

SOLAR POWER

HURRICANE ISLAND CENTER FOR SCIENCE AND LEADERSHIP



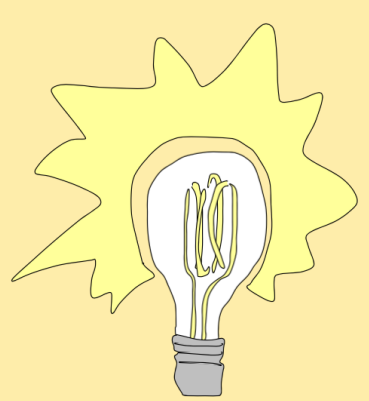
6.7_{kW} OF POWER PRODUCED FROM OUR PHOTOVOLTAIC SYSTEM

1400 AMP-HOURS OF BATTERY STORAGE CAPACITY

24 SOLAR PANELS IN OUR MAIN SOLAR ARRAY ON THE BUNKHOUSE

HOW DO WE USE SOLAR ENERGY?

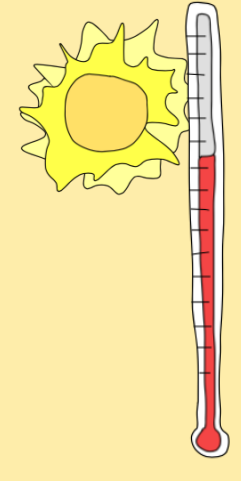
ELECTRICITY & POWER GENERATION:



HURRICANE ISLAND HAS A PHOTOVOLTAIC ARRAY MADE UP OF 24 SOLAR PANELS ON THE BUNKHOUSE THAT POWERS LIGHTS AND OTHER ELECTRICAL APPLIANCES FOR OUR MAIN CAMPUS BUILDINGS.

THERE ARE SMALLER SOLAR ARRAYS THAT PROVIDE POWER FOR OTHER SYSTEMS, INCLUDING THE PUMPS FOR THE WATER & GREYWATER SYSTEMS, LIGHTS IN THE SHOWER HOUSE, FANS IN THE GARDEN GREENHOUSE, AND POWER TO WEATHER AND DATA COLLECTION STATIONS.

SOLAR THERMAL HOT WATER HEATERS:



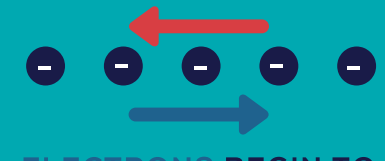
HURRICANE ISLAND'S HOT WATER FOR SHOWERS AND SINKS IS HEATED BY A SOLAR THERMAL SYSTEM ON THE ROOF OF THE SHOWER HOUSE.

THIS SYSTEM IS MADE UP OF A SERIES OF TUBES THAT ARE FILLED WITH AMMONIA. THE AMMONIA IS HEATED BY THE SUN, TRAVELS UP THE INSULATED TUBE AS A GAS, AND MEETS A PIPE THAT IS FULL OF WATER. THE HEAT IS EXCHANGED AND THE WATER IS PIPED DOWN TO AN INSULATED STORAGE TANK IN THE SHOWER HOUSE.

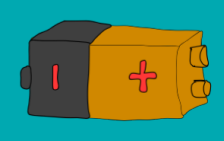
THE SCIENCE BEHIND SUNSHINE: HOW SOLAR SYSTEMS WORK



SOLAR CELLS ABSORB INCOMING ENERGY IN THE FORM OF SUNLIGHT



ELECTRONS BEGIN TO FLOW, GENERATING AN ELECTRICAL CURRENT



WIRING AND BATTERIES CAPTURE THE CURRENT AND STORE IT FOR LATER!

WATER

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120ft

3

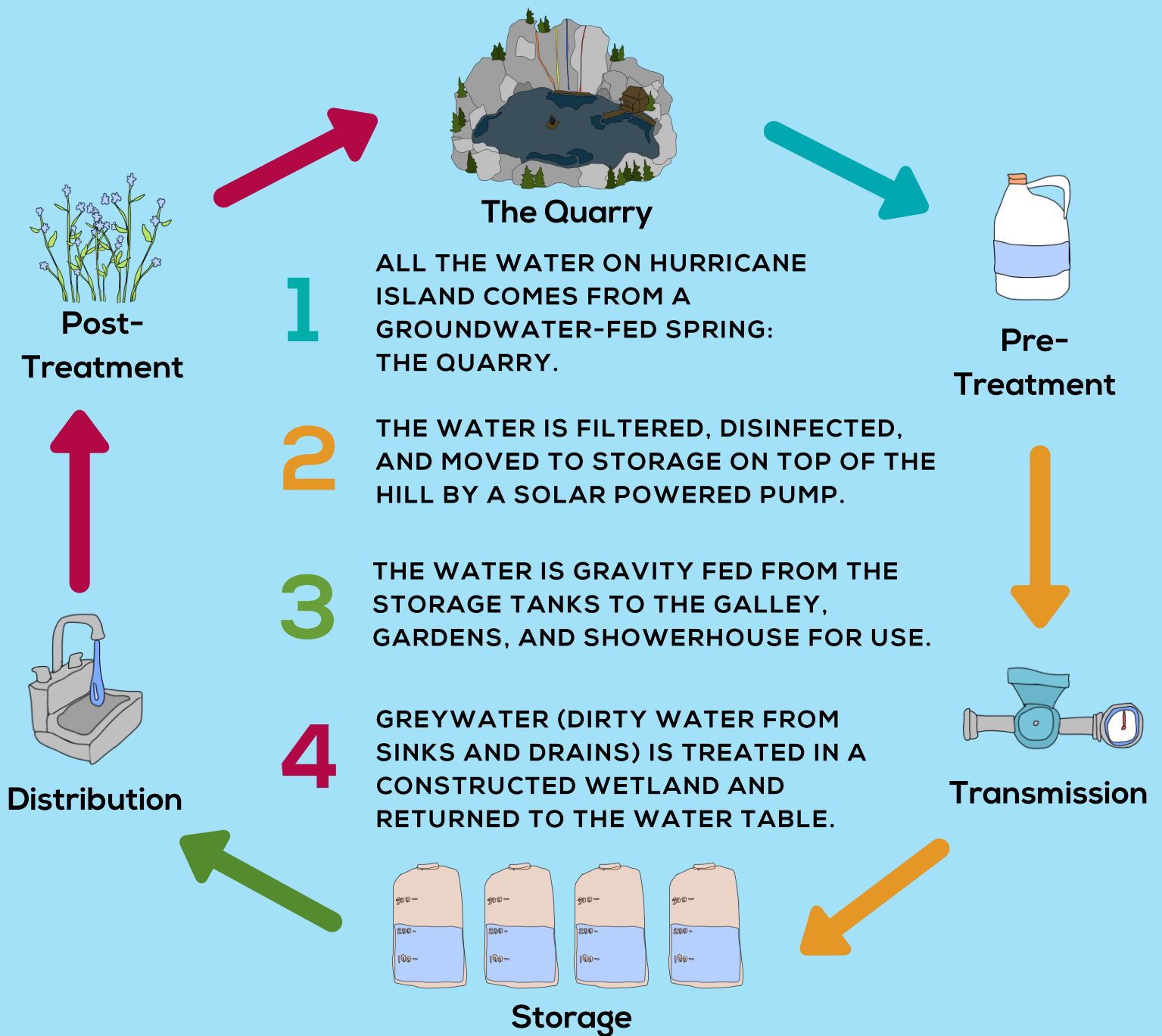
SOLAR ELECTRIC PUMPS USED TO LIFT WATER UP THE HILL

HOW MANY VERTICAL FEET OUR WATER IS PUMPED FROM THE QUARRY TO THE STORAGE TANKS

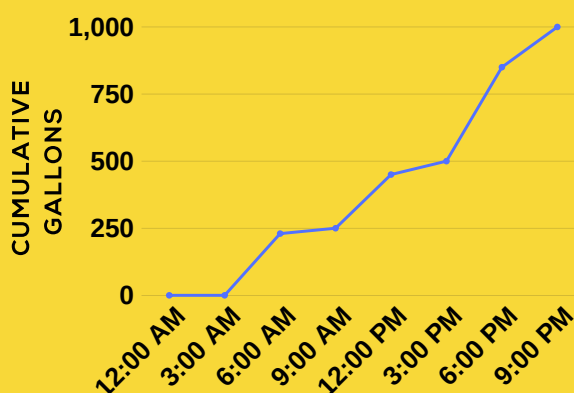
2k

GALLONS OF WATER STORED ON THE ISLAND

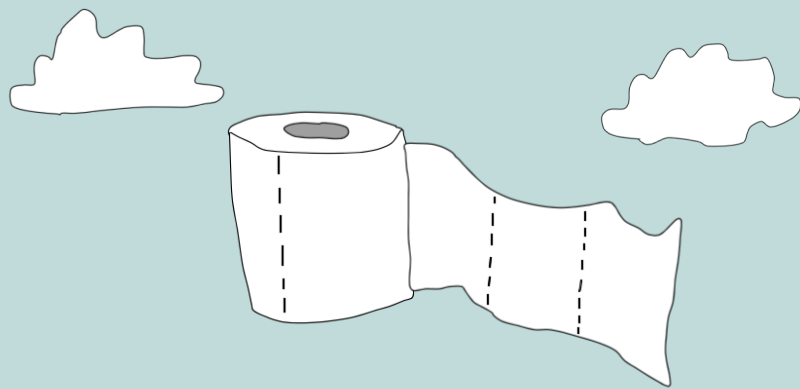
WHERE DOES OUR WATER GO?



ISLAND WATER USAGE



We track how much water we pump and use for different activities throughout the day so we can be mindfull to not waste water!



WASTEWATER

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100%

OF OUR WASTEWATER IS TREATED ON THE ISLAND

2

TYPES OF COMPOSTING TOILET AND OUTHOUSE DESIGNS

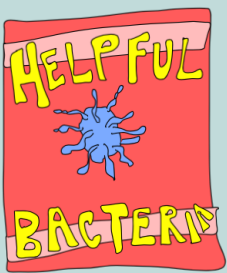
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NO ADDITIONAL CHEMICALS REQUIRED TO TREAT OUR WASTEWATER

HOW DOES OUR WASTEWATER GET TREATED?



HURRICANE ISLAND HAS TWO DIFFERENT TYPES OF COMPOSTING TOILET SYSTEMS THAT BREAK DOWN THE MIX OF HUMAN WASTE, TOILET PAPER, AND ADDITIONAL WOOD SHAVINGS TO PRODUCE A SAFE AND ENVIRONMENTALLY FRIENDLY FINAL PRODUCT.



THE COMPOSTING METHOD IS AN AEROBIC DIGESTION PROCESS; MEANING THAT THE NUTRIENTS AND ORGANIC MATERIAL IN THE MIX ARE BROKEN DOWN BY MICROBES (HELPFUL BACTERIA) IN THE PRESENCE OF AIR. NO ADDITIONAL CHEMICALS NEEDED!



ONCE THE MATERIAL IS FULLY COMPOSTED, THE SOLIDS ARE PRIMARILY CONVERTED TO CARBON DIOXIDE, WATER, AND BIOMASS. THE LIQUIDS BECOME A STABLE NITROGEN-RICH SUBSTANCE THAT CAN BE USED AS A FERTILIZER FOR TREES OR FLOWERS!

HIDDEN WATER USAGE

SOME TOILETS USE BETWEEN 3.5-7 GALLONS OF WATER PER FLUSH!

OUR TOILETS ARE WATERLESS, SO OUR WASTEWATER DOESN'T WASTE WATER.





GARDENS

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300⁺ 40

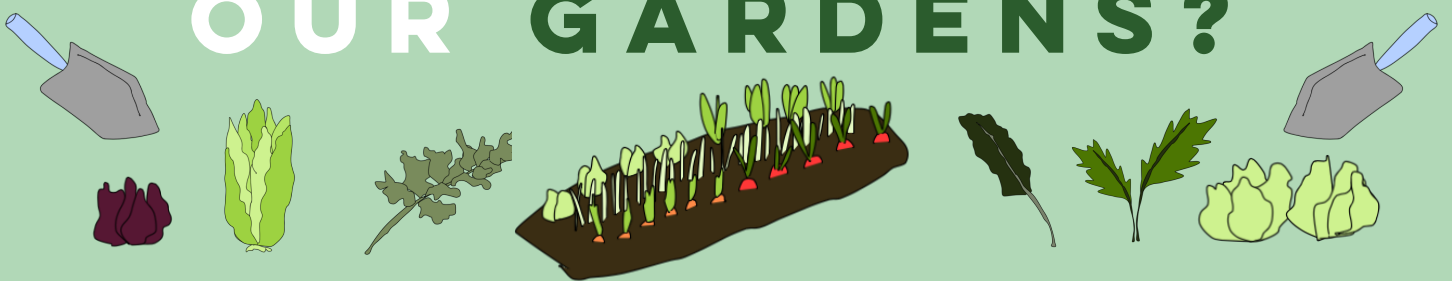
POUNDS OF FOOD
SCRAPS TURNED INTO
COMPOST PER DAY

POUNDS OF PRODUCE
GROWN AND SERVED ON
THE ISLAND IN 2018

2

STAFF MEMBERS
DEDICATED TO
MAINTAINING THE
GARDENS

WHAT IS GROWING IN OUR GARDENS?



WE FOCUS MOSTLY ON GROWING LEAFY GREENS FOR SALADS AND OTHER DISHES. THIS IS BECAUSE THEY'RE EASY TO GROW SUCCESSIVELY IN SMALL SPACES. WE ALSO GROW TOMATOES, HERBS, SQUASH, CUCUMBERS, PEAS, BEANS, AND MORE!

IN 2019, WE EXPANDED OUR GARDENING SYSTEM WITH A BRAND-NEW LOCATION: THE QUARRY ERA'S TOWN HALL FOUNDATION. THIS NEW AREA IS 62' X 46' AND TRIPLES THE TOTAL SQUARE FOOTAGE OF OUR GARDENS!

OTHER NEW GARDEN IMPROVEMENTS INCLUDE A GREENS-WASHING STATION, SOLAR-POWERED FAN FOR THE GREENHOUSE, AND A GARDEN OFFICE THAT HAS STORAGE AND EDUCATIONAL SPACE SO PROGRAMS CAN LEARN ABOUT OUR GARDENING SYSTEM.

WE HAVE FIVE DISTINCT GARDENING AREAS:

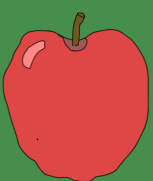
A FLOWER GARDEN, A HERB GARDEN, TWO VEGETABLE GARDENS, AND A GREENHOUSE



FOOD WASTE & COMPOSTING

WE TRY TO REDUCE THE AMOUNT OF FOOD BEING WASTED BY ENCOURAGING PEOPLE TO TAKE ONLY WHAT THEY CAN EAT.

WHEN WE DO HAVE FOOD WASTE, WE COLLECT IT & TURN IT INTO COMPOST THAT IS USED IN OUR GARDENS AS FERTILIZER!





AQUACULTURE

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8000+ 2

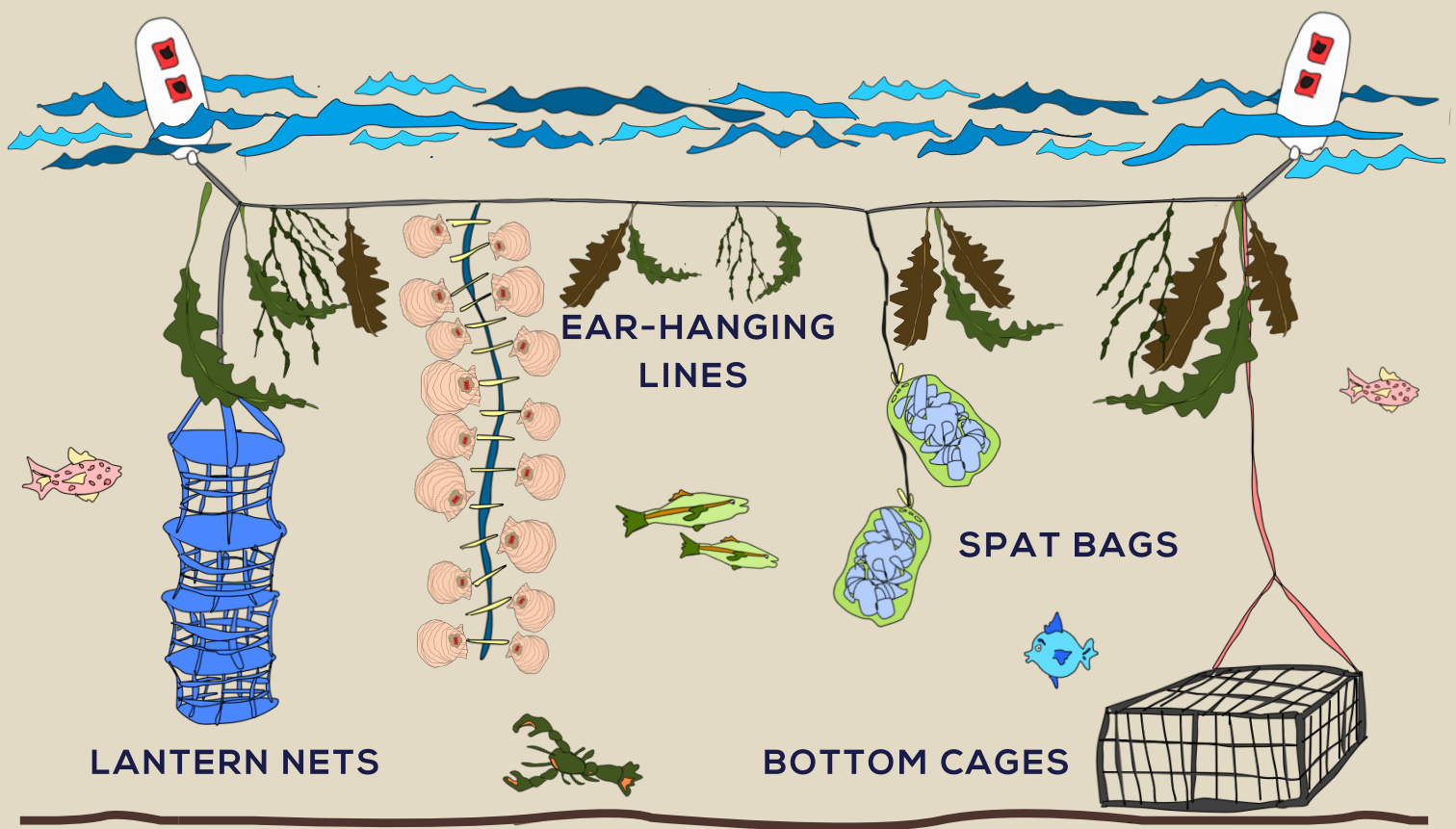
SPECIES GROWN ON OUR
AQUACULTURE FARM:
ATLANTIC SEA SCALLOPS
AND SUGAR KELP

SCALLOPS CURRENTLY
GROWING IN OUR
AQUACULTURE FARM

3.2

ACRES OF OCEAN
USED FOR FARMING

HOW DO WE GROW SCALLOPS?



THE WAY WE GROW SCALLOPS DEPENDS ON THEIR SIZE AND WHAT RESEARCH PROJECT THEY ARE BEING USED FOR.

SPAT BAGS CAPTURE SCALLOPS IN THEIR PLANKTONIC STAGE AS THEY FLOAT AROUND THE WATER COLUMN. THE SCALLOPS THEN ATTACH TO THE SPAT BAGS, GROW TO THE SIZE OF A FINGERNAIL, AND BECOME TOO BIG TO SWIM AWAY. SCALLOPS ARE THEN TRANSFERRED INTO LANTERN NETS OR BOTTOM CAGES WITH DIFFERENT MESH SIZES TO MAKE SURE THEY EACH GET ENOUGH ROOM TO GROW AND WATER FLOW TO FEED. LARGER SCALLOPS CAN ALSO BE ATTACHED TO EAR HANGING LINES, WHERE THEY DON'T HAVE ANY PROTECTIVE CAGES AROUND THEM AND HAVE HIGHER GROWTH RATES.

KEEP IN THE CLASSROOM!

SCALLOPS ARE NOT THE ONLY THING GROWN AT HURRICANE ISLAND'S AQUACULTURE SITE;
WE ALSO GROW KELP!

KELP GROWS SO QUICKLY THAT SCHOOL GROUPS CAN SEED IT IN THE CLASSROOM, DEPLOY IT IN THE SPRING, & COME BACK TO MEASURE ITS GROWTH BEFORE THE SCHOOL YEAR ENDS!