


Waterlog



Newsletter of the Minnesota Water Garden Society
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Nymphaea 'Detective Erika' - 2016 winner of the IWGS's new waterlily competition. Plaque identifies the category and entry number in the anonymous competition.



Nymphaea 'Reine du bul' - first place, hardy



Nymphaea 'Virginia McLane' - second best new waterlily and first among the tropical entries.



Nymphaea 'Galaxy' - second place, tropical



Nymphaea 'Madinina' - second place, ISG



Nymphaea 'Demoiselle' - second place, hardy

IWGS Announces Best New Waterlilies of 2016

By Soni Forsman
Images from www.iwgs.org

Hybridizers from four countries had winning entries in the annual New Waterlily Competition sponsored by the International Waterlily and Water Garden Society (IWGS). A total of 15 waterlilies from four countries competed in three categories in the 2016 competition. The waterlilies were

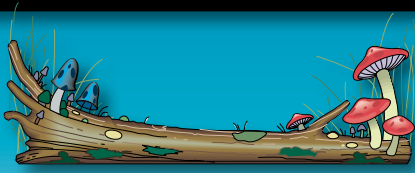
grown out at Longwood Gardens in Pennsylvania under the direction of Tim Jennings, senior gardener.

An entry from China, '*Nymphaea 'Detective Erika'*', was named best new waterlily of 2016 and the best new intersubgeneric (ISG) waterlily. Hybridizer is Zijun-Li. Taking second place in the ISG category is *N.*

'Madinina' by Florian Henaux, France.

An ISG waterlily is a cross between a hardy variety and a tropical dayblooming one. A white flowering hardy is the pod parent, receiving pollen from a blue or purple tropical. Hybridizers are striving for a winter-hardy waterlily with that elusive true-blue colored flower. They are getting

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~ Waterlog ~

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Waterlog Submissions

Contributions to the Waterlog are always welcome and strongly encouraged. Please submit any proposals to Content Editor Jan Schreier at mwgs@comcast.net or call 612 865 0440

Deadline for next issue is January 17th 2016.

The Minnesota Water Garden Society is a nonprofit organization. Our mission: to increase the enjoyment and enthusiasm for water gardening through promotion, education and shared experiences.

Reeds and Rushes

a letter from the editor

By Jan Schreier

Well, we all knew it couldn't last. Winter had to arrive in Minnesota at some point. Too bad we were so spoiled by our mild fall that when the cold and snow finally arrived, it was quite a shock to the senses. Good thing I don't make a living working outside in the winter. And in our household, our dog, Denali, is pleased as punch about both snow and cold. I know this because his first activity of the day is making snow angels, and he begs to go out and just sit on the deck in these sub-zero temperatures. Luckily God made him a lovely winter coat, and gave me the ability to go out and buy one, so we can enjoy the snow together. This fall, as I was so late in shutting down both pond and all my container gardens, I had two surprises from nature. The first you can read about elsewhere in this issue are all the frogs I found in the skimmer. Where were they hiding all summer? The second was the discovery of several super-tiny goldfish in one of my containers. They must have come in as eggs on one of my plants, and they were so small, I couldn't put them in the big pond, because (as I had learned several years ago from experience) the big fish would have had a nice fall eating frenzy fattening up on the little babies in a piranha-like attack. So I built a little make-shift tank for them using Tupperware, an aerator and a small mesh bag of

activated charcoal. I floated some azolla on top, but as I am discovering, between the fish eating it, and not enough sun, I don't think the floating plants will make it much past January. I am also discovering that there is a direct correlation between actually feeding fish, and having them grow. Clearly, since I did not know they were living in my container, I did not feed them. Inside, I am feeding them flake food, and already they are double their size since I brought them inside a month ago. I do have an old aquarium that I last used to house praying mantids, which I did not feel like cleaning out, so the Tupperware will have to do. I have a small syphon and bucket, and I do 50% water exchanges every week, which works fine, now that I figured out how not to suck fish into the syphon as I'm cleaning it, and the fish have gotten bigger to avoid getting sucked in the first place. The first time I used the syphon, four of my fish got sucked into my bucket, and I had to go find a net to fish them out and put them back. I am now prepared with a WHITE bucket, syphon, net and new water aging and acclimating to the tank temperature for the next water exchange, all together in arm's reach. So this year, I have a small piece of my water garden indoors to enjoy. A few tropical plants, and my dozen baby goldfish. That will keep me satisfied for the winter. And to satisfy the rest of our members, enjoy this winter

President's Pad

By Gary DeGrande

Winter has arrived with a bang this year. What a difference from last year at this time! I just reread my President's Pad from last December which highlighted the unusually warm weather, with my ponds not even frozen over yet. Not so this year. The sounds and sights of waterfalls will have to wait til springtime. On a brighter note, I was able to easily catch all 15 of my large Koi and transfer them inside without any loss or damage to them.....or me. Maybe I am finally learning how to do it right. That cold snap we had in mid November brought the water temperature down to where the Koi were sluggish enough to easily net. I had already conditioned my indoor aquarium filtration systems for several weeks by cleaning and restarting them, seeding them with some pond water. To minimize any temperature shock, I removed most of the water in the aquariums and replaced it with pond water just prior to fish transfer. I'm fortunate in that the placement of the indoor aquariums is close enough to the

backyard ponds that I can just pump pond water directly into the aquariums (although a leaky hose this year made for some challenging clean-up work). It has now been three weeks and the Koi are all doing well. Let's hope I can keep them that way til spring.

I do miss my daily pond and garden time and find myself going through an "attitude" adjustment to winter for a while. I enjoy my ponds and gardens so much that it takes a major effort to pull me away from them from spring til fall. In a way, it's a nice change to have free time to pursue other interests.

I am looking forward to kicking off 2017 at our January 8th meeting with a presentation by MWGS member Mark Schreier. Mark is an excellent speaker and experienced photographer who will give us a presentation on photography basics, how to get the best photo of that pond or waterfall and comparing point and shoot cameras with expensive DSLR cameras, as well as smartphones and tablets. I know I have lots to learn. Hope to see you there. ✨

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Frogs in the DeGrande pond during warmer weather.

REEDS *continued from page 2*

issue of the Waterlog with a few winter tips and stories, and beautiful photos of the latest Water Lily varieties to pine over. ✨



Winter home for my surprise growing baby goldfish.

Welcome

On Membership Pond

By Geri Claytor

MEMBERSHIP INFORMATION UPDATE:

As of November 9, 2016 we had a total of 354 members with 204 paid household memberships; for the period of November 9, 2016 through December 10, 2016 we gained 0 members with 0 households because of new memberships and renewals and

we lost 2 members with 1 household because of non-renewal/non-payment. As December 10, 2016 we have 352 members with 203 paid household memberships.

Please check out the emails we send you with the upcoming events or information. Also I send out Membership reminders via email. ✂

Treasurer's Report

BREMER SAVINGS ACCOUNT

Balance brought forward.....\$29,1151.43
Interest Savings\$7.80
Balance as of 12/11/2016\$29,159.23

BREMER CHECKING ACCOUNT

Bank Charges.....\$5.50
Fish Food – Maintenance\$758.00
Logo Merchandise–Paid Out.....\$53.00
Meeting – Room Rental\$25.00
Newsletter\$693.00
State Fair Pond Maintenance.....\$70.00
Sunshine Fund\$48.21

TOTAL EXPENSES.....\$1,653.11

Interest Checking.....\$0.09
Membership – On-line.....\$101.04

TOTAL INCOME (CHECKING).....\$101.13

Checking Account Balance9,429.43 ✂

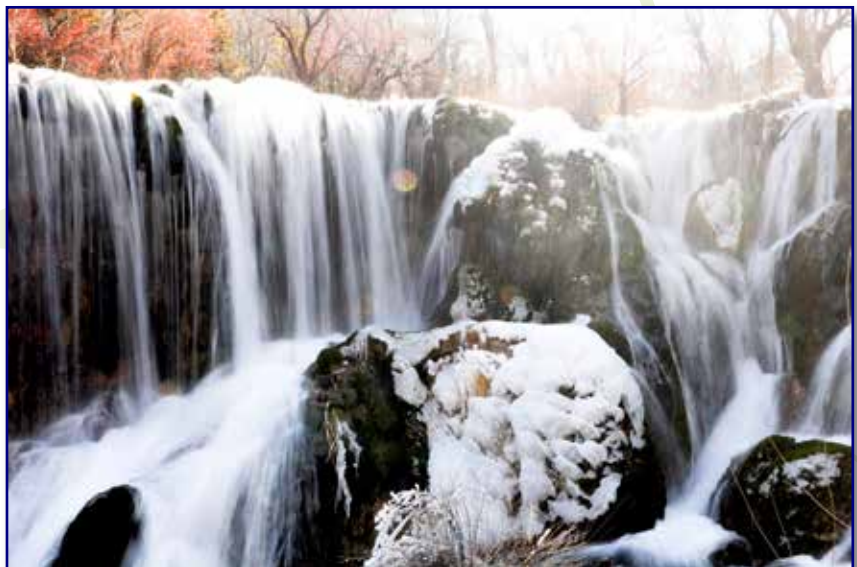


Please send Memberships/Renewals along with your check for \$35.00 to:

MWGS MEMBERSHIP

c/o Geri Claytor
15496 Dresden Trail
Apple Valley MN 55124

Or payment can now be made on our MWGS Website under Join Today Tab, click on Membership, at the bottom of the page click on Pay Online.

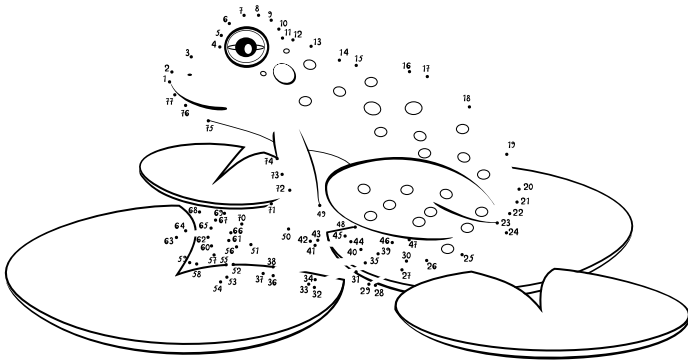


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Secret Number: 31

Thirty one is the answer to the question: How many frogs did Jan & Mark find this fall in their skimmer? OK, this does not even count the biofalls, where Jan found 25 last year. It does give credence to the adage "If you build it, they will come." But I want to know, where were they all summer? At any one time, the most we counted was 6. So where were they

hiding? Very well, apparently. So we made an impromptu visit down the trail to our wetlands to "release" them back into the wild and into a more natural environment where they will have a better chance of survival. I hope they enjoyed their wild ride and bucket launch and are surviving well under the wetland ice. 🐸



What does Mark hold in these two buckets?



Mark releases bucket number one of frogs to the wetlands.



Jan takes her turn at frog release too, with a steady flow.



Member Spotlight: Michael Chance Bollinger

Why did you join the MWGS? I joined the water garden society last spring. I joined because I enjoy the pond tours and talking with people that are as passionate about water features as I am.

Tell us about your home, family and pets: My wife Jen, and I have been married for 2 ½ years. We have a pond loving daughter named Kendall who is 3 ½. We also have a baby girl due any day. Bo, is our 9 year old Pomeranian.

What hobbies or interests make your day? I play a lot of slow pitch softball. This past season I played with Budweiser and we were ranked 6th in Minnesota. That usually takes up about 14 weekends a summer.

What was the most interesting job you ever had? Since I was 18 I worked for myself so I can't really say there was an interesting job.

What do you do now? I own a landscape company named Urban Landworks and we have been in business since 2003. We are a Master Certified Aquascape Contractor. I also own a retail store called The Pond Company. We sell all different brands of pond supplies and we recently opened an online store with HUGE discounts. Both are located in Bloomington, MN

Where would you love to go on vacation again? Why? St. Thomas Virgin Islands is my go-to spot. I love sitting on the beach and watching the cruise ships

come in. If you ever get a chance to go there, you can take a ferry boat across the bay from the Marriott Hotel to town. I also like going there because they have great prices on diamonds. I bought my wife's engagement ring there.

What holiday do you enjoy the most? Why? Thanksgiving because all of our families come together and have a great day. Plus, Jen is a great cook.

If you won the lottery tomorrow what would you do with that? I would make sure my kids had a savings account for college and I would put enough money away for them to live a comfortable life. As for me I would buy a bigger house with some land and build a swimming pond and travel the world once my kids were old enough for me to get away.

What childhood memory makes you smile? A childhood memory that makes me smile is playing in the Minnesota state baseball tournament, in 2000 we played in the state tournament and placed 5th. That 5th place game, we played a team called Cretin Derham Hall with a famous guy named Joe Mauer on the team. We ended up beating them 2-0, I received a great picture as I am on 1st base and Joe is playing first base. I can't wait to have him sign it one day.

What do you wish you knew before you built your first pond? I wish I would have used bigger boulders. Bigger boulders make ponds look so natural.

What are you most proud of in your yard or garden? I am proud of all of my yard. I designed it all myself and did a lot of the work myself.

What was the most gratifying

moment or compliment that you had from someone seeing your pond? I can't tell any fun stories about my own pond but I can about several ponds we have built. I don't know what it is about when you build someone a water feature but it changes their life. After we are done building water features we have had so many people get emotional. I am a true believer that everyone needs a pond they just don't know it yet.

What would you rather do than go to work? Since I have worked for myself since I was 18, all I know is work. But if I could pick one thing to do rather than work it would be golf. It is a new hobby for me and I really enjoy not just golfing but being out in nature.

What is your favorite saying or inspirational quote? Dealing with a lot of employees on a daily basis, my favorite line is "Don't make your problems my problem". It's just a fun line I have with the guys and gals at the companies.

Tell us something about yourself that not too many people know. Most people don't know my story on how I got into the landscape field. When I went to enroll in college at Dakota County Tech., the GM mechanics program was full, so I enrolled in the landscape horticulture program. 15 years later here I am living, loving the pond life.

I also have to let your members know we have all products online at a great discount. If you buy at thepondco.com you can still do an in-store pick up for the online price. We just opened the online store. ✨

lots of new waterlilies blooming in many colors including all shades of purple and bluish-purple. Many are reported to be winter hardy.

Capturing the title of second best new waterlily and first place in the tropical group is *N. 'Virginia McLane'* from Florida Aquatic Nurseries, USA. An entry from Thailand, *N. 'Galaxy'* by Ao Weerreda placed second in the tropical category.

Two hardy entries from Henaux captured first and second place in that division. They are *N. 'Reine du bal,'* and *N. 'Demoiselle'* respectively.

An international panel of 12 judges from 9 countries selected the winners. Judging was done online from a series of photos taken of each entry. ✨



Pond Building 101 Resources

Over the years, we receive many questions about sizing pumps and filters for the outdoor pond. I thought I would share with you a few helpful hints from our universal seminar "Pond Building 101". Old hat for our experienced members, refresher for some, and helpful to new pond owners just getting started. Meanwhile, if you have questions on construction, filtration, plants or anything else about water gardening you have the following resources:

- Write an email to mwgs@comcast.net. Your question will be answered in a few days, or will be directed to another MWGS member who may know the answer.
- Ask during a meeting. This is the best option, because at any one meeting, you may have 20-50 people who may know the answer, or have tried something similar. This is a great way to get a lot of ideas in a short time.
- Send your question in to the newsletter. If you have that question, others may too, and seeing a response in the newsletter is helpful to everyone.
- Seek out a Pond Pal. Pond Pals are experienced members willing to mentor new members. They can come over to your house, or just chat with you over the phone to answer questions or offer advice. Don't have a Pond Pal? Check the inside cover of the Waterlog, and the Pond Pal coordinator will find one for you.

Check back issues of the Waterlog. Did you know, that for a small fee, you can get on a CD, every copy of the Waterlog ever written since 1997? An index is included so you can search by topic or author. See Geri Claytor for the CD's.

How cool is all that? Now there are no excuses for having an unanswered question! And to give everyone a little mental math stimulation, I am including two related articles about sizing the pump and calculating the volume of water in your pond. Both good activities to do when you are hunkered under the down comforter waiting for spring to arrive.

Sizing Pumps

There are three major factors in sizing a pump: Filtration requirements, Losses from head height and pipe friction, and Aesthetics. Choose the largest pump needed after considering all three factors. At the end of this article, we will also look at pump efficiency and how to vary the outflow.

FILTRATION REQUIREMENTS

There are many factors that determine your filtration requirements. How many fish do you have? How big are they? (Remember fish grow and reproduce over time). Is your pond in sun or shade? How many plants do you have? What comes into your pond from the external environment? (Falling leaves, pooping ducks, Gutter downspouts, rainwater run-off). For purposes of sizing a pump though, we will use a simple formula based upon High, Medium or Low requirements for filtration. And by doing that, we can reduce terms to those that can be calculated for pumps by referring to a term called "Water Turns per Hour". What that means is, how long it takes your pump to circulate 100% of the volume of water in your pond. For example, in a 1,000 gallon pond, if you had a 500 gallon per hour pump, you would get ½ turn in one hour, or the whole volume of the pond would turn in 2 hours. For the same size pond, if you had a 2,000 gallon per hour pump, you would get 2 turns every hour, or the whole volume of the pond would turn in ½ hour. So here are your basic rules of thumb. For LOW filtration needs, turn your water once every 4 hours minimum. Low filtration requirements mean a pond with few fish, mostly shade, with a lot of pond

plants, and no external run-off into the pond. MEDIUM filtration requirements need to turn the water once every hour. Medium filtration requirements would mean about 1" of fish for every 100 gallons of water, 2/3 of the pond surface area covered with plants, and 4-6 hours or less of sunlight, having a skimmer or other system to remove falling leaves and debris. HIGH filtration requirements would want to turn the water 2-4 times per hour, plus include additional filtration like a larger bog filter, UV filter or external bead/bio filter.

LOSSES

Pumps are rated for ideal circumstances, meaning that they don't have to work to pump water uphill or through long stretches of narrow pipe. When you look to calculate the number of turn per hour, you have to take into consideration the ACTUAL volume coming out of the pump in your particular pond, and that can vary dramatically for the same pump in different situations. The biggest loss is from what is called "head height" which is effort that the pump uses to pump water uphill. Head height is measured from the top of the main pond water to the top of the highest stream. Each pump will have a graph or chart that will show the volume of water at different heights. Most mag driven pumps can't handle large head heights and lose efficiency quickly. Centrifugal pumps do better with tall waterfalls and streams. Compare this chart for centrifugal pump model number 302 (the middle line) shows that the output of the pump at 50 foot head height is about 54 gallons per minute, while at 70 foot head height it is only 30 gallons per minute.

Now compare this chart for a mag drive pump: At 10 feet of head height, the output of pump B is 7 gallons per minute, and at 15 feet of height, it drops to about 3.5 gallons per minute. But more importantly to observe, is that if your head height is much more than 16 feet, you won't get anything out of that pump.

Mag drive pumps are great for low flow and low head height. They are super reliable and very efficient for fountains and small ponds. If you have

POND continued on page 9

FRICTION LOSS CHART Friction Loss (in feet) per 100 Feet of Run

Flow Rate @ Static Head		Schedule 40 PVC Pipe															
		3/4 Inch		1 Inch		1 1/4 Inch		1 1/2 Inch		2 Inch		3 Inch		4 Inch		6 Inch	
GPM	GPH	Rigid Pipe	Flex Pipe	Rigid Pipe	Flex Pipe	Rigid Pipe	Flex Pipe	Rigid Pipe	Flex Pipe	Rigid Pipe	Flex Pipe	Rigid Pipe	Flex Pipe	Rigid Pipe	Flex Pipe	Rigid Pipe	Flex Pipe
1	60	0.51	0.83														
2	120	1.02	1.64	0.55	0.71	0.14	0.24	0.07	0.11								
5	300	5.73	8.89	1.72	2.19	0.44	0.74	0.22	0.30	0.07	0.09						
7	420	10.52	17.04	3.17	4.12	0.81	1.37	0.38	0.58	0.11	0.14						
10	600	20.04	32.10	6.02	7.90	1.55	2.66	0.72	1.09	0.21	0.28	0.03	0.04				
15	900	42.46	67.88	12.77	16.72	3.28	5.63	1.53	2.31	0.45	0.58	0.07	0.09				
20	1,200	72.34	115.45	21.75	28.40	5.59	9.61	2.61	3.95	0.76	0.97	0.11	0.13				
25	1,500			32.88	42.95	8.45	14.50	3.95	5.98	1.15	1.48	0.17	0.21				
30	1,800			46.08	60.26	11.85	20.32	5.53	8.36	1.62	2.06	0.23	0.28	0.06	0.07		
35	2,100					15.76	27.02	7.36	11.13	2.15	2.75	0.31	0.37	0.08	0.09		
40	2,400					20.18	34.64	9.43	14.25	2.75	3.51	0.40	0.48	0.11	0.12		
45	2,700					25.10	42.95	11.73	17.71	3.43	4.36	0.50	0.60	0.13	0.15		
50	3,000					30.51	52.41	14.25	21.52	4.16	5.31	0.60	0.74	0.16	0.18	0.02	0.02
60	3,600							19.98	30.25	5.84	7.43	0.85	1.04	0.22	0.25	0.03	0.03
70	4,200									7.76	9.88	1.13	1.36	0.30	0.34	0.04	0.05
75	4,500									8.82	11.22	1.28	1.56	0.34	0.38	0.05	0.06
80	4,800									9.94	12.65	1.44	1.76	0.38	0.43	0.06	0.07
90	5,400									12.37	15.72	1.80	2.19	0.47	0.53	0.06	0.07
100	6,000									15.03	19.12	2.18	2.66	0.58	0.65	0.08	0.09
125	7,500											3.31	4.02	0.88	0.99	0.12	0.14
150	9,000											4.63	5.61	1.22	1.39	0.16	0.19
175	10,500											6.16	7.48	1.63	1.85	0.22	0.26
200	12,000											7.88	9.56	2.08	2.36	0.28	0.33
250	15,000											11.93	14.45	3.15	3.56	0.43	0.50
300	18,000													4.41	4.99	0.60	0.69
350	21,000													5.87	6.63	0.79	0.92
400	24,000													7.52	8.50	1.01	1.18
450	27,000															1.25	1.48
500	30,000															1.53	1.78

This chart is based on the Hazen-Williams Formula with C=150 for Rigid Pipe, C=140 for Flex Pipe for actual pipe ID.
Source: Spears & Pacific Eco

Example of how to use this chart

If you have 3000gph flowing thru 50' of 2" flex pipe with 2 90 degree elbows and 1 swing check valve, your friction loss would be:
 $((50' + 8.6 + 8.6 + 19.1) \times 100) \times 5.31 = (863 \times 5.31) = 4.58'$
 Using 1.5" rigid pipe, your friction loss would be = 12.3'

Notes:

- Friction loss can vary by 20% due to temperature.
- Bends can increase friction loss by 50%.
- To convert from feet of head to PSI, divide by 2.309
- To convert from U.S. gallons per minute to cubic feet per minute, multiply by 0.1337

Friction Loss in Equivalent Feet of Straight Pipe								
PVC Fittings	Pipe ID ->	3/4"	1"	1 1/4"	1 1/2"	2"	3"	4"
Std Elbow, 90 degree		4.5	5.3	6.7	7.5	8.6	11.1	13.1
Std Elbow, 45 degree		0.9	1.4	1.8	2.2	2.8	4.1	5.6
Coupling		0.8	1.0	1.25	1.5	2.0	3.0	4.0
Male / Female Adapter		1.5	2.0	2.75	3.5	4.5	6.5	9.0
Tee (Straight Thru)		2.5	3.3	4.7	5.7	7.8	12.1	17.1
Tee (Thru Branch)		5.4	6.7	8.8	10.0	12.1	17.1	21.2
Swing Check Valve		8.9	11.2	13.1	15.2	19.1	27.1	38.2
Gate Valve (Full Open)		0.7	0.9	1.2	1.3	1.6	2.0	2.7

a larger pond or waterfall, you will want to invest in a centrifugal pump or even more efficient external pump for very large applications.

In addition to head height, there are losses due to the diameter of the pipe, and what kind and how many elbows and turns you have. The loss through friction of a pipe, is negligible in low flow pumps, but becomes dramatic as the flow increases. For pumps greater than 3,000 gph, you would want to take that into consideration and provide pipes at a minimum of 2" in diameter, and very large pumps may require 3 or 4" diameter pipes to limit friction loss. There are plumbing tables to calculate friction loss and can be found on a number of websites such as <http://www.pondboy.com/images/friction-loss-chart.jpg> This chart shows the effect of pipe diameter and fittings for various pump flows. Using the example given in the chart, for a 3,000 gph pump the difference between using 1.5 inch pipe vs. 2 inch pipe with a few fittings adds

the equivalent of 12.3 feet vs. 4.5 feet of equivalent head height.

AESTHETICS

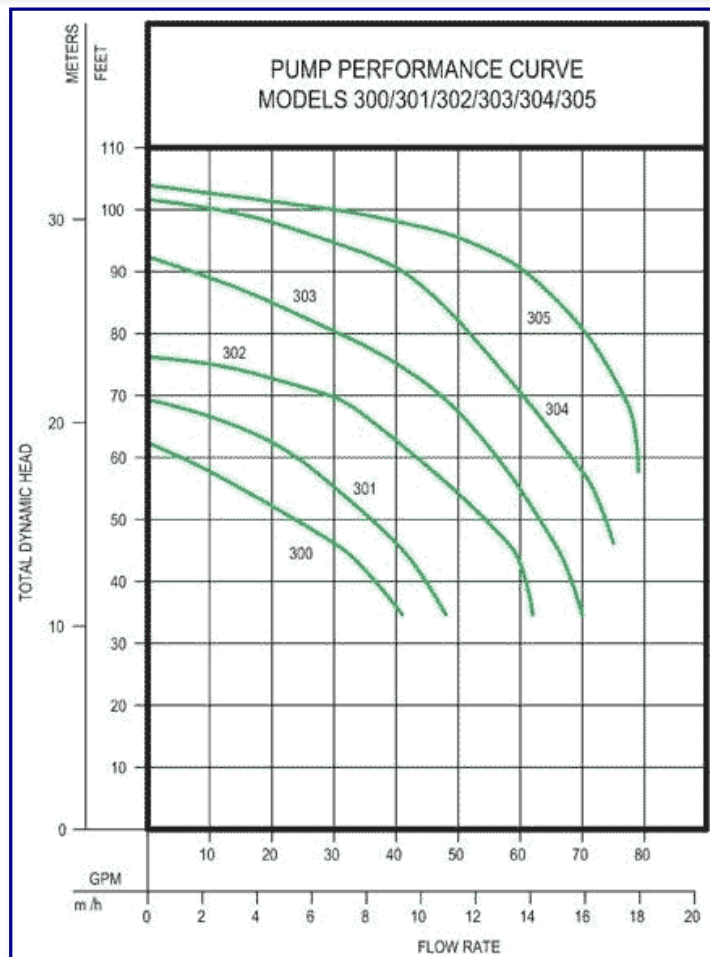
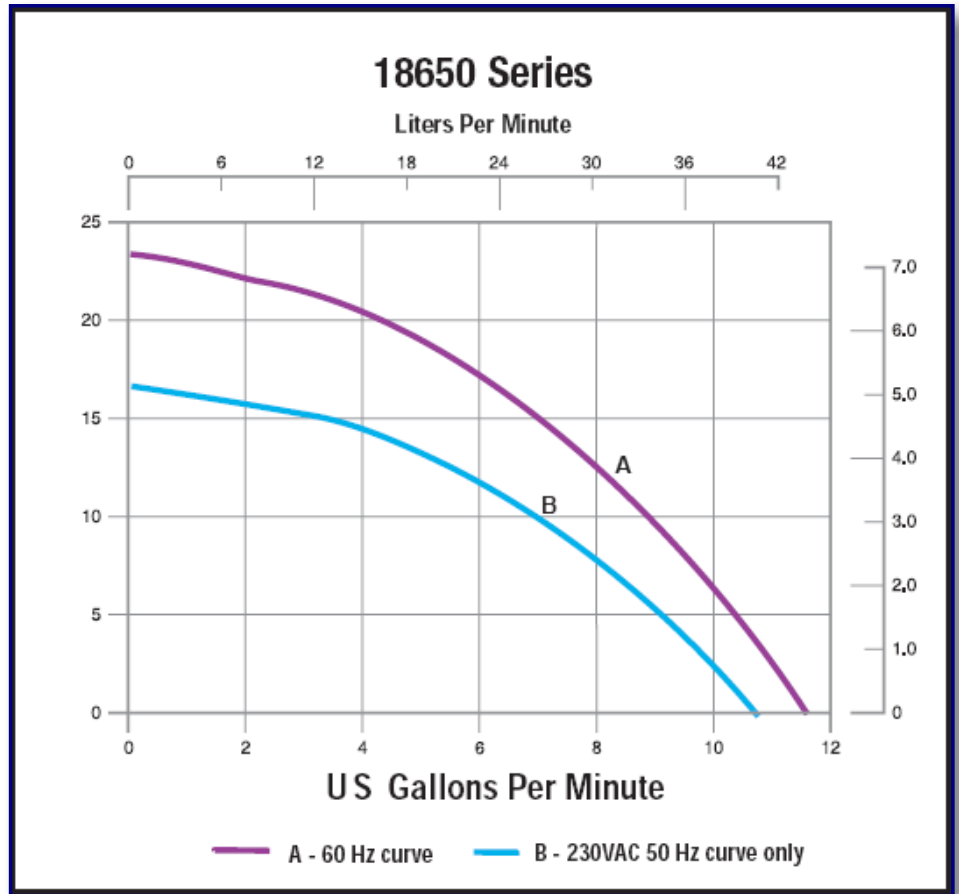
Sometimes you opt for a larger pump due to aesthetics. You have a wide waterfall, and you want a smooth sheet of water flowing over it. The rule of thumb here is 100-250 gallons per hour per inch of waterfall width. So if you have a 12 inch wide waterfall and it is very flat and smooth, and you want the water to flow over just enough to make a continuous sheet, use a 1200 gph pump (12 x 100gph). If you have a 20 inch wide waterfall, with natural stone, and you want rushing water to completely cover it, use a 5000 gph pump (20 x 250gph).

BRINGING IT ALL TOGETHER

Calculate your net pump size by first figuring out which is larger: Filtration or Aesthetics. Using that number for your net flow, now figure out head height including friction loss if necessary. Now find the pump with the curve that fits your calculation. Most centrifugal

pumps are most efficient in the middle of their curve, so pick a pump where the flow matches your required rate of flow at the specified head height and make sure it has the capability for higher head height to make sure it is operating in a more efficient area of the curve. They do now make pumps with variable outflow which can solve some of the problem, but you can always limit the outflow of any pump by placing a valve on the outtake of the pump. (NEVER limit the intake of the pump, as that is the surest way to burn out a motor.) But, limiting the output of the pump is a nice way of controlling the flow, and by restricting the output, you will also use less energy than at full flow.

Lastly, when comparing different pumps, buy the most efficient pump you can afford. You can compare how many amps (current) or watts (power) the pump will consume at different flows. You want to purchase the lowest power consumption for the flow you need. In general, the more efficient your pump, the better quality it is and it will last much longer. Another idea, if your calculations for aesthetics is much higher than you need for filtration, consider installing two pumps. Use one pump 24/7 for your filtration needs, and then when you are outside enjoying your pond, or when you have guests, turn on the second pump for that aesthetic effect. You will save money running the larger volume only when you need it, and you will have a built-in spare if anything ever happens to your full time pump.



Calculating the Volume of Your Pond

Do you know the size of your pond based upon the gallons of water it holds? There are many reasons why it is good to know the volume of your pond: Sizing the pump, adding bacteria or other chemicals to your pond, figuring out how much filtration you need, or how many fish you can keep. You can figure this out in one of three ways: Calculate it based upon the size and shape of your pond, read your water meter when you fill the pond from scratch, or time the water to fill your pond (if you have constant pressure throughout the time it takes to fill your pond.). Since two of the methods require you to completely drain your pond and fill it again, sometimes it is good to calculate it mathematically, and then use one of the fill methods during spring cleaning to check your math and see how close they come to each other.

CALCULATING VOLUME MATHEMATICALLY

To calculate based upon the size and shape, there are three useful formulas. One is that it takes 7.5 gallons of water to fill one cubic foot. Next, is to calculate the area of the pond. For a rectangular pond, it is Length x Width x Depth. So a rectangular pond that is 3 feet deep, 10 feet long and 5 feet wide, would have an area of 150 cubic feet or 1,125 gallons. But most of our ponds are not rectangular. For a cylinder, the area would be π (The symbol Pi equals 3.14) x Radius (squared) x Height. So a cylinder that is 4 feet high and 6 feet wide would have a volume of 3.14 x

$3^2 \times 4 = 113$ cubic feet or 848 gallons. You can successfully fudge an oval pond by averaging the length and width. So for an oval pond 4 feet wide and 10 feet long, use a diameter of 7 feet, or a radius of 3.5 feet. You can add up shapes as you go, say an oval on the top shelf and a cylinder on the bottom with a rectangle for your biofalls. Remember, that these are just estimates and it is OK if you are off a little.

READING THE METER WHEN FILLING THE POND

If there is nobody using water in your house when you fill the pond (that means running the dishwasher, taking a shower, flushing toilets, watering the lawn...), you can take before and after readings of your water meter. Most modern digital meters read in 1,000's of cubic feet of water. So a meter reading difference from start to finish of 1.2, would mean you have 1,200 cubic feet of water or 9,000 gallons of water. But the old analog meters usually have a gallons readout which requires no additional calculation.

ESTIMATING BASED ON TIME TO FILL

Another way to calculate volume is based on the time to fill method. Turn your water on when your pond is empty (again, with nothing else consuming water in your house), time how long it takes to completely fill your pond. Once you figure that out, time what it takes to fill a known volume. For instance, a 50 gallon stock tank, or a 5 gallon bucket. Then divide the total pond fill time by the known bucket fill time and multiply by the size of the known volume. If it takes 30 seconds to fill a 5 gallon bucket, and two hours to fill your pond. Then your pond volume would be $120 \text{ min} \times 60 \text{ sec/min} \div 30 \text{ sec} \times 5 \text{ gallons} = 1200 \text{ gallons}$. ✂



Did You Know?

By Carolyn Weise

Reprinted from the Microbelift eNewsletter

- Koi do not hibernate; they go into torpor where their metabolism slows and they use less energy at cold temperatures below 45F.
- Koi and pond fish are poikilothermic, or cold-blooded; they do not manufacture their own heat. Huddling together will not "warm them".
- Adding salt in winter can make your pond water's freezing point drop to below 30F which will kill your fish. Temperatures below 34F will allow ice crystals to form on the gills. ✂

Questions Asked & Answered

If you have a question, or need advice, feel free to ask other MWGS members, or find a Pond Pal (see inside cover for the Pond Pal coordinator.) If it is of general interest, it may also get printed in the Waterlog for others to learn too. Perhaps for the next issue (or this spring, when they found out if it worked), Karla & Brad can provide us with an update on their goldfish.

Members Karla & Brad Anderson had a fish emergency and asked for advice. Here is their original request:

We'd appreciate any advice you can give us. I don't know if you recall but our fish are all goldfish. For the past 10 years we have always kept them in the pond over the winter with no issues. This year with our equipment failure and the fact that the Hedberg pond experts are off for the season we are unsure what the best course of remedy is now. After 24 pots of boiling water tonight we melted 4" of ice but unsuccessful at creating an air hole. We put our heated bird bath on top and are going to bed now. Don't think it will save the goldfish but after each pot of hot water Brad tried pounding his fist through the hole with no success. I will try to get to Hedberg before they close at 4:00 tomorrow to get a replacement heater.

Jim Kirchner responds:

If it's frozen completely, the heater isn't working or it's too small of wattage.

The easiest would be to get a new heater and carefully cut the ice out enough to insert the new one. Don't chop or hammer as the sound wave shocks can be detrimental to the fish. I'm not familiar with heaters, so I'd defer to someone who is. I copied Jan Schreier and Gary DeGrande on this as I think they might be able to advise on the brand and wattage needed.

Gary DeGrande responds:

Such dedication!! Fist pounding on a frozen pond! Seriously, I think you know that I don't keep my fish outside anymore and let my ponds freeze over. I do know, from my own experience when I used to keep goldfish outside, that if there is at least some liquid water under the ice and if it hasn't been too long that the surface has been frozen, the fish may survive. If you find that you can't install a new pump, another option is to hang a bubbler near the surface close to the heater. You may still have to go out and break through what may become a dome of ice above the bubbler in very cold weather. If you find the pond is completely or near completely frozen (I forget how deep your pond is) and/or you find some dead fish, you might want to just shut everything down for the winter (although you will want to bring in any pumps) and save yourself from the battle with winter this year. Marty will be happy to sell you some new fish in the spring!

Jan Schreier responds:

I have read, and have anecdotal evidence that the stress on fish caused by pounding on ice in an ornamental pond is an urban myth. So, I wouldn't worry too much about that part. My pond is a three leaf clover, with two of the leaves only 1 foot deep, and the third leaf about 3.5 feet deep. As you can imagine, every year, I get a few "stupid" fish who stay in the shallow end and get caught there and freeze, while all the other fish are fine. Several years, the weather has been such that my first layer of ice is glaze and I can see through the ice to the bottom of the pond. On several occasions, all the fish were seen in the shallow end, soaking up the afternoon sun. I was afraid that they would stay there all winter, so I tried to get them to move. They didn't respond to ANYTHING. Shadows, waving, pounding, nothing. I finally banged on the ice with a hammer for so hard and so long, that I got them to move. About 4 inches. You can't tell me that they were under stress during that time. They were practically comatose!

Plus, they all eventually made it to the deep end that year, and survived just fine.

For your ice, you can get any pond heater but also, pipe heat tape from big box hardware stores will work too, and may be more readily available. That will give you 1200 to 1500 watts of heat and will melt through the ice in a matter of hours. Just don't let either end (the tail end, or the area that has the temperature sensor) submerge in water. I like this so much, that I have now taped one of these to my aerator hose for winter aeration. Keeps the big aeration dome from forming, and I also don't have to worry about condensation freezing inside the aeration hose (which has happened on occasion). I only plug it in during below zero temperatures to save on electricity and life of the heat tape. Depending on your fish load and size of pond, they can take about 1-2 weeks without an air hole, and be just fine, so unless you have seen all of them floating, they may still be OK. I gave up on using a pump to agitate the water long ago and opted for the indoor/outdoor aerators for all of my pond winterizations. Several reasons: Pumps can clog with leaves and other debris, and once that happens, it is very hard to pull it out/replace or unclog. Aerators work on 25-50 watts of power, and pumps are more like 1000-5000. If your aerator goes out, it is on land, and you can easily bring it inside to replace the diaphragm (very inexpensive!), or if that isn't it, replace the aerator.

So maybe for next year, you may want to get an aerator kit which would include aerator, heavy-weight tubing (don't get clear vinyl, as that is subject to condensation freezing clogging the hose), and a diffuser. Good ones (kits) will run you \$150-\$300 which is usually less than the cost of a pump. I also protect the aerator by placing it on a basket or bricks to keep it off the ground and cover the top with a 5 gallon bucket. This prevents water from getting into the aerator due to melting or falling snow/rain.

Karla & Brad Fish Update:

I was finally able to get there after many nights of melting water and purchased a heater. That cleared it up right away and then the adventure began. As I placed the heater in and melted more ice with boiling water to get my now frozen in bird bath heater we went inside the house to warm up. About 30 minutes later we noticed strange patterns next to the hole. What on earth caused those tracks in the snow? Was something going in and out of the water hole? We saw nothing. Another hour goes by and we see more tracks. Clearly the fact that it was below zero and we had opened a water hole was of great interest to critters.

The next morning we woke up and saw the usual - bunny prints everywhere! When I got home from work this afternoon I looked into the hole and there are definitely goldfish still alive and well huddling around the heater.

So - we saved some fish and had some interesting adventures with critters during the night!

Thank you all for your advice!

Karla and Brad

Jan Schreier thinks it is an ermine running in and out of the water, which can eat fish, but hopefully, it was just playing, and is glad to know that Karla saw living fish. 🐟



We love our winter pond, especially when the water is open.



Equipment malfunction caused the pond to completely freeze over



30 minutes after placing the heater, we see strange tracks



Another hour passes. Something is LOVING the open water.

One Bad Apple

By Michelle Grabowski, UMN Extension Educator

Reprinted from University of Minnesota Extension at http://blog-yard-garden-news.extension.umn.edu/2016_01_01_archive.html



Sunken black rings of fungal growth on a stored pumpkin

If you have stored garden produce from your own garden or the farmer's market be sure to regularly inspect this produce for problems. One bad apple spoils the barrel succinctly describes how post-harvest rot organisms can start in one bad piece of fruit and grow to infect everything sharing the same storage bin. Fungi and bacteria can both cause rot of garden produce in storage. Some of these organisms are weak pathogens that infect the plant in the garden but do not cause damage until after harvest. Others, like common bread mold (*Rhizopus* sp.) and blue mold (*Penicillium* spp.) are saprophytes that can easily be found in soil or plant debris.

Post-harvest rot organisms take advantage of wounds like small cuts, bruises, or chilling injury to infect plant tissue. To avoid problems with storage rot harvest fruits and vegetables when

they are fully mature but not overripe. Take care not to bruise or damage the fruit during the harvest process and do not store produce that is already showing signs of rot or has obvious cuts or bruises.

Store each kind of produce in ideal conditions for that fruit or vegetable. Regularly inspect stored produce for signs of rot. Look for small round sunken spots, discolored areas, or soft tissue. Any produce showing these symptoms should be promptly removed. If caught early, the infected area can often be cut out and the remaining healthy tissue can be cooked and eaten. If the rot has taken over the majority of the fruit, remove the rotten fruit as well as all of the fruit touching it. Discard any rotten produce and use the neighboring produce in cooking as soon as possible as it has been exposed to the rot organism and will not likely store for long. ✂



White mold spreads through stored carrots. W. Brow Jr. Bugwood

2016 MWGS Calendar



- Jan 7, 4pm - ?, Pond Party, Pat & Wally Nelson, Maple Grove, MN
- Jan 8, 2-4pm, General Meeting, "What the F-stop?" by Mark Schreier, Ridgedale Library
- Feb 12, 2-4pm "The Latest in Pond Construction Equipment & Maintenance" by Matt Jensen and Lisa Greeney
- Mar 12, 2-4pm "Landscaping to Compliment your Water Garden" by Bill Osmundson
- Apr 9, 2-4pm "Favorite Water Plants for the Pond and How to Divide Them" by Jan Schreier
- May 12 noon-3pm and
May 13 & 14, 9am-3:30pm MN Landscape Arboretum Plant Sale
- May 12 & 13 9am – 3pm and
May 14 9am – noon Friends Plant School Sale
- May 21 11:30 – 3pm MWGS Picnic, Plant & Fish Sale, Jaycees Shelter at Roseville Central Park
- Jun 11, 2-4pm "Neighborhood Birds" by Clay Christensen
- Jul 22 Bus Tour of MWGS Tour Sites
- Jul 29 & 30 9am – 5pm MWGS Tour of Water Gardens ✨



Pond Parties

By Timm Weiss



We have one party scheduled for: Saturday Jan 7th at 4:00pm at Pat and Wally Nelson's. 6921 Magda Drive, Maple Grove, MN 55369. (Some GPS say Osseo due to the Zip code).

Pat loves to decorate and cook. You will want to be there. Please let me know soon.

Timm
763-560-8686 ✨



Minnesota Water
Garden Society



Visit our website at
[www.MWGS.org!](http://www.MWGS.org)



c/o Gary DeGrande
4100 Oakmede Lane
White Bear Township, MN 55110

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Twin Cities MN



Next Meeting:

Sunday, January 8th
2-4pm

Ridgedale Library
12601 Ridgedale Dr.
Minnetonka, MN 55305



What the F-stop? by Mark Schreier

What the F-stop is the best choice for your camera needs? Mark Schreier, original member of MWGS (or MAPE, if you go way back) and longtime photographer, will give a humorous and informative presentation on photography basics and choosing the best camera for your needs. Are you shooting photos of your dear kids in the backyard or shooting photos of deer in your kids' backyard? How do you get the best photo of your pond, waterfall and fish? Mark will describe the benefits and limitations of expensive DSLR equipment, point and shoot cameras, smartphones or tablets. Which ones are right for you? You might be surprised! ✨