



Teaching students about the environment and having them conduct hands-on stewardship projects is helping to create an informed citizenry for the future

NYSG Developing the Next Generation of Great Lakes Stewards

New York needs a well-informed citizenry, properly educated regarding Great Lakes issues. New York Sea Grant (NYSG) is dedicated to developing the next generation of Great Lakes stewards by working with students to have them conduct environmental stewardship activities, and by instructing teachers on the importance of having their students get involved with environmental activities.

NYSG Responds

In 2013, NYSG engaged 30 undergraduate students enrolled in a Great Lakes Ecology course at the University of Buffalo (UB) in Great Lakes stewardship. The students provided 10 hours of stewardship activities, including:

- coastal clean-ups,
- invasive species removal,
- native species planting, and
- pharmaceutical take-back programs.

NYSG also engaged 45 educators in learning about the importance of stewardship activities for 4,000 of their middle and high school students in NY. The students worked with nature centers, fish hatcheries and community groups.

Steward Projects Make Learning Authentic

The UB college students' activities helped to improve several acres at Tiff Nature Preserve in Buffalo through the removal of invasive species and planting of native trees to enhance the environment.

The students reported on their stewardship projects; many indicating that the activities helped to make their course learning relative and authentic. They expressed pride in their accomplishments and acknowledged the positive impact their efforts had on their local Great Lakes environment.

NYSG coastal education training has seen teachers get students out in the Great Lakes shoreline environment to clean-up beaches and waterways, take and test water samples, work on eliminating invasive species such as water chestnut, mark elm trees for Emerald Ash Borer control, and teach community members about the importance of



High school students test water they collected as part of a stewardship education activity, photo: Kim Linkinhoker

properly disposing of unwanted or unused medications.

Through these NYSG-prompted activities, the students learned about the Great Lakes and have seen how humans can negatively impact the environment, but, more importantly, by experiencing how their actions can make positive changes, they now understand they can personally play a part in protecting the environment.

This hands-on learning encourages interest in supporting future clean-up efforts, joining environmental groups, taking actions to control the spread of aquatic invasive species, and initiating other stewardship activities.

Partners: Tiff Nature Preserve, University of Buffalo, Western NY school districts, local resource managers

The Sea Grant Focus Area for this project is Healthy New York Coastal Ecosystems.

New York Sea Grant is a joint program of Cornell University, the State University of New York, and NOAA.

New York Sea Grant Extension

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This project summary was written by

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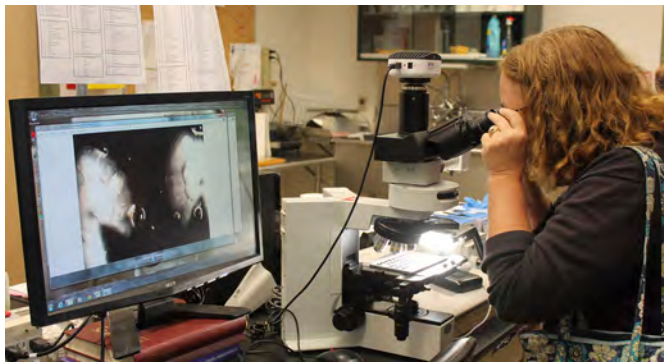


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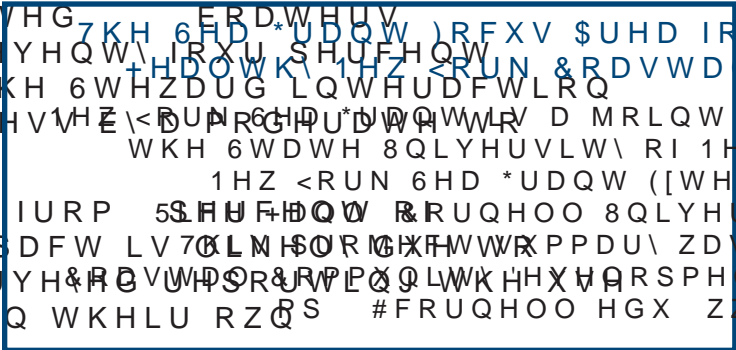
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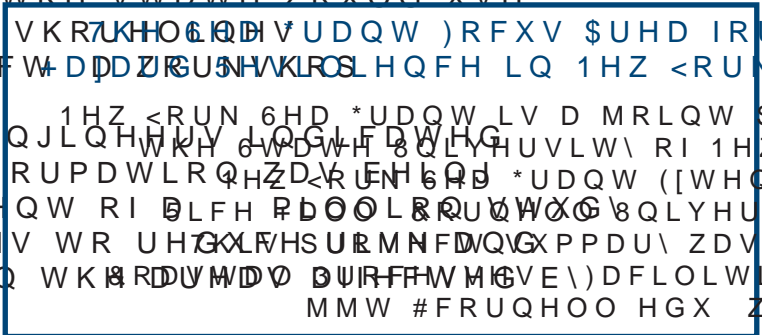
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'HSDUWPHQW RI (QYLURQPHQWDO &RQVHUFDWLRQ

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SURJUDP\ V DFWLRQ SODQ JRDOV LQFOXGH SURYLGLQJ DFFHVV
WR WKH ULYHU LQ RUGHU WR LQFUHDVH DQG VXVWDLQ UHFUHDWLRQ
DQG WRXULVP IRU XQGHUVHUHG, RPPXQLWLQJ & RUQHOO ZLOO SU
LQLWLDWHG WKH SURMHFW DW &RUQHOO DFFHVVLELOLW\ \$SUZDQ
XQLYHUVLW\ H\SHUWLHV DQG ZRULQJ & RQVHUFDWLRQ
1<6'(& UHSUHVHQWDWLYHV

3DUWQHUV
7KRURXJK DFFHVVLELOLW\ FRPSOLDQFH IRU RQVHUFDWLRQ ZLWK
FRQGXFWHG DW 1<6'(& VXSSRUWHG VLWV IRU 7KH DWH 'HSDUWPHQW
'HFHPEHU UHSRUW LQFOXGHV VSHHO & RQVHUFDWLRQ
UHFPPHQGDWLRQV WR EULQJ HDFK VLWH LQWR FRPSOLDQFH
ZLWK WKH 6WDQGDUGV IRU \$FFHVVLELOLW\ IRU DWHU 5HVRX
H\DP SOH UHTXHVWV LQFOXGHG UHFUHDWLRQV DQG RFLDWLRQ
RQ D ;VKLQJ SLHU HQWU\ UDPS PDUNLQJ DQG RQVHUFDWLRQ
SDUNLQJ DQG ORZHULQJ SLHU UDLQLQJV IRU ZKHHOFKDLU
XVHUV WR EH DEOH WR XVH D ;VKLQJ URG RU FUDE WUDS

\$GGLWLRQDO\ DOO VLWHV ZHUH DVVHVVHG IURP D 3XVHU\ V
SHUVSHFWLYH 7KHVH DVVHVVPHQWV ZHUH FRQGXFWHG
E\ VWDII DQG FOLHQWV IURP ,QGSHQGHQWLYLQJ
&HQWHUV ,/&V LQ WKH PLG +XGVRQ DUHD

7KH 6HD *UDQW RFXV \$UHD IRU WH
6XVWDLQDEOH 1HZ <RUN &RDV WDO
1HZ <RUN 6HD *UDQW LV D MRLQW SURJ
WKH 6HD *UDQW 8QLYHUVLW\ RI 1HZ <R
1HZ <RUN 6HD *UDQW ([WHQVLR
5LFH\ DOO &RUQHOO 8QLYHUVLW
HYDOXD\ KLY SURMHFW VQPPDU\ ZDY ZUL
+XGVRQ (VWXDU\ \$SWHLD
QFK #FRUQHOO HGX ZZZ QV

)XWXUH +ROGV ,PSURYHG \$FFHVVLELOLW\ 8QLYHUVLW\ RI 1HZ <R
6XJJHVWLRQV IURP WKH XVHUV\ DVVHVVPHQW DQG
8QLWHG 6SLQDO \$VVRFLDWLRQ HYDOXD\ KLY SURMHFW VQPPDU\ ZDY ZUL
WLRQV ZHUH SURYLGHG WR VLWH PDQD\ KLY SURMHFW VQPPDU\ ZDY ZUL
SULRULWL]H DFFHVVLELOLW\ SURMHFW IRU QFK #FRUQHOO HGX ZZZ QV



1HZ <RUN 6HD *UDQW 7UDZO 'HVLJQ :RUNVKRSV KDYH KH
DQG FRPPHUFLDO WUDZOHUV LPSURYH H[LVWLQJ SURJU

1<6* 7UDZO 'HVLJQ :RUNVKRSV (QK
)LVKHULHV 0DQDJHPHQW DQG &RPPHU

%WWRP WUDZC
ZLGHO\ XVHG W
¿VK DEXQGDQFH
WLRQ WR WKH P
RI WKH ELOOL
/DNHV ¿VKHULH
*UHDW /DNHV DV
SURJUDPV↑ NQR
RQ ERWWRP WU
DQG GHVLJQV O
WKDW RI PDULQ
SURJUDPV



1<6* 5HVSRRGV 7KH LQWHUQDWLRQDO JURXS RI SDUWLFLSDQWV LQ WK
7R LQFUHDVH DZDUHQHV RI WUDZOHUV DVVHVVPHQW DQG FRPPHUFLDO WUDZO
GHVLJQ SDUDPHWHUV 1HZ <RUN 6HD
UDQW 1<6 GHYHORSHG DQG KHOG DO QWHUQDWLRQDO
7UDZO 'HVLJQ :RUNVKRS IRU WKH *UHDW/DNHV LQ
%XLOGLQJ RQ WKH VXFFHVVHV UHVXOWLQJ IURP WKDW
HGXFWRQDO RSSRUWXQLW\ IRU ERORJLWV DQG WUDZO 1<6* C
YHVVO SHUVRQQHO WKH 1HZ <RUN 6HD *UDQW
*UDQW SURJUDPV RUJDQLJHG D VHFRRG ZRUNVKRS
IHDWXULQJ UHQZQH GUDZO GHVLJQ HISHUWV IURP WKH
0HPRULD 8QLYHUVLW\ RI 1HZIRXQG DQG 081
KDYH VHQW WUDZO GHVLJQ SODQV
:LWK 1DWLRQDO 6HD *UDQW 2I¿FH HYDROGRFRRG
ZRUNVKRS LQ KDG D ODUJHU IRFXV RQ WKH
G\QDPLFV RI ¿VK EHKDYLRU DQG WUDZO ERWKHY IRU
DWWHQGHV LQFOXGLQJ ¿VKHULHV IURP 6HD *UDQW 86 *H
IURP 2KLR 3HQVV\OYDQLD :LVFRQWLDWLRQDO 2FHQDQF DQG S
0LQQHVRWD ,GDKR DQG 2QWDULR 081 081 081
WUDZOHUV 1DWLRQDO 6HD *UDQW

:RUNVKRS 0HHWV ,QIRUPDWLRQ 1HHG
:RUNVKRS SDUWLFLSDQWV UHSRUW SDUWLFLSDOO
LQFUHDVHG DZDUHQHV RI WUDZO GHVLJQ SDUDPHWHUV 1HZ <RUN 6HD
DPRQJ WUDZOLQJ SURJUDP PDQDJHPHQW 6HD *UDQW LV D MRLQW SURJ
VXEVTXHQWO\ VXFFHVVIXOO\ PRGLIWHUW DZDUHQHV RQ 8QLYHUVLW\ RI 1HZ <RU
UHGXFH PXVVO FORJLQJ DQG WR GHSORJ IRU 6HD *UDQW ([WHQVLR
DQG XQGHUWUHU FDPHUDV WR HYDOXDWLQJ WUDZO 081 081 081
SHUIRUPDQFH 7KLV SURMHFW VXPPDU\ ZDV ZUL
)LVKHULHV 6SHFLDOLVW 'DYLG %
GEP #FRUQHOO HGX ZZZ Q\



1HZ <RUN 6HD *UDQW 1V &OHDQ 6DIH %RDWLQJ (GXFDW
 IRU NHHSLQJ WKH SXEOLF FXUUHQW RQ UHTXLUHG VDIH
 VRXQG ERDWLQJ SUDFWLFHV DQG PHWKRGV WR UHGXF

1<6* &OHDQ 6DIH %RDWLQJ 3URM
 \$ 0RGHO IRU (GXFDWLRQ DQG ,QGXVW

1H DUO\ RI UHVSRRGHQWV WR WK
 ZLGH 5HFUHDWLRQDO %RDWHUV ([SH
 <RUN 6HD *UDQW 1<6* LQGLFDW
 HQYLURQPHQWDO\ VRXQG ERDWLQJ



1<6* 5HVSRRGV
 ,Q 1<6* LQLWLDWHG D 3'LVFRYHU
 %RDWLQJ SURMHFW WKDW VXFFHVV
 %RDWLQJ ,QGXVWULHV \$VVRFLDWLRQ
 <RUN VKRZ ,W KDV VLQFH EHFRPH D
 SDUWQHUG HGXFDWLRQDO HIIRUW V
 *UHDW /DNHV 1 YHQXH WR VLWHV VW

7KH 'LVFRYHU &OHDQ 6DIH %RDWLQJ YHVVOV SURYLGHG
 E\ 1<6 PDQXIDFWXUHUV DQG ORFDO ERDWHUV HGXFDWLRQDO
 FRPSDQLRQ SURJUDPV HPDQDWLQJ IRU 7KH DUH HTXLSPHQW
 WRRQ FUXLVHU 2VKLQJ FDQRH %RDWLQJ &OHDQ 6DIH %R
 DOO OHJDOO\ UHTXLUHG DQG UHF 7KH 1<6 LVFRYHU &OHDQ 6DIH %R
 (GXFDWLRQ 0HHWV 3XEOLF 'HPDQDWLQJ UHF 7KH 1<6 LVFRYHU &OHDQ 6DIH %R
 7R GDWH -DQXDU\ SHU LPSDFW RQ SDUWQHUV DQG LQ
 † 0RUH WKDQ ERDWHUV SRWHQW ERDWHUV %RDWLQJ 79 VHULHV HSLVRG
 VHHQ WKH H[KLELW DW HYHQW %RDWLQJ 79 VHULHV HSLVRG
 † %RDWHUV KDYH EHHQ HGXFDWHG DW 0RUH ERDWHUV &OHDQ VXEVFULE
 LQ DOO RI 1<6 FRDVWDO UHJLRQV DQ &KXG RQ LQAXHQFLQJ
 5LYHU)LQJHU /DNHV *UHDW /DNHV WR PRUH WKDQ %,\$ ZH
 † PHGLD LQWHUYLHZV KDYH IDW SURJUDP \$SHUHQW %2\$786
 † 1 FDQRH ZDV DGGHG WR LQFOXGH SDG OHVSRUW (QYLURPHQWDO /HDGHUVKLS
 † 2XWUHDFK ZDV GHYHORSHG WR LQFOXGH GHDIERDWHUV
 † %RDWLQJ UHODWHG LQYDVLV VSHFLHV DQG 3DUWQHUV DQG QGXVWU\ \$VVRFLDW
 ZDWHUFUDIW LQVSHFWLRQ HGXFDWLRQ ZDV DGGHG 1HZ <RUN ERDWLQJ LQ QGXVWU\ PDQX
 † ,Q ZDWHU OLIH MDFNHW VDIHW GHPROVWUWLRQV KDYH EXULOHV RZQHUV 1< YHQXH HYHQW
 HGXFDWHG SHRSOH DW IRXU HYHQW &RDVW *XDUG \$X[LOLDU\ PHGLD



7KH 6HD *UDQW)RFXV \$UHD IRU WH
 6XVWDLQDEOH 1HZ <RUN &RDVWDO
 1HZ <RUN 6HD *UDQW LV D MRLQW SURJ
 WKH 6WDWH 8QLYHUVLV\ RI 1HZ <R
 1HZ <RUN 6HD *UDQW ([WHQVLR
 5LFH +DOO &RUQHOO 8QLYHUVLV
 7KLV SURMHFW VXPPDU\ ZDV ZUL
 &RDVWDO 5HFUHDWLRQ 7RXULVP 6S
 GJZ #FRUQHOO HGX ZZZ Q\



1HZ <RUN 6HD *UDQW HQFRXUDJHG LQLWLDWLYHV DUH
 1HZ <RUN VHDIRRG SURGXFWV LQWR ORFDO IRRG V\VVW
 1<¶V FRPPHUFLDO ¿VKLQJ EXVLQHVVHV

1<6* +HOSLQJ WR 'LYHUVLI\ 0DUNH
 1HZ <RUN¶V)DPLO\ 2ZQH G)LVKLQJ %

,QFUHDVHG SXEOLF DZDUHQHVV YLD PDLQVWUHP PHGLD
 FRQWLQXHV WR IXHO WKH ORFDO IRRG V\VVWHPV PRYHPHQW
 LQ 1HZ <RUN 0RUH WKDQ HYHU FRQVXPHUV KDYH D
 ZHDOWK RI LQIRUPDWLRQ WR PDNH GHFLVLRQV DERXW WKHLU
 GLHW WR SURPRWH D KHDOWKLHU OLIHVW\OH \$W WKH VDPH
 WLPH VPDOO IDPLO\ RZQH G DQG RSHUDWHG ¿VKLQJ
 EXVLQHVVHV FRQWLQXHV WR VWUXJJOH XQGHU SUHYDLOLQJ
 HFRQRPLF FKDOOHQJHV

1<6* 5HVSRRQGV

,Q UHFRJQLWLRQ RI WKH QHGV RI FRPPHUFLDO ¿VKLQJ
 EXVLQHVVHV 1HZ <RUN 6HD *UDQW 1<6* RXWUHDFK
 ZDV HQKDQFHG WR HQVXUH WKH LQWHJUDWLRQ RI VHDIRRG
 LQWR WKH 1< IRRG V\VVWHPV PRYHPHQW DQG DOORZ WKH
 EXVLQHVVHV WR FRQQHFW ZLWK WKLV HPHUJHQW PDUNHW
 ,Q 'RFN WR 'LVK D ORFDO HQWHUSULVHV WULDO &RPPXQLW\
 HQFRXUDJHG E\ 1<6* FRQGXFWHG D WULDO &RPPXQLW\
 6XSSRUWHG)LVKHULHV &6) EXVLQHVV PRGHO &6)
 FUHDWHV WKH RSSRUWXQLW\ IRU WKH SXEOLF WR SXUFKDVH
 VHDIRRG VKDUHV GLUHFWO\ IURP FRPPHUFLDO ¿VKLQJ
 HQWHUSULVHV QXWULWLRQ LQ

^Ez ^ 'OE v š]v •]PZ š v v }µOE P u v š Á • 6RXWK)RUNV DQG LQ 1HZ <RUN
]v • š o]•Z]vP šZ (}µv Ÿv v Pµ]]vP %OE]v]%o
 }µOE ^&U v } | š }]•Z]•Z Á]vP šOE u † } 2•YHUZKHOPLOJ &6) UHVSRRQVH J
]v šZ Á Ç }µOE }uupv]Ÿ • Á] Á • (}) šZ š]•XVUH PHPEHU ZDLW OLVW IRU
 Z OE Á • š (OE}u }µOE o } o Á š OE•X
 v } | š }]•i } }OE]v š }OE ^ v
 7KH 'RFN WR 'LVK EXVLQHVV PRGHO LV FRPSULVHG RI
 PRUH WKDQ FRPPHUFLDO ¿VKLQJ DQG ZLOG VKHQ¿VK
 KDUYHVWHUV SDUWQHUV WR 'LVK FRPPHUFLDO ¿V
 EXVLQHVVHV 1RUWKZHVV \$WODQWL

8QGHU WKH WULDO VL[¿VKLQJ YHVVOV VXSSOLHG
 VHDIRRG WR HLJKW KRXXVKROGV DQG VXEVFULSWLRQV IRU
 VROG RXW GXH WR LWV RYHUZKHOPLOJ VXFFHVV

&6) 3LORW 5XQ 3URPSWV 'HVLJHG 65HVSRRQV WDLQDEOH 1HZ <RUN 6HD
 6XFFHVVHV PDGH SRVVLEOH ZLWK 1<6* JXLGDQFH
 LQFOXGH 1HZ <RUN 6HD *UDQW LV D MRLQW SURJ
 † /DXQFK RI D QHZ ORFDO VHDIRRG PDUNHW LQ 1HZ <RUN 6HD *UDQW ([WHQVLR
 EXVLQHVV RQ /RQJ ,VODQG ¶V HDVW 1HZ <RUN 6HD *UDQW &RUHQOO 8QLYHUVLVW
 † VXEVFULEHUV LQ IRXU HDVW HQG FRPPHUFLDO ¿VKLQJ XPPDU\ ZDY ZUL
 ZLOO UHFHLYH D UHJXODU VXSSODUHQHU)LVKHULHV RSHFLDOLVW \$Q
 SURGXFWV SOXV LPSURYHG DFFHVV WR DFRFUDWLRQ HGX ZZZ QV

