

RESOURCE KNOWH₂OW

The R&A Water Security Index 2026.

Hosted by The R&A and The Environmental Partnership (TEP).

A golfer in a dark blue shirt and shorts is watering a green on a golf course. A long yellow hose is coiled around the green, and a spray of water is being directed at the grass. The golfer's shadow is cast on the grass. In the bottom right corner, there are several wavy, teal-colored lines.

Water Security Index (WSI) – Origins.

Championship Venues –
Requirement to demonstrate sustainability,
long term resilience including water reduction.

- Empirical metric designed to highlight vulnerabilities, strengths and recommended actions
- Golf Course 2030 – Prepare golf for future impacts
- WSI – Ideal metric to utilise on wide range of golf courses to increase resilience to future climate and regulations



Water Security Index.

Category	Items	Contribution to Score
1. Irrigation system	Age, pipework, pumps, heads, redundancy, auditing and servicing	15%
2. Water source	Future availability, sustainability, reliability, quality	20%
3. Water storage	Drought resilience, storage in days, strategy and engagement	20%
4. Agronomic practices	Moisture management, mapping, agronomic practices	15%
5. Consumption, application and resilience management	Current use, planning, budgeting, drought plans, monitoring	20%
6. Education and clubhouse use	Water champion, members involvement, water use and plans, knowledge and awareness	10%

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Water Security Index.

Scoring Range (%)	Water Security and Resilience Status
85-100%	Water security at forefront of Venues strategy with excellent management systems. No issues with long term water supply, irrigation system and management. Look to maintain current system and constantly review.
70-84%	Venue is water secure. Small upgrades to management and strategy document may be required but overall water supply and storage is sustainable and secure.
60-69%	Venue is water secure. Water supply may have some longer-term security issues and may need alternatives to be investigated. Upgrades to water management and strategy documents required to ensure that site has an up to date integrated and consistent plan. Clubhouse water reduction may need further investigation.
50-59%	Venue relatively water secure. Likely to have secure/sustainable water sources, but additional onsite storage capacity, water quality testing or alternative back up sources of water may be required. Additional help with course wide water system masterplans, clubhouse water reduction, drought and disaster mitigation may be needed.
40-49%	Venue at risk of water related issues. Plans will be needed to assess and address water security to make clear integrated plan to reduce water risk to Venue.
25-39%	Venue at high risk of water related issues. Likely to have inconsistent or unsecured water supply. Need review of whole site and a clear plan for reducing risk to Venue.
0-24%	Venue at extremely high risk of water related issues. No clear plan in place, inconsistent or unsecured water supply. Irrigation system in need of upgrade and staff lacking knowledge and direction in terms of water strategy.

- Score is unique to Venue
- Scale of urgency not a score to shame
- Sub-category scores to help focus attention on projects/investment
- Score to be used to benchmark and then track progress

R&A GC2030 WSI Pilot Project.

Project Details

- Used existing WSI created for R&A Championship Venues
- 5 x in person assessments
- 13 x online assessments
- 5 x additional online assessments funded by YUGC
- Total assessments = 23
- Supported by England Golf and Welsh Golf Union
- Potentially first project of this type for a sporting sector
- Large data set when combined with Championship Venues



R&A GC2030 WSI Pilot Project.

Project Objectives

- Understand if WSI created for Championship Venues is scalable/applicable for venues of different scales
- Produce significant dataset of current water security situation for golf clubs in UK
- Provide funded water security assistance and direction to Clubs as part of GC2030 project
- Data to assist R&A with deciding future sustainability themes



WSI Project Report.

Introduction

The Royal and Ancient (RAA) currently provide detailed sustainable agronomic services to all Venues which host The RAA Championship tournaments. The RAA are committed to providing sustainable golf tournaments, and as such agronomic advice is tailored to reduce inputs to promote long-term sustainability for surfaces and facilities.

Water use is a major resource requirement of golf courses. However, in order to improve sustainable use of water, golf courses cannot simply be divided to reduce use by a set percentage without consideration for the associated logistics. Water use varies geographically, as well as between years, and every golf course has different requirements.

Water security is an integrated term which describes how 'secure' and 'resilient' water sources are. Therefore, it is a much better indicator of sustainable water use. However, no industry standard for water security currently exists for the golf sector. Therefore, The RAA have commissioned TEP to create a Water Security and Resilience Index.

This assesses several water related parameters related to water sourcing, use and knowledge at The RAA Non-Championship Venues. This will allow Venues to see where they are currently vulnerable, and what needs to be achieved to improve water security, resilience and efficiency.

The Water Security and Resilience Index is composed of six main categories which cover all aspects of water sourcing, use, application and management throughout a Venue. The six categories are:

- 1. Irrigation System
- 2. Water Source
- 3. Water Storage
- 4. Application, Consumption and Management System
- 5. Agronomic Practices
- 6. Education and Clubhouses

The contribution of each of these main scoring categories to the final Venue score is weighted depending on their importance. For example Water Source (20%) has a larger impact in the final score than Education and Clubhouse (10%).

Each main scoring category is then further split into subcategories. These are also given a weighting depending on their importance, for example Water Source is split into sustainability and security of source (65%) and quality of source (35%). The full breakdown of categories and subcategories with weightings is given in Table 1.

Table 1 - The RAA Water Security and Resilience Index scoring breakdown

THE ENVIRONMENT PARTNERSHIP

Main Category	Main Category Weighting (%)	Subcategory	Subcategory Weighting (%)
1. Irrigation System	15%	1.1 Condition and age (pumps)	30
		1.2 Condition and age (pipework)	20
		1.3 Condition and age (sprinklers)	15
		1.4 Condition and age (controllers)	15
		1.5 Redundancy	15
		1.6 Auditing system	10
2. Water Source	20%	2.1 Sustainability and security of source	65
3. Water Storage	20%	3.1 Quality of source (m3)	35
		3.2 Drought resilience (days)	60
4. Application, Consumption and Resilience Management System	20%	4.1 Storage strategy and engagement	40
		4.2 Current water use	25
		4.3 Planning and budgeting	35
		4.4 Drought plan	20
5. Agronomic Practices	15%	5.1 Monitoring - Improvement for future projects	20
		5.2 Moisture monitoring	25
		5.3 Moisture delivery	25
		5.3 Agronomic practices	30
		5.4 Products	20
6. Education and Clubhouses	10%	6.1 Internal water reduction	30
		6.2 Knowledge and awareness	50
		6.3 Water sourcing	20

Site Assessment

TEP conducted its site assessment on the 18th of September 2023. The following people were present on the site visit:

- Stuart Dobbin – General Manager
- Adam Wright – Course Manager
- Tom Young – TEP
- Lee Johnson – TEP

The site visit involved a detailed discussion on various aspects of water management and sourcing for the site, followed by a short Course walk to view relevant water infrastructure.

An initial assessment was conducted by TEP, with a review session held with Gwynn Davies, TEP and Tony Hansen (ESB) to peer review awarded scores. A detailed summary of the Water Security and Resilience Index scores is given in Table 3.

A summary of the Index score and six scoring categories is given below.

THE ENVIRONMENT PARTNERSHIP

Overall Score - 47.2%

An overall score of 47.2% indicates that Camberley Heath Golf Club is not currently water secure, with a number of water security risks present.

Particularly strong aspects of Camberley Heath Golf Club's water management system include:

- New irrigation controller, with a service plan.
- Long standing agreement and good relationship with PEO who service the irrigation system.
- Regular hand watering informed by POGO measurements.
- Recent club house refurbishments with lower water usage facilities.
- Regular communication with members on what the green-keeping team are doing.

Scoring categories which may benefit from additional attention include:

- Breakdown and disaster plan for irrigation system to be formalised, including relevant contractor contacts, isolation points and agreed plan for various scenarios.
- A comprehensive water security plan should be commissioned to identify alternative water harvesting and storage opportunities.
- Digitising on-course and club-house drainage and irrigation plans to have up to date records. This would allow the Club to identify how drainage could be reused and also assist with irrigation repairs and maintenance.
- Form and adopt a drought emergency plan / water quality testing.



Photos taken on site visit

Scoring Table

Main Category	Overall score (%)	Subcategory	Individual Score (0-30)	Reason for Score	Suggested Actions
1. Irrigation System	40.9%	1.1 Condition and age (pumps)	4.5	The club operates on a dual pump system one main, and one back-up. The second pump only engages when required (low pressure). The pumps were installed during the 80s/90s system upgrade. The pipework was installed in the 50s/60s system upgrade. It was one of the first Clubs to be installed MOPF (antivets).	Complete a water security plan to include an in-house breakdown plan. Complete records digitally.
		1.2 Condition and age (pipework)	3	The full course is irrigated (11.5ha) - less, greens, approaches and fairways. Vlekways, surrounds and roughs are not irrigated. The sprinklers were installed in the 80s/90s system upgrade, but have been replaced gradually over the years, for example some sprinklers are 2 months old. Fairways are irrigated by box runs with full 360 flux heads.	
		1.3 Condition and age (sprinklers)	4.5		
		1.4 Condition and age (controllers)	10	Current system (Baldol) installed two years ago, with a service plan.	
		1.5 Redundancy	2	No in-house breakdown plan. Service plan with Baldol as controller is under warranty. The club have a service agreement and excellent relationship with PEO who visit five times a year to service the system, can be called out in emergencies and provide training. Recent case of bonhole burning out resulting in mains water reliance for two months, but money set aside for water and decisions made and approved with board on same day. All staff know the system through handed operation, manual operation of heads and hand watering, but there is no irrigation tech. Servicing left to four senior (Course Manager, Deputy First Assistant, workshop manager) members of staff. Club are keen to form a water security plan.	
		1.6 Auditing system	7	System audited once a year and PEO fully shut down and start up the system annually, providing a report with recommendations of upgrades/modifications. There are 10 staff (six younger, four senior) and the biggest job is turning heads and checking area which happens usually once a month. There is a widespread knowledge of the system, but nobody is 100% assured that wellness of installation of the 80s/90s system update. Course manager has been in position for two years, but at the club for eight. Lots of historic documents, including the original set-backs of the club, but much has changed and nothing is digital.	
2. Water Source	43%	2.1 Sustainability and security of source	9	The water source is an 80m borehole (Grundfos) with MOPF back up. The abstraction licence is for 5m ³ /hourly, 150m ³ /daily and 25,000m ³ /yearly. This can be used pre-record. The ten-year licence renewal in 2027 and the EA context recently visited the course. The EA's Modelled Abstraction Reductions National Framework for Water Resources 2023 indicates a 0% risk of abstraction reduction up to 2080. Borehole and pump (1990s) prior to current borehole burnt out this spring, resulting in mains water reliance for two months.	Continue conversations with the EA and consider running water quality tests on irrigation water.
		2.2 Quality of source (m3)	3	No water testing regime. Quality deemed okay.	

Table 3 - RAA Water security and resilience index scores for Camberley Heath Golf Club

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R&A

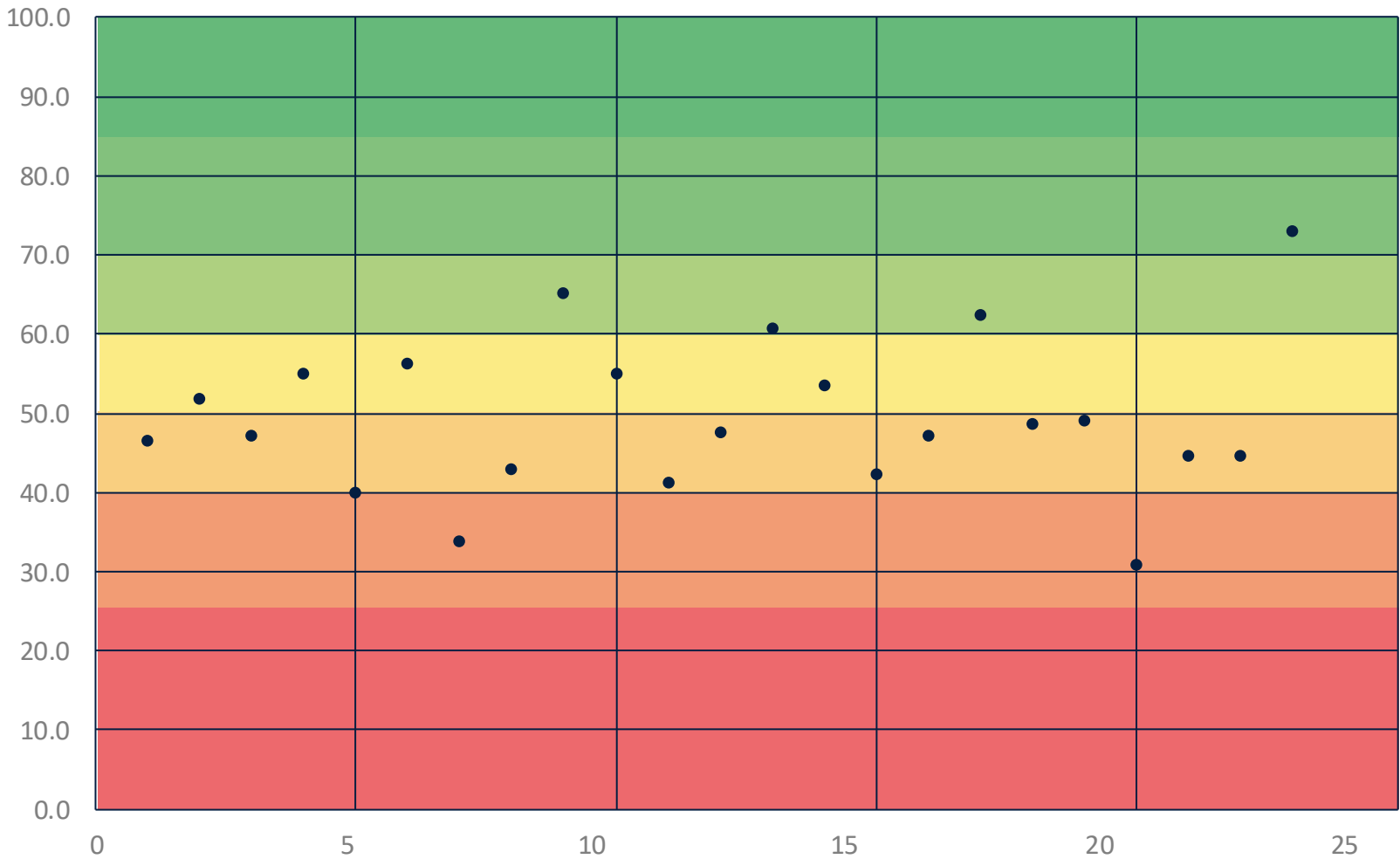
WSI Project Report.

How Clubs should use it

- Understand that report is start of process
- Use as part of wider Club discussion allowing water security to be fed into long-term course strategy
- Designed to be understood by range of audiences i.e. please share where appropriate
- Be proactive on considering recommendations and documenting response
- Help justify significant capital expenditure
- Use as baseline to cross reference against at regular intervals in future
- Constantly review

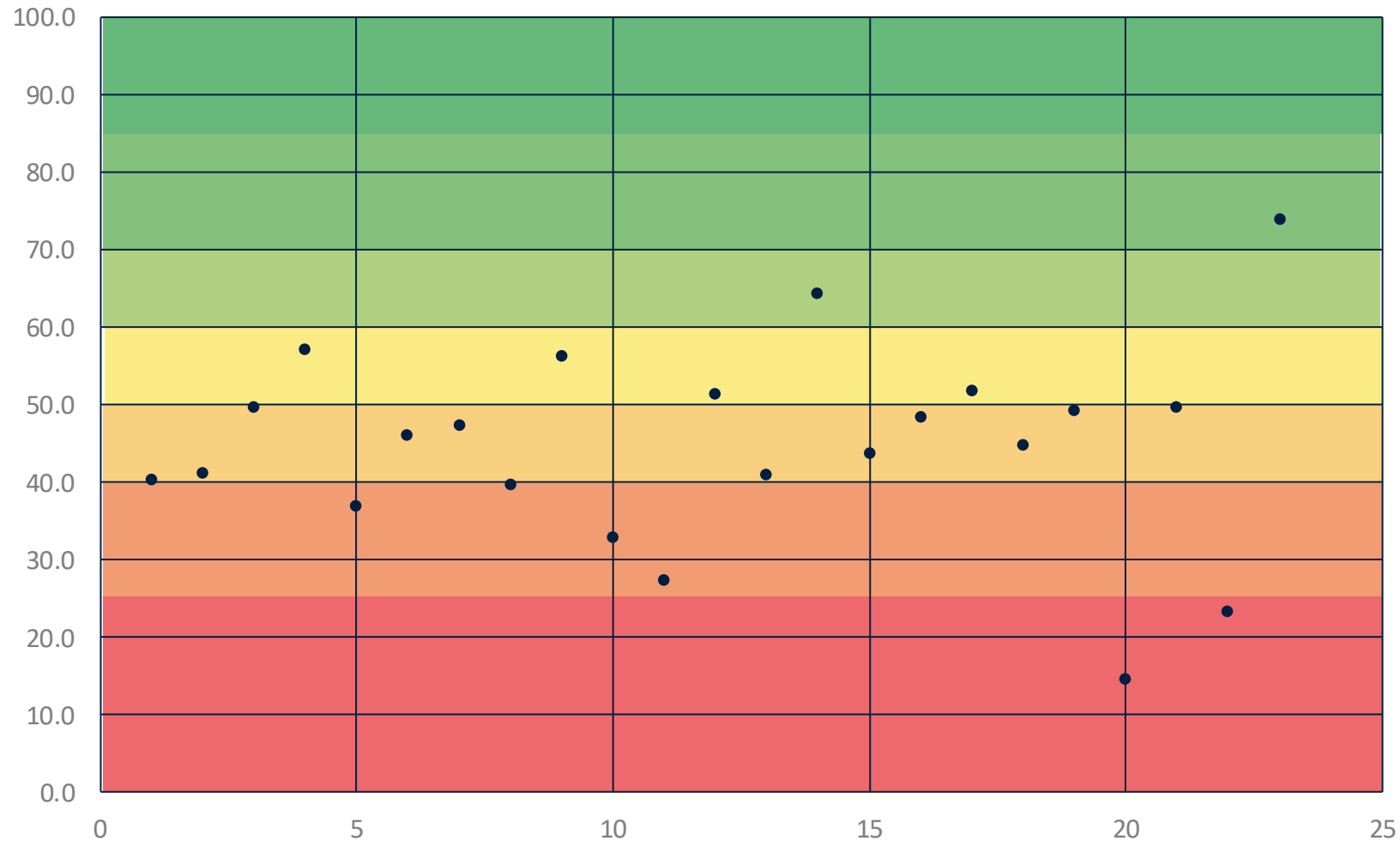


Project data – Overall Scores.



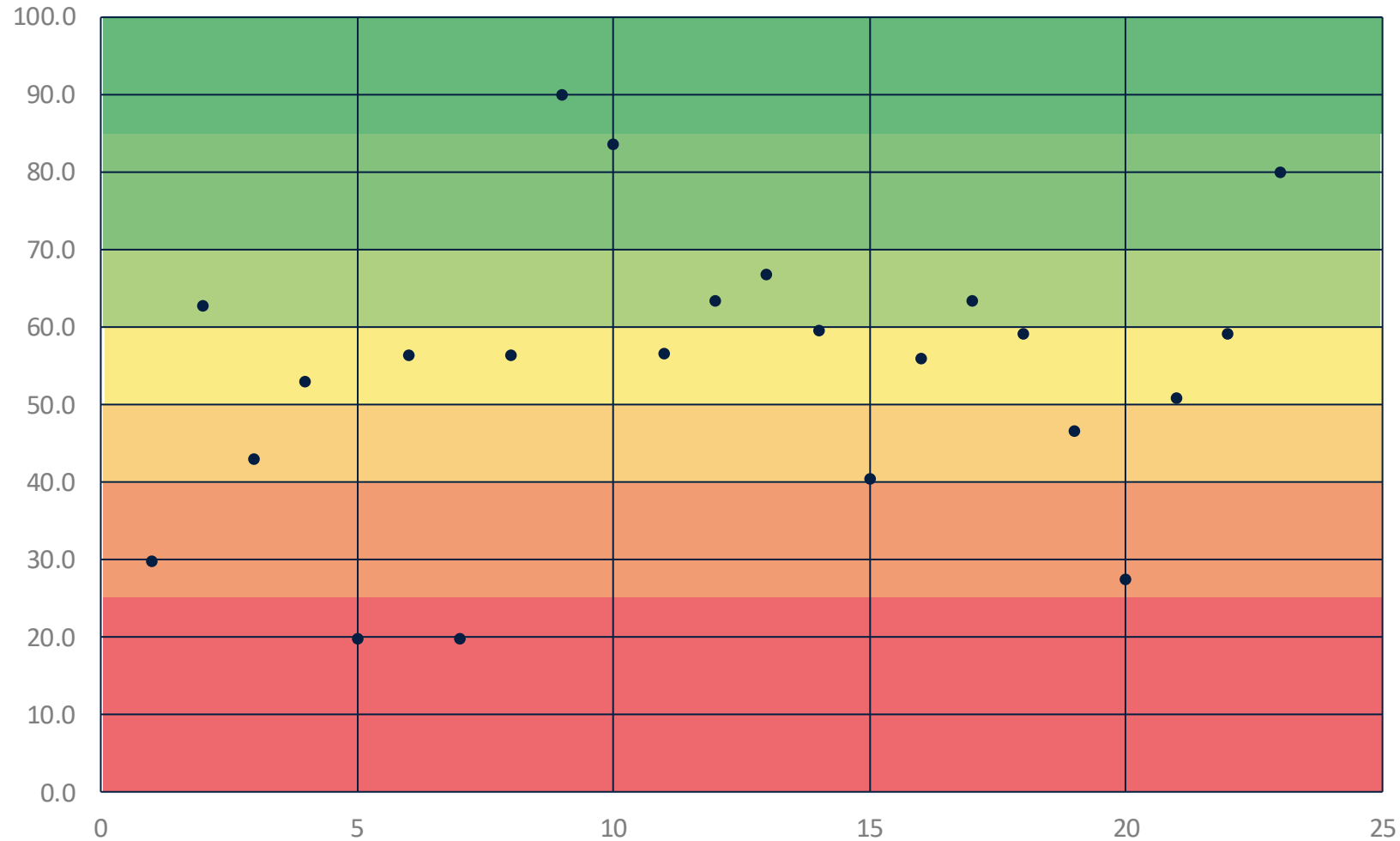
- Scores ranged from 31-73%
- Majority of Clubs within 40-55% bracket ie have a water security risk
- Aim to be within 60+%

Project data – Irrigation Score (15%).



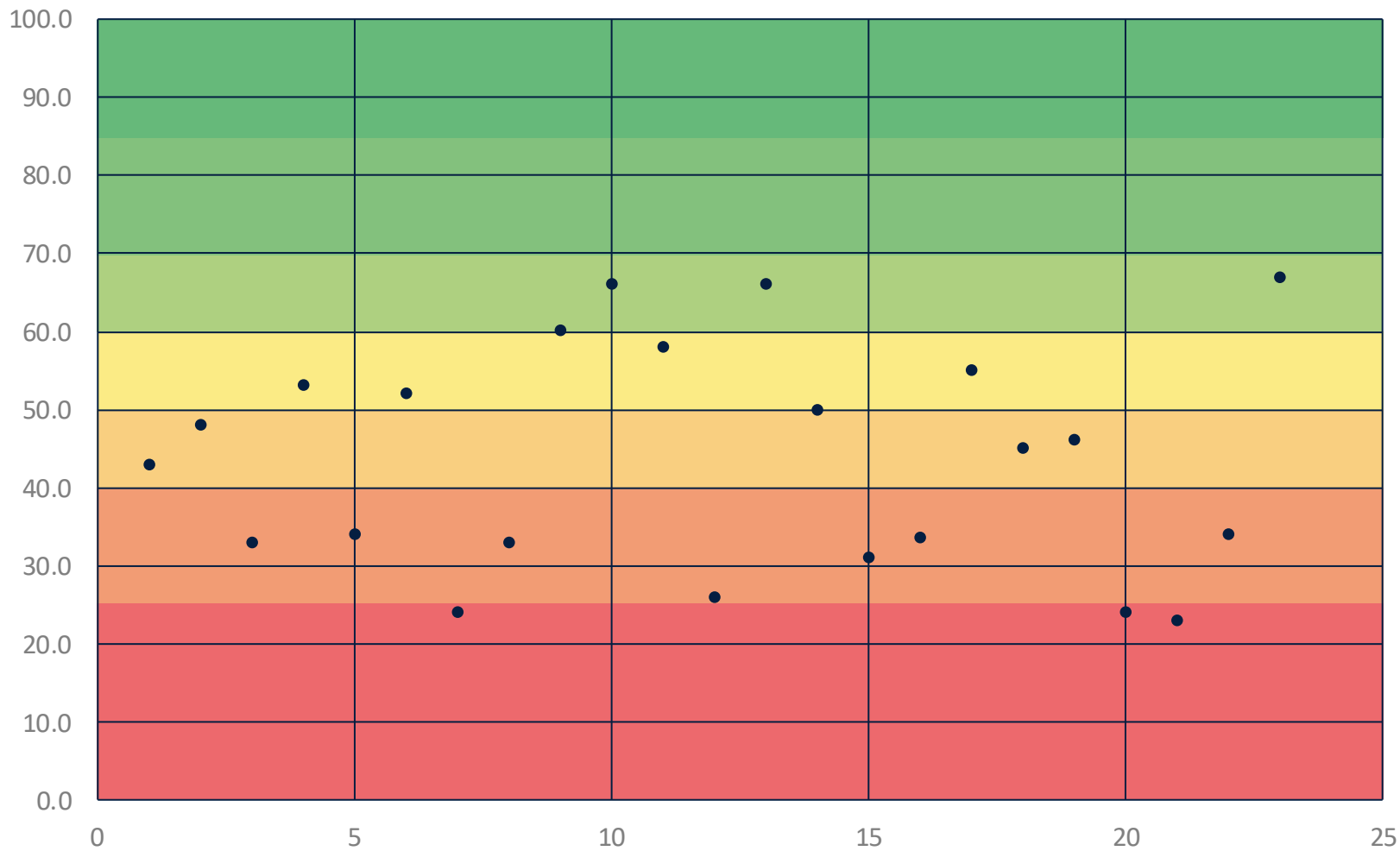
- $\frac{3}{4}$ venues less than 50% score
- Pump is heartbeat of system
- Old pump, no spare
- PVC pipe
- Lack of internal system knowledge/plans
- High reliance on contractor
- Easiest win to upgrade is controller but can create other problems – new tech incompatible with old tech

Project data – Water Source Score (20%).



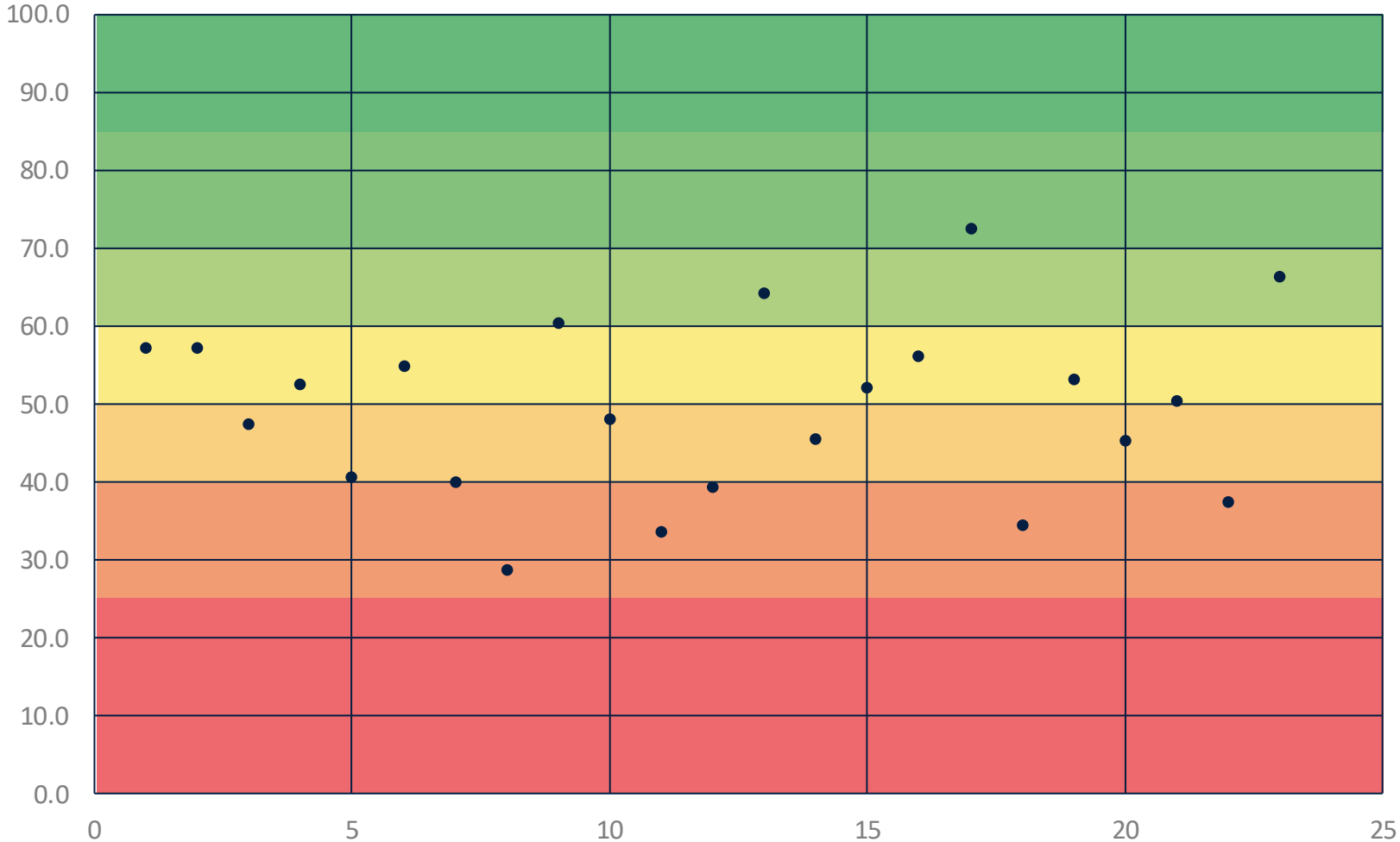
- Score driven by source of water
- Range of water sources
- Proactive approaches to sourcing water
- Future demand increase often not covered – need new sources of water
- Reduce reliance on Mains water should be priority

Project data – Water Storage Score (20%).



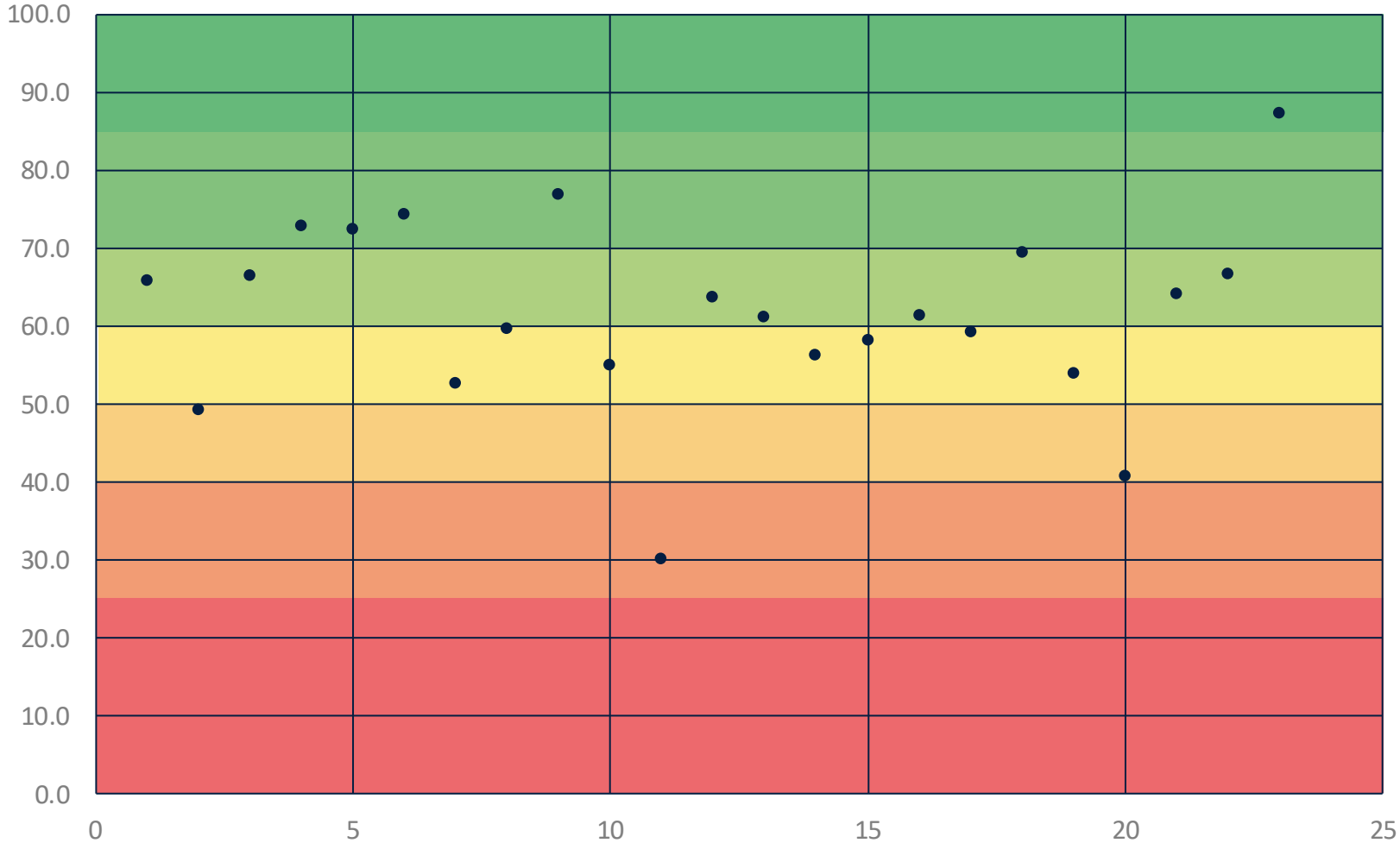
- Water stored onsite = security
- Not many venues with large storage
- Available storage potential not always fully utilised
- Large investment that needs long term planning

Project data – Application, Consumption and Resilience Management Score (20%).



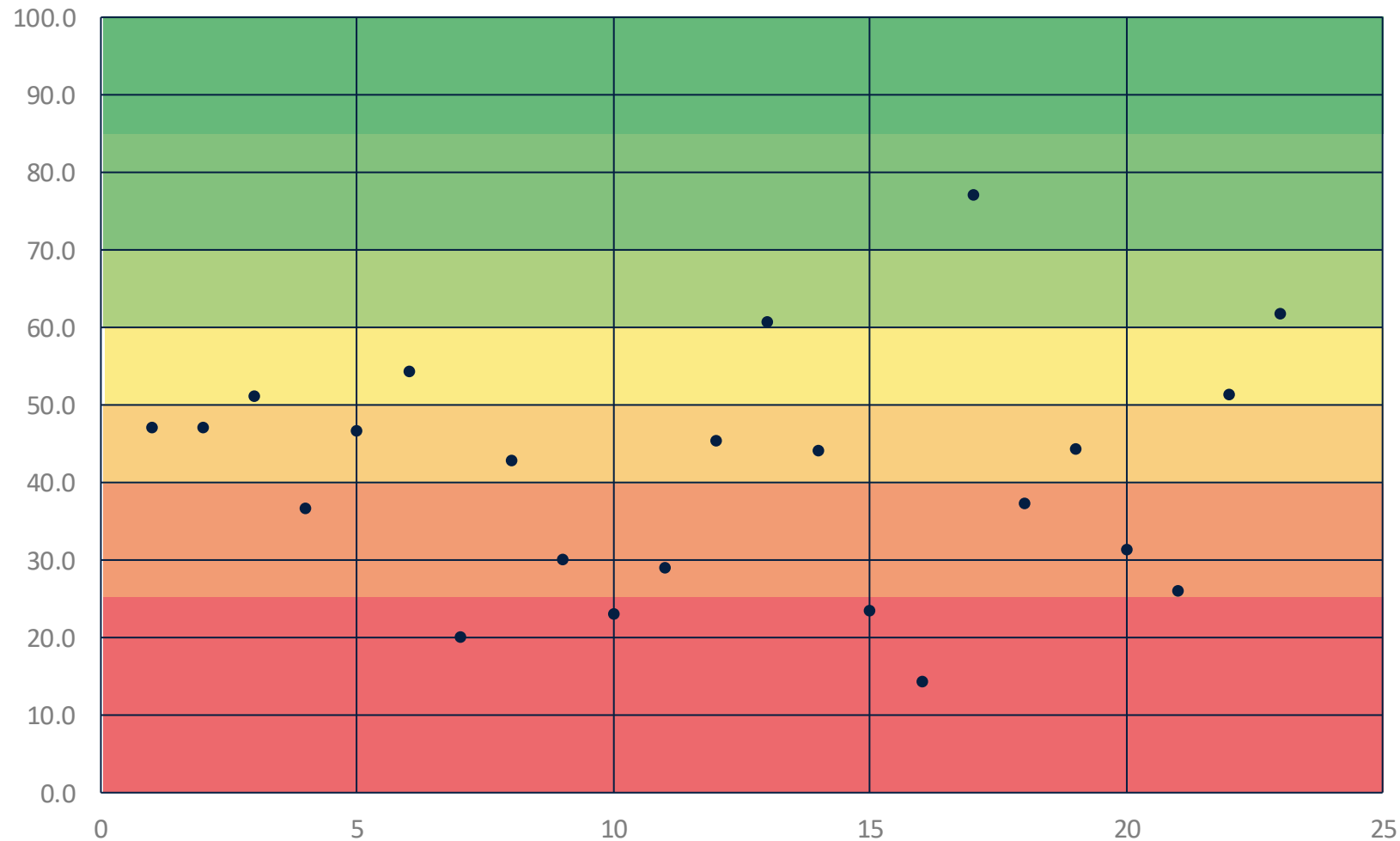
- Widest range
- Water density use useful metric to allow comparison m³ per ha of turf
- Common theme was lack of integrated long-term planning
- Lack of formal drought plans
- Lack of monitoring of water usage/accurate usage and water movement onsite
- Data is key

Project data – Agronomic Score (15%).



- Wetting agent use is very common
- Standards are generally high with good understanding
- Pressures have pushed teams to understand link between drought, resilience
- Turf management and agronomics shows proactive approach to water use – 87% above 50%

Project data – Education and Clubhouse Score (10%).



- Mains water commonly used in Clubhouse
- Membership not always invested or aware of overall risk
- Internal use generally low though – ie showers
- Internal water champions – lacking – often falls to GM or CM
- Internal; water audit – cheap option to start saving and educate patrons

Project Data Key Insights.

91%

Venues scored less than 60%
for irrigation systems

70%

Venues scored more than 50%
for water source

17%

Venues scored more than 60%
for water storage

Project Data Key Insights.

Water Use

Mains Water
Onsite Borehole –
Licensed & Unlicensed
River Abstraction
Harvested Drainage
Recycled Water

Water Storage

Number of courses
with storage ponds/reservoirs = 20%
Range of storage = 0-32,500m³
Oldest tank was over 100 years old!!
Average storage =
31.7 days (2533m³)
Average storage minus top 5 clubs =
3.8 days (265m³)

Common Themes.

Irrigation system is key to site water management and agronomics

Drought mitigation often reactive rather than proactive

Decline in shower demand i.e. Clubhouse use is usually minimal

Need for irrigation and water use training/skills set

Need for internal knowledge transfer/collation – one location

Members often oblivious to water security challenges/risks

Lack of long-term financial planning for irrigation upgrades

Clubs do understand that there is an issue and solutions do exist

Clubs can and have produced innovative solutions



Water Security Index Next Steps.

WSI works for venues of different sizes and is scalable to identify vulnerabilities.

- Online assessments work well
- Opportunity for repeat assessments to track progress
i.e. if you do nothing score will decline
- The R&A discussing how to continue scheme
- Upcoming events:
BTME session – 26th Jan 2027 10:30-11:00

Signposting.

GC2030 Water Portal

<https://www.randa.org/en/sustainable-golf/water>



RESOURCE KNOWH₂OW

The Water Security Index Review Webinar.

Thank you.

