



January 25, 2023

To: Sara Strassman
From: Carter Borden, Dan Dauwalter, Kent Johnson
Regarding: TU Angler Science Activities in 2022: A Summary of WiseH2O App Usage in the Driftless Area

Memorandum

Following a successful pilot project conducted by the Kiap-TU-Wish Chapter in Pierce County, WI in 2019, the Trout Unlimited (TU) Angler Science Program with the WiseH2O App expanded to the entire Driftless Area in 2020-2022. The goal of the program is to engage anglers and TU Chapters to become more informed and collect actionable data on Driftless Area trout streams. This 2022 Activities Report provides an overview of the program's activities and effectiveness at collecting data and engaging anglers and Driftless Area TU Chapters towards the goal.

WiseH2O App Observations

Since inception of the Angler Science Driftless Area Program in 2019, 1062 observations have been made in the Driftless Area using the WiseH2O App. During the 2020-2022 seasons, this number was 1002 (Table 1). Of the 451 observations made in 2022, 86 occurred during the "September Sampling Blitz" contest used to effectively encourage participants to make observations during the last part of the fishing season (see below). Prizes consisting of TU-branded swag were awarded to randomly selected participants.

Table 1. 2019-2022 WiseH2O App observations and the associated data reported

Table with 9 columns: Year, Observations, Water Source, 5n1 Test Strip, 2n1 Test Strip, Phosphorus Test Strip, Stream Temp., Stream Disturbances, Current Conditions. Rows include data for 2019, 2020, 2021, 2022, and a summary for 2020-22, plus a percentage of total samples section.

*Due to further editing of the database, the number of observations in 2019 does not match the number reported in the 2019 and 2020 annual reports.

When making an App observation, users can report from one to all the data types in the App including: water source, 5n1 test strip, 2n1 test strip, phosphorus test strip, stream temperature, stream disturbances (present/absent), and current stream and recent weather conditions (Table 1). During the 2022 season, anglers consistently reported most data types, with the lowest category being stream disturbances at 77%. These percentages of use by category have increased between 1-8% for each category as compared to the 2021 use percentages, indicating that observers are becoming slightly more likely to fill in each data type when submitting an observation.

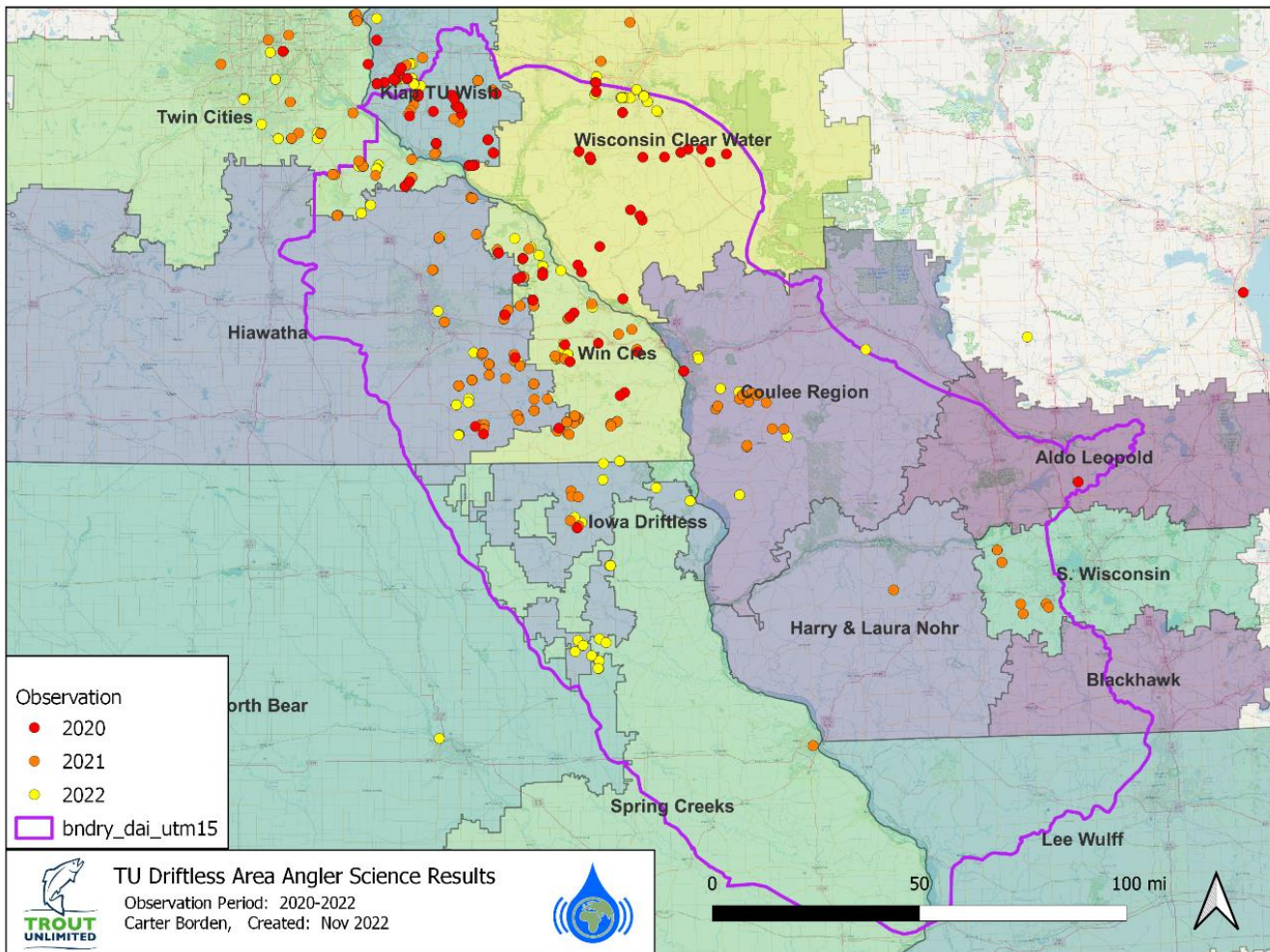


Figure 1. 2020-2022 TU Angler Science Program observations made in the Driftless Area by year and TU Chapter domains.

To date, observations have primarily been in the northern half of the Driftless Area (Figure 1, Table 2). The TU Chapter domains with the most observations during the 2020-2022 period include, in order: Kiap-TU-Wish, Twin Cities TU, Hiawatha, Win Cres, and Wisconsin Clear Waters. 2022 saw a notable expansion of activity in the Iowa Driftless TU Chapter domain. Better engagement strategies are needed for southwest Wisconsin and northeast Iowa chapters. Also, while observations are summarized by TU chapter domains, we recognize that some of the observations in a chapter domain are made by members of other chapters, such as those in the Chicago, IL area (e.g., Oak Brook Chapter) that often visit the Driftless Area to fish and submit WiseH2O observations while fishing.

Table 2. App observations made within TU Chapter domains

Organizations	2020 Observations	2021 Observations	2022 Observations	Total Observations
Aldo Leopold	1	0	0	1
Blackhawk	0	0	0	0
Coulee Region	11	14	10	35
Harry & Laura Nohr	0	1	0	1
Hiawatha	8	105	60	173
Iowa Driftless	1	7	20	28
Kiap-TU-Wish	65	91	184	340
Lee Wulff	0	0	0	0
North Bear	0	0	4	4
Southern Wisconsin	0	8	0	8
Spring Creeks	0	1	3	4
Twin Cities	4	109	110	223
Win Cres	12	50	31	93
Wisconsin Clear Waters	40	21	26	87
Other/Unknown Affiliations*	2	0	3	5

Trout Streams/Brook Trout Streams

With Brook Trout being the only native trout in the Driftless Area, conservation of this species and protection and restoration of streams that support them is a high priority for Trout Unlimited and TUDARE. In 2020-2022, WiseH2O App users were encouraged to make observations on Driftless Area Brook Trout streams, to better characterize their water quality and habitat. Of the 1002 observations submitted in the 2020-2022 seasons, 969 (97%) have been on trout streams and 369 (37%) have been on Brook Trout streams (Figure 2).

WiseH2O App Observer Participation

Since the beginning of the Angler Science Driftless Area Program in 2019, 121 unique observers have participated, with 106 unique observer IDs (given when users first log into the App) making observations in 2020-2022 (Table 3). The number of observers has increased each year since the program inception, with 61 active observers submitting observations in 2022. While the number of active observers increased, the number of new observers decreased by 23%. The increase in active observers and slight decrease in new observers indicate that existing observers remained in the program with greater frequency than previous years.

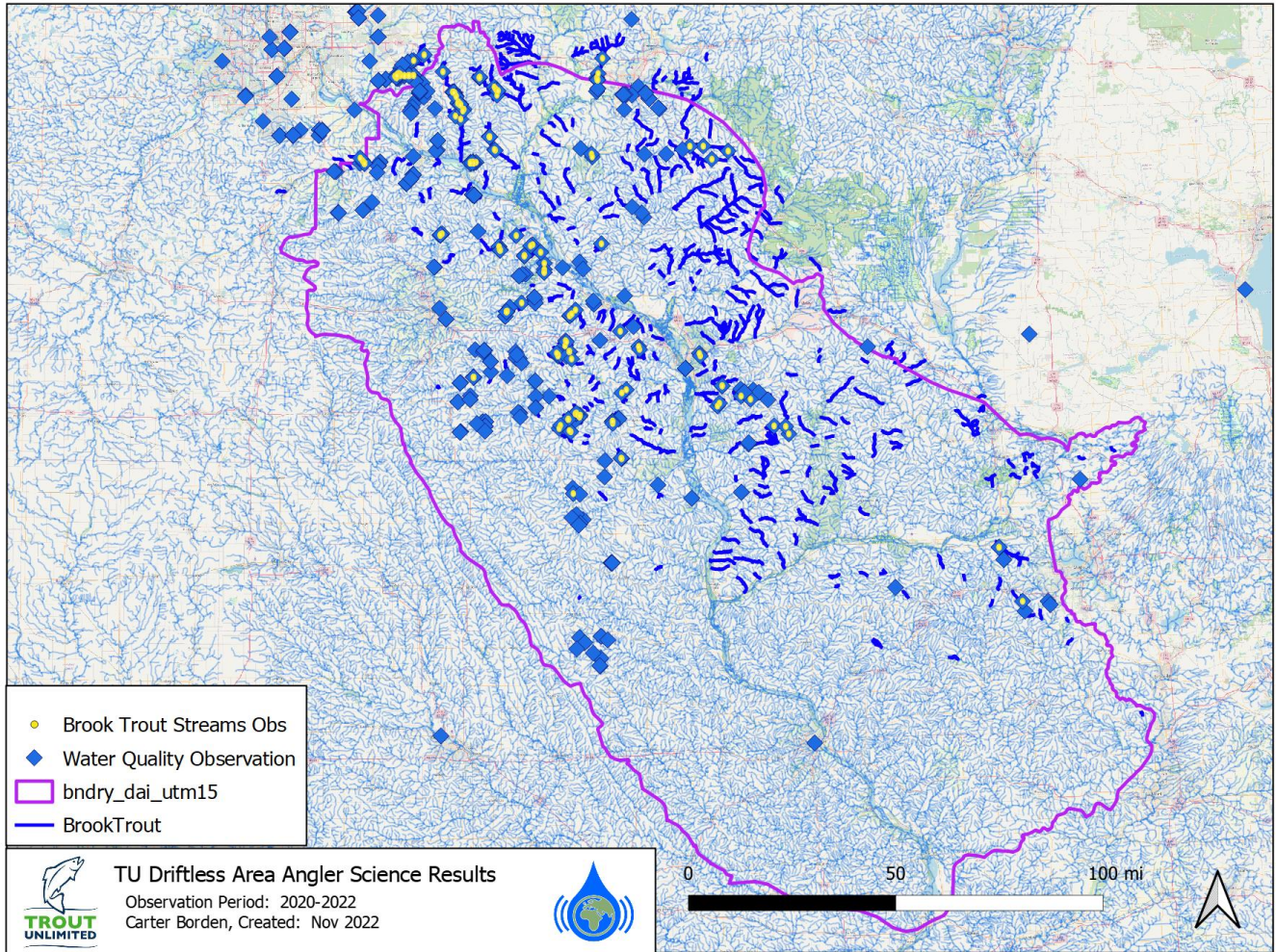


Figure 2. 2020-2022 TU Angler Science Program observations made in the Driftless Area, and the subset of observations made on Brook Trout streams.

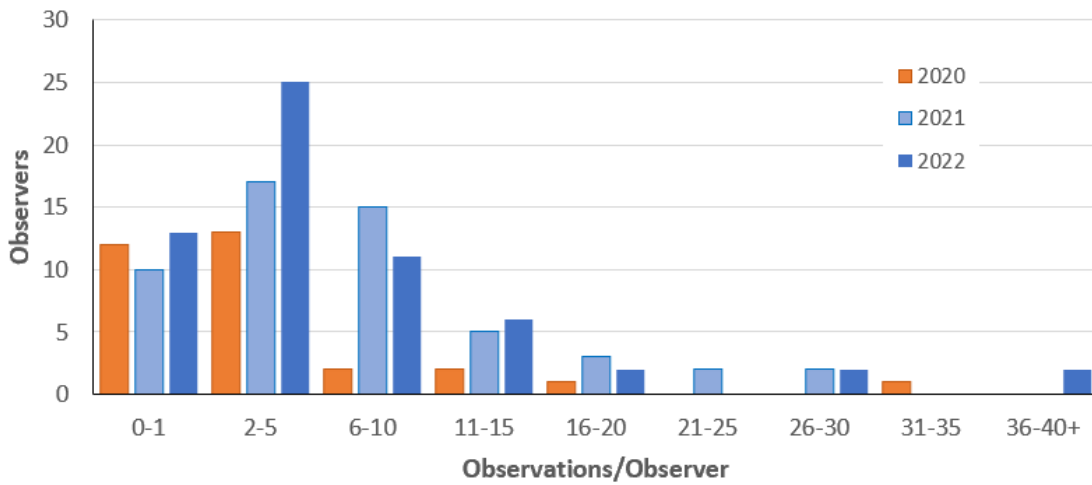


Figure 3. Frequency of observations per observer from the 2020-2022 TU Angler Science Program seasons

Table 3. 2019-2022 WiseH2O App observers per year in the Driftless Area

Year	Active Observers	Change from Previous Year	New Observers	Change from Previous Year	Observations/Observer	Change from Previous Year
2019*	16	-	16	-	3.8	-
2020	31	94%	30	88%	4.6	21%
2021	54	74%	43	43%	7.5	63%
2022	61	13%	33	-23%	7.4	-1%

*Large turnover between 2019 to 2020 likely due to the change of App download from manual to free access through the Play Store/Apple Store

In addition to gaining observers, each observer (on average) submitted more observations in 2020-2022, indicating greater involvement with the program. In 2020, observers made 4.6 observations/observer (Table 3), with most collecting under 5 observations throughout the season (Figure 3, Table 3). In 2021, the average increased to 7.5 observations/observer, with many more observers making up to 10 observations and several dedicated individuals making 26-30 observations during the season. The numbers held constant in 2022, with the average decreasing slightly to 7.4 observations/observer.

TU Chapters and Other Organizations

In the 2019 pilot year of the Angler Science Driftless Area Program, the Kiap-TU-Wish TU Chapter had 16 observers who submitted 82 observations¹. During the 2020-2021 seasons, 9 of 15 TU Driftless Area chapters participated in the program, including the Kiap-TU-Wish Chapter. Table 4 shows these participating chapters, including the annual numbers of observers and observations by each chapter. Of note, during the 2021-2022 seasons, the **Kiap-TU-Wish**, **Twin Cities TU (TCTU)**, and **Hiawatha Chapters** fully embraced the program, setting up monitoring plans and organizing the involvement of 10+ members per chapter. 2022 saw an expansion of the TU Angler Science Program with observations made in the Coulee Region, Iowa Driftless, Wisconsin Clear Waters, and Win Cres TU Chapter domains.

Table 4. TU Chapters participating in the TU Angler Science Program in 2020-2022

Organizations	2020		2021		2022	
	Observers	Observations	Observers	Observations	Observers	Observations
TU Chapters						
Aldo Leopold	1	1	0	0	0	0
Blackhawk	0	0	0	0	0	0
Coulee Region	0	0	1	8	10	10
Harry & Laura Nohr	0	0	1	2	0	0
Hiawatha	1	2	10	118	60	60

¹ Due to further editing of the database, the number of observations in 2019 does not match the number reported in the 2019 and 2020 annual reports.

Organizations	2020		2021		2022	
	Observers	Observations	Observers	Observations	Observers	Observations
TU Chapters						
Iowa Driftless	1	1	0	0	20	20
Kiap-TU-Wish	19	90	11	97	0	184
Lee Wulff	0	0	0	0	0	0
North Bear	0	0	0	0	1	4
Oak Brook	1	2	1	1	0	0
Southern Wisconsin	0	0	1	1	0	0
Spring Creeks	0	0	0	0	3	3
Twin Cities (TCTU)	1	4	15	118	24	110
Wisconsin Clear Waters	2	10	0	0	4	26
Win-Cres	1	6	0	0	7	31
Other						
Other/Unknown Affiliations*	5	29	14	60	2	3

*Includes staff from Minnesota DNR, Wisconsin DNR, and USFWS

WiseH2O App Test Kit Distribution

TU Chapters were not supplied with free WiseH2O App test kits in 2022. TU Chapters and individuals purchased the test kits through the MobileH2O website (<https://www.mobileh2o.com/shop>).

Education, Promotion, and Training

With the departure of Kent Johnson from the project after 2021, the TU Angler Science Driftless Area Program was promoted in 2022 through presentations and workshops (including the 2022 Driftless Area Symposium and Wild Trout Symposium), online presentations, announcements and articles on social media, the program website, 2022 September Blitz, and email notifications (Table 5). In addition, Kent Johnson and Carter Borden fielded questions from emails and phone calls about the program and technology throughout 2022. Jeff Hastings also retired in Spring 2022, and Sara Strassman was hired in place of Jeff but didn't start until mid-July. Finally, in September 2022, a "September WiseH2O Water Quality sampling blitz" with an accompanying competition was organized, which yielded 86 observations from 27 individuals, 6 of whom were new to the program. Prizes were randomly awarded to three of the 27 participants.

Table 5. 2020-2022 promotional activities for the TU Angler Science Driftless Area Program

Event	Media	Date
2020		
Monitoring Water Quality with the WiseH2O Mobile App: Trout Unlimited (Kiap-TU-Wish) Pilot Project	Webinar	Jan 16
Meeting with Minnesota and Wisconsin DNR Staff	Meeting	Feb 3
2020 Driftless Area Symposium	Presentation/Information Booth/Workshop	Feb 4-5
WiseH2O Training/Angler Science Program Overview	Webinar	May 26
WiseH2O Training/Angler Science Program Overview	Webinar	Sep 10
American Fisheries Society Virtual Annual Meeting	Poster (Virtual)	Sep 14-25
2021		
Webinar on WiseH2O App, for 2021 Driftless Area Rollout	Webinar	Mar 31
WiseH2O App training session with Hiawatha Chapter	Training	Apr 3
WiseH2O App training session with TCTU Chapter	Training	Apr 27
September 2021 WiseH2O Water Quality Blitz	Email, website	Sept
2021 American Fisheries Society Annual Meeting	Poster	Nov 6
2021 Trout Unlimited Science Symposium (Virtual)	Poster	Dec 16
2022		
Driftless Area Symposium (Virtual)	Presentation	Mar 3
Wild Trout Symposium	Poster	Sep 27-30

WiseH2O App Technology Updates

For the 2022 season, the App itself only corrected errors. The primary technology updates were backend storage and recalibration of the colorimetric algorithm for NO₃.

Supporting Implementation Infrastructure and Services

The 2022 program effort primarily built upon and updated the supporting services developed in 2021. Specifically, the following efforts were implemented:

1. Training materials were updated and expanded to support the use of the updated WiseH2O App. Training materials include a written user manual and an instructional video, allowing users to learn how to use the App via self-training. These documents can be found at <https://www.mobileh2o.com/mh2oapp>, and the written document is also available through a link on the WiseH2O App (Preferences=>Tutorials).
2. The introductory webpage that serves as the base landing website for information about the TU Angler Science Driftless Area Program (<https://www.mobileh2o.com/driftlessprogram>) was kept current (Figure 4).

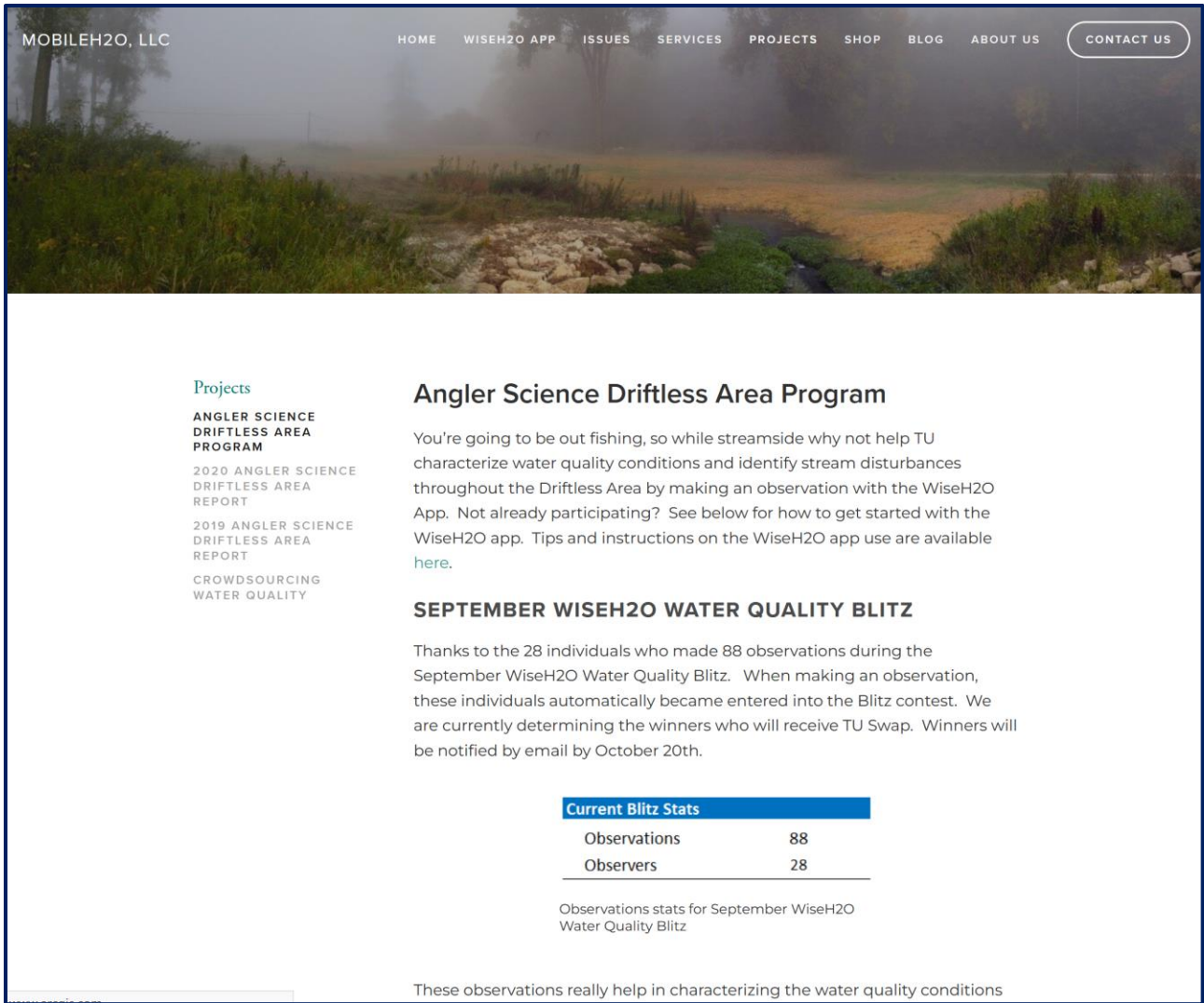


Figure 4. Webpage for the 2022 TU Angler Science Driftless Area Program

Driftless Area Scorecards

To promote water quality awareness, provide participating anglers with feedback on their efforts, and inform TU members of issues being addressed by TU Chapters, a Driftless Area Score card is being produced. The front page is an overview of the conditions across the Driftless Area (Figure 5), based on fish health and habitat condition. The back page provides information on the specific water quality issues (nutrients, water temperature, stream disturbances) and restoration potential within each chapter domain. Before distribution of the 2022 Score Card, weighting of categories and messaging need to be further refined based on TU's guidance and preferences.

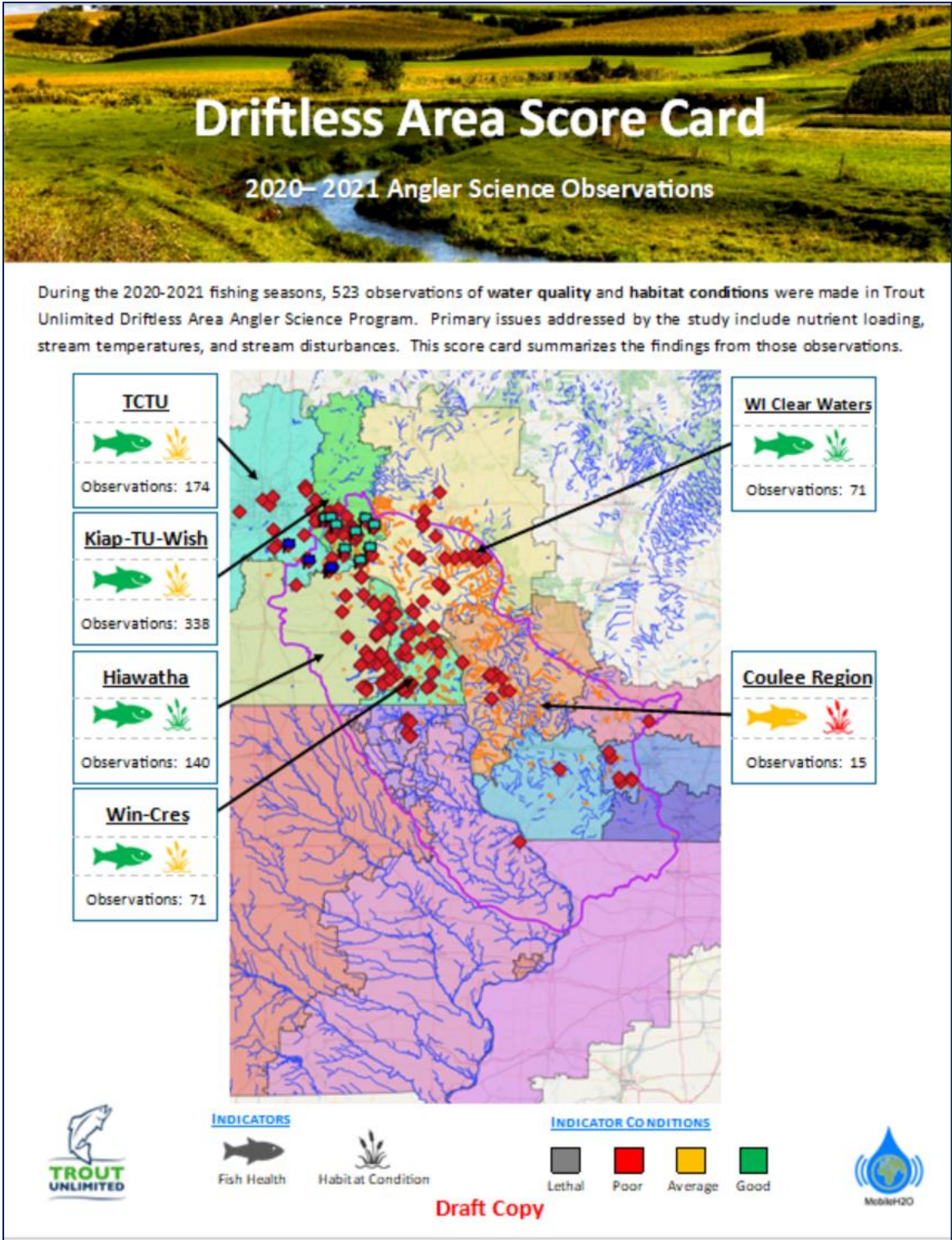


Figure 5. Front page of the TUDARE Driftless Area Score Card, based on WiseH2O App data

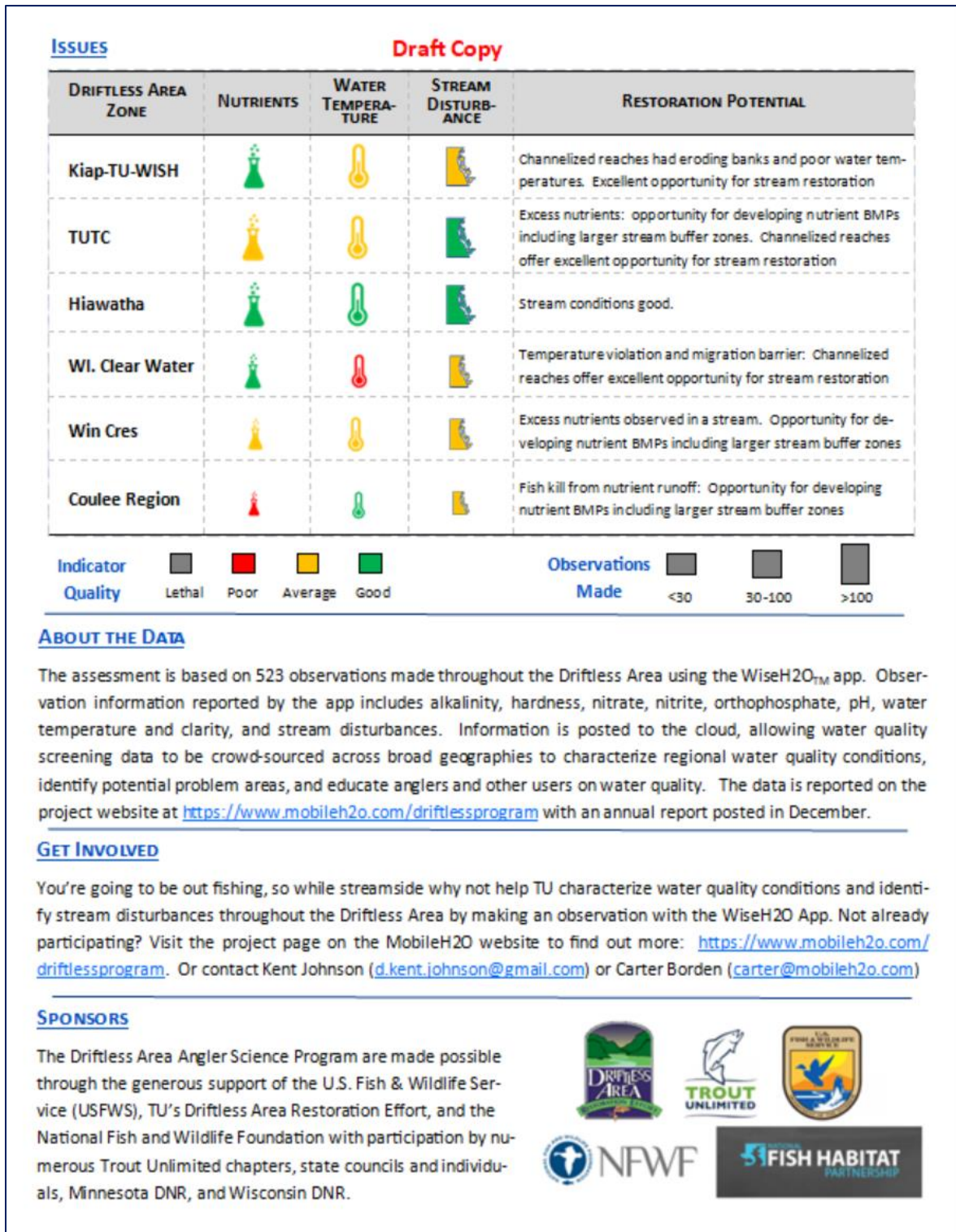


Figure 6. Back page of the TUDARE Driftless Area Score Card, based on WiseH2O App data