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GOLF COURSE PLAY AREAS STUDY

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Using a method developed by the United States Golf Association (USGA)

WHAT IS SNWA?



SNWA is the regional water wholesaler for the major municipal areas in Southern Nevada and is responsible for assuring adequate resources for these communities. Conservation is one of the major strategies employed to this end in addition to resource acquisition.

HOW DO WE USE OUR WATER?



- 90% dependent on the Colorado River for our water supply (through Lake Mead)
- There are over 40 courses in the Las Vegas Valley currently using 6 1/2 % of our metered water resources.
- Most use recycled/reclaimed water.
- Virtually all their use is though consumptive.

CONSUMPTIVE USE AND GOLF



Most of our courses do use reclaimed water, BUT

Given our return-flow credit dynamic, while we are getting another use out of the water this is still a significant impact to our water resources.

In many ways it is some of our most expensive water since treated twice

Flushing activity for the leaching fraction is a further draw.

THE DROUGHT HITS INNER LAS VEGAS BAY LOOKING NORTHWEST



March 7, 2000, elevation 1213 Feet



April 11, 2002, elevation 1170 Feet

GOLF COURSE WATER BUDGETS

- In 2004 all golf courses that used water from the municipal supply were subjected to an annual budget of 6.5 acre-feet per irrigated acre limit which was then later adjusted to 6.3 in 2005. The intent was to send a signal to reduce use 20%.
- If a course exceeded this budget then they were subject to a financial penalty of up to 9x their highest rate paid for water.
- Irrigated acreage included all irrigated and water surface areas.
 Provided for advantage if course opted to convert non-functional areas.



2009 ASSESSMENT – EXCLUDES CLOSED COURSES



Las Vegas Courses in 2013 (Clean set that excludes course closures, and those exclusively served by non-purveyed water.)



CONVERSION AREAS

Obviously Grass is necessary as a play surface, but there are often lots of areas that have grass but aren't necessary for the game:

Parking Lots Frontage Areas Clubhouses and Other Facilities



CONVERSIONS





Out of Bounds

Near Surrounding Residences

PRE / POST COMPARISON





Before





Photo Taken: Spring 2007



WE HAVE GOT THE LOW-HANGING FRUIT. NOW WHAT?



GOLF COURSE PLAY AREAS - WHERE DO PLAYERS GO ON A GOLF COURSE?

- What if we can visualize where the players actually go on courses?
- This can tell us where ideal prospective future areas for conversion are.
- We can examine past conversions and see if the selections were good fits for the players.
- While these are the primary areas of interest for SNWA, other findings can be made with the methodology*, including:
 - Pace of play per hole and even per shot/ (and how might that relate to conversions)
 - Maintenance efficiency for a given area.
 - Mowing pattern efficiency.
 - > Any number of other things you can dream up.

*Methodology developed by Jim Moore, Dir., Green Sec. Education for the USGA.

METHODOLOGY





METHOD

- SNWA staff distributes small GPS receiver/storage modules ("dongles") to golfers to track their movements.
- Units are retrieved at the end of play.
- Data is downloaded and analyzed.
- Picture is developed of where golfers go on the course.
- Possibility of future work with respect to maintenance of areas.















MAINTENANCE EFFICIENCY EX.

By placing gps loggers on maintenance equipment USGA identified:

- Interaction between golfers and maintenance staff
 - e.g. help identify when to "give up" on a task and reallocate the staff to another task
 - More efficient mowing patterns
 - ▶ e.g. fairway mowing patterns
- Advantages of more efficient equipment
 - e.g. triplex versus hand mowing of greens





Scenario 2					
Annual costs	R1	R2	R3	R4	R5
Acres	20	15	15	30	0
Mowings	30	24	6	2	0
Ac/ft of water/ac	2	0	0	0	0
Total ac/ft of water	40	0	0	0	0
Fertilizatons	2	1	0	0	1
Pest. Apps	3	1	1	1	1
Fuel	1,708.50	1,025.10	256.28	170.85	
Labor	2,250.00	1,350.00	337.50	225.00	-
Water	50,000.00	-	0 0 0 0 0 0 0 0 0 ₹ 0 0 0 0 0	-	-
Energy	10,000.00	-		-	-
Fertilizer	8,000.00	3,000.00	-	-	-
Pesticides	6,000.00	1,500.00	1,500.00	3,000.00	-
Total/yr	77,958.50	6,875.10	2,093.78	3,395.85	-
Total/acre/yr	3,897.93	458.34	139.59	113.20	#DIV/0!

Course-wide totals	Scenario 1	Scenario 2	ifference
Fuel Cost	5,979.7	3,160.73	2,819.03
Fuel Gallons	1,407.0	743.70	663.30
Labor Cost	7,875.0	4,162.50	3,712.50
Labor Hours	525.0	277.50	247.50
Water Cost	75,000.0	50,000.00	25,000.00
Water Ac/ft	60.0	40.00	20.00
Energy Cost	15,000.0	10,000.00	5,000.00
Fertilizer Cost	22,000.0	11,000.00	11,000.00
Pesticides Cost	14,000.0	12,000.00	2,000.00
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Total Cost	139,854.7	90,323.23	49,531.53
Water use (ac/ft)	60.0	40.00	20.00

- R1 Fine textured turfgrass, mowed weekly at 1.5 inches or less, green throughout growing season, find the ball quickly, no exposed soil, no more than 1/2 shot penalty
- R2 Fine to coarse textured turfgrass, mowed four times monthly at 3.0 inches or less, dormant (brown) durin drought stress, find the ball quickly, no exposed soil, no more than 1 shot penalty
- R3 Mixture of coarse textured grass plants, mowed monthly at 12 inches or less, wide variance in color during the year, finding the ball more difficult, exposed soil, minimum of 1 shot penalty
- R4 Mixture of native grasses, wildflowers, and woody plants, mowed twice annually at 18 inches or less, wide variance in color during the year, finding the ball very difficult, Minimum 1 shot penalty

Summary

Golf courses in Las Vegas have removed over 36 million square feet of grass since 1998 through SNWA's Water Smart Landscapes rebate program

The need to further conserve water through turf removal remains, but altering a course without impeding the rate and/or quality of play is a challenge

Using technology in creative and collaborative ways for water resource conservation is critical for Southern Nevada



THE END

Questions?