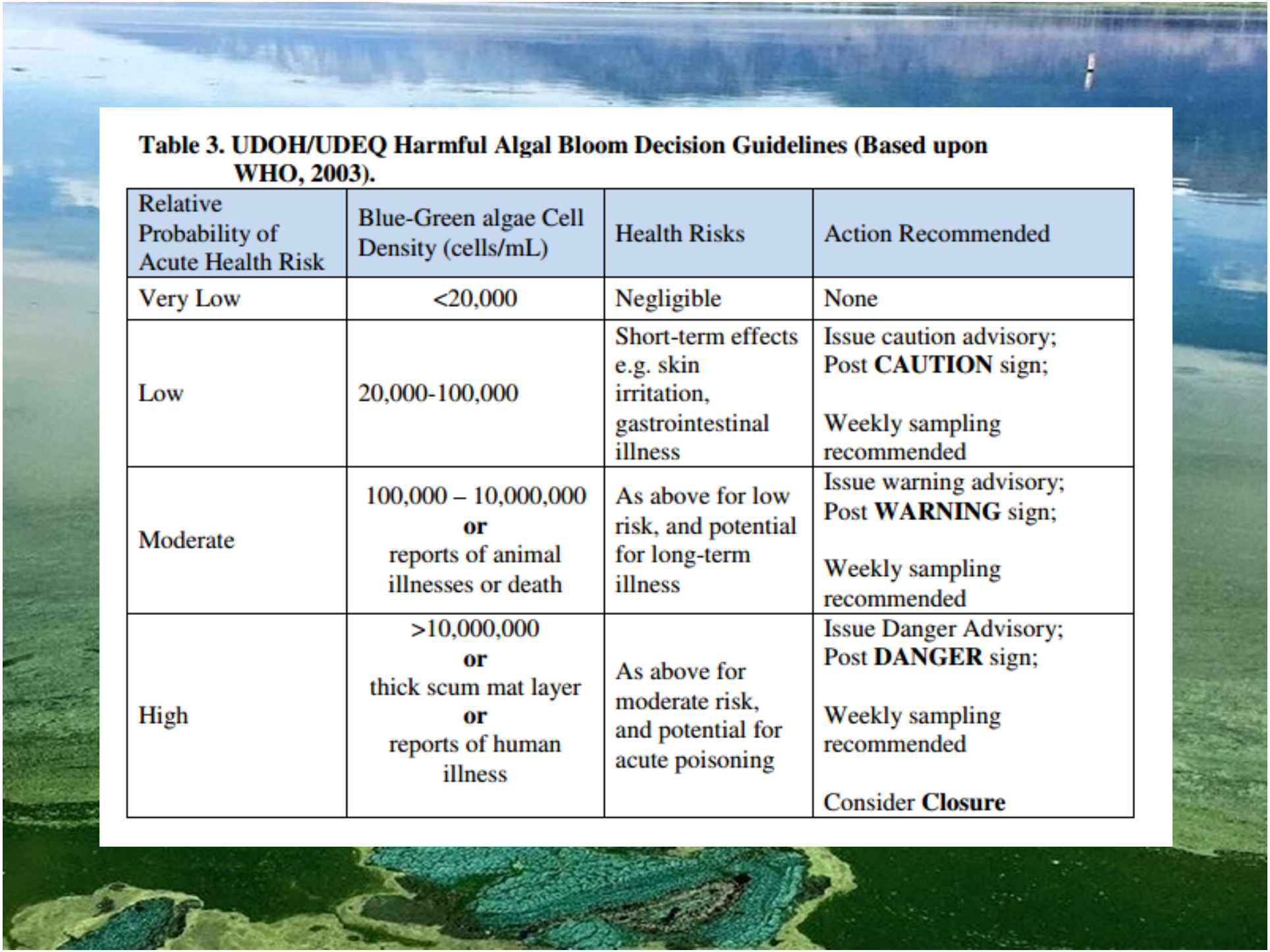


Table 3. UDOH/UDEQ Harmful Algal Bloom Decision Guidelines (Based upon WHO, 2003).

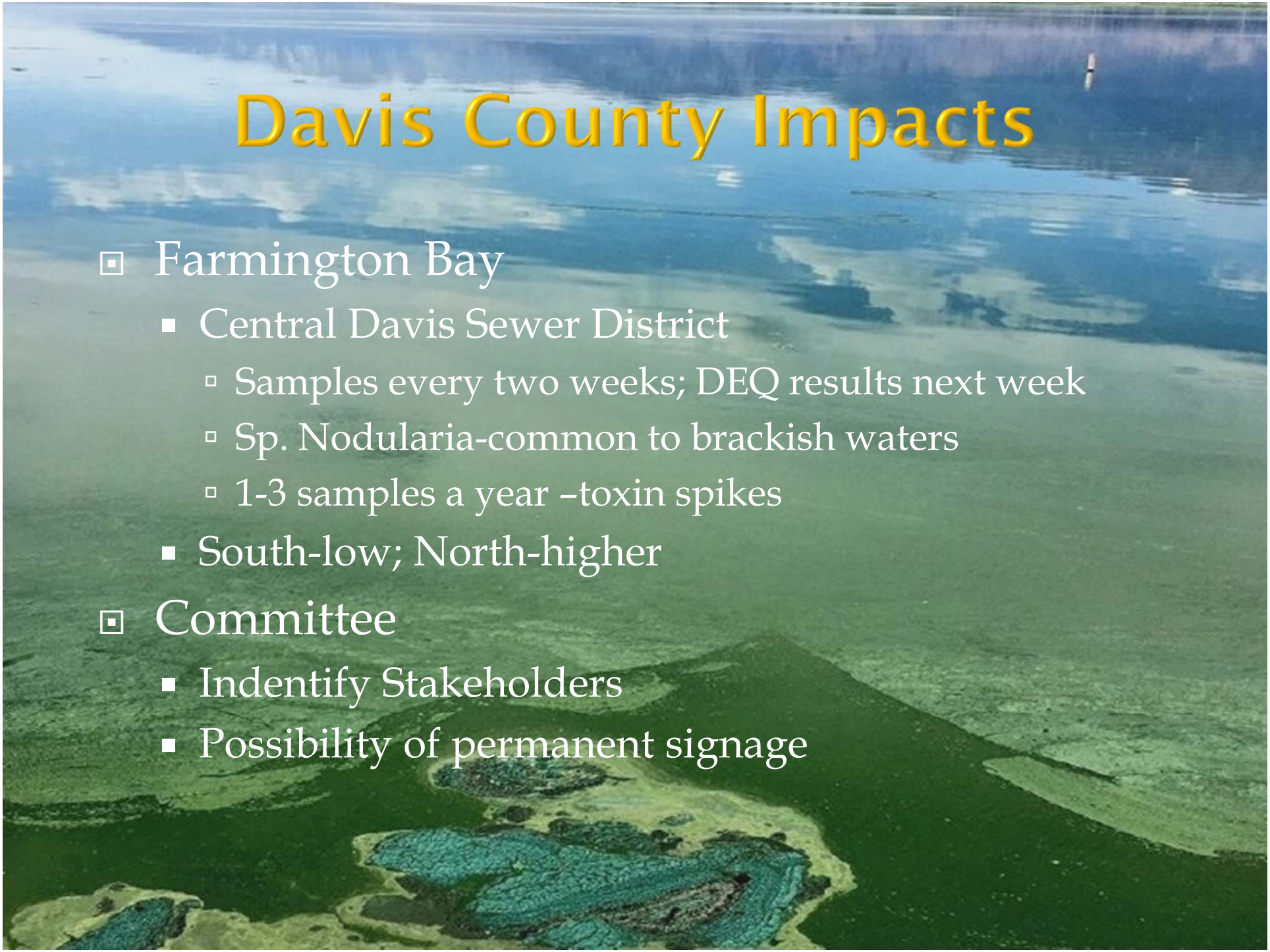
Relative Probability of Acute Health Risk	Blue-Green algae Cell Density (cells/mL)	Health Risks	Action Recommended
Very Low	<20,000	Negligible	None
Low	20,000-100,000	Short-term effects e.g. skin irritation, gastrointestinal illness	Issue caution advisory; Post **CAUTION** sign; Weekly sampling recommended
Moderate	100,000 – 10,000,000 **or** reports of animal illnesses or death	As above for low risk, and potential for long-term illness	Issue warning advisory; Post **WARNING** sign; Weekly sampling recommended
High	>10,000,000 **or** thick scum mat layer **or** reports of human illness	As above for moderate risk, and potential for acute poisoning	Issue Danger Advisory; Post **DANGER** sign; Weekly sampling recommended Consider **Closure**

WHO Recommendations

- The World Health Organization (WHO) established three types of human health based indicators for HABs: cyanobacteria cell counts, cyanotoxin concentrations and algae growth measured as chlorophyll-a concentrations.

Relative Probability of Acute Health Effects	Cyanobacteria (cells/mL)	Microcystin-LR (µg/L)	Chlorophyll-a (µg/L)
Low	< 20,000	<10	<10
Moderate	20,000-100,000	10-20	10-50
High	100,000-10,000,000	20-2,000	50-5,000
Very High	> 10,000,000	>2,000	>5,000


2016 Timeline
13
Received Call;Samples Taken
15
Utah Lake Closed; sp.Aphanizomenon; 36M/mL
16
Sampling (Jordan River); UDAF Strong Advisory; UPCC 300 calls
17
SLCoHD "Warning" signs; 2nd Water Advisory; sp. Dolichospermum; Lincoln Harbor 43.5M/mL; 100 dead ducks
20
Davis County samples come back low
21
Samples Taken; Toxin results 90% below threshold
22
Sign change to "Warning"; Scofield Reservoir complaint
28
Reopen of Utah Lake; "Warning" Signs



Davis County Impacts

- Farmington Bay
  - Central Davis Sewer District
    - Samples every two weeks; DEQ results next week
    - Sp. Nodularia-common to brackish waters
    - 1-3 samples a year –toxin spikes
  - South-low; North-higher
- Committee
  - Indentify Stakeholders
  - Possibility of permanent signage


Questions ?