

Illustration by:
Tyasseta • Siloy



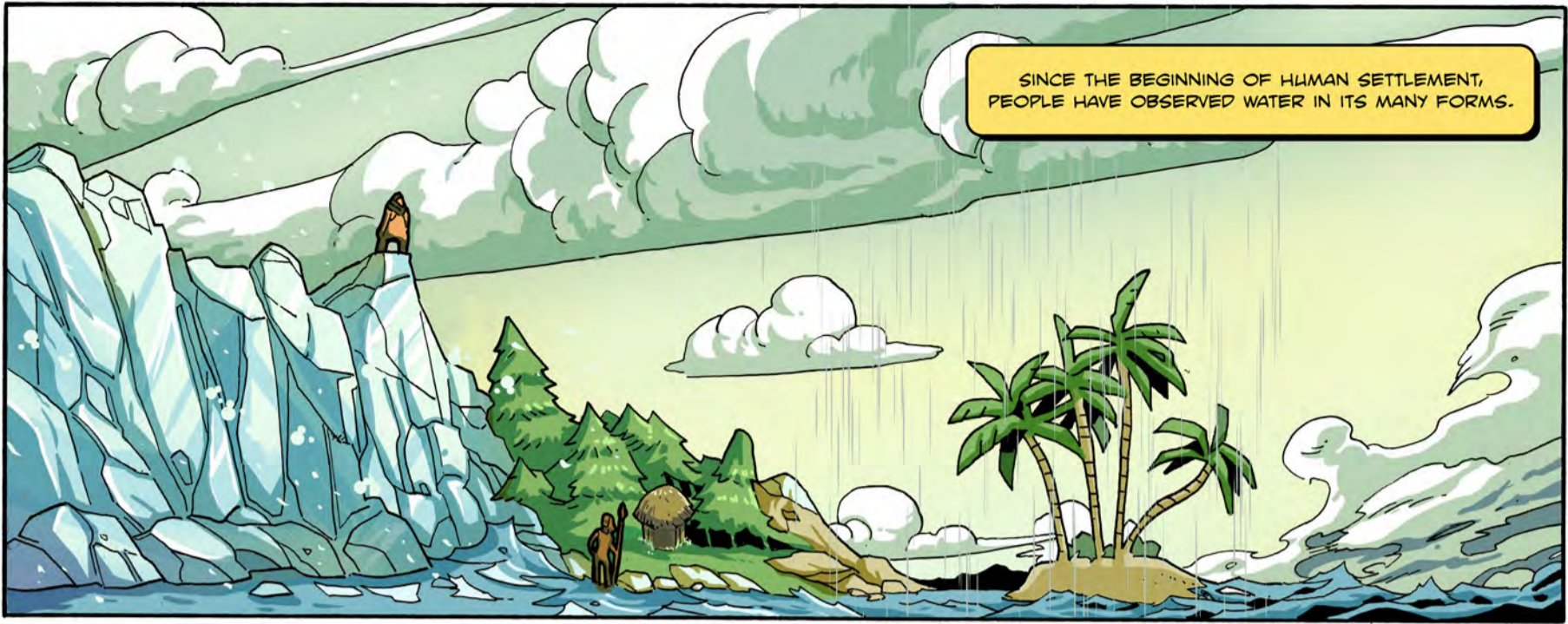
URBAN FORESTRY

Taming Precipita

Van Stan • Friesen

THIS COMIC IS BASED ON A CHAPTER
IN THE BOOK
ADVANCED TOOLS FOR INTEGRATED WATER RESOURCES
MANAGEMENT, CALLED URBAN FORESTRY:
AN UNDERUTILIZED TOOL IN WATER MANAGEMENT BY
J.T. VAN STAN, S.J. UNDERWOOD, AND J. FRIESEN.
ADVANCES IN CHEMICAL POLLUTION,
ENVIRONMENTAL MANAGEMENT AND PROTECTION, VOL. 3, 2018.



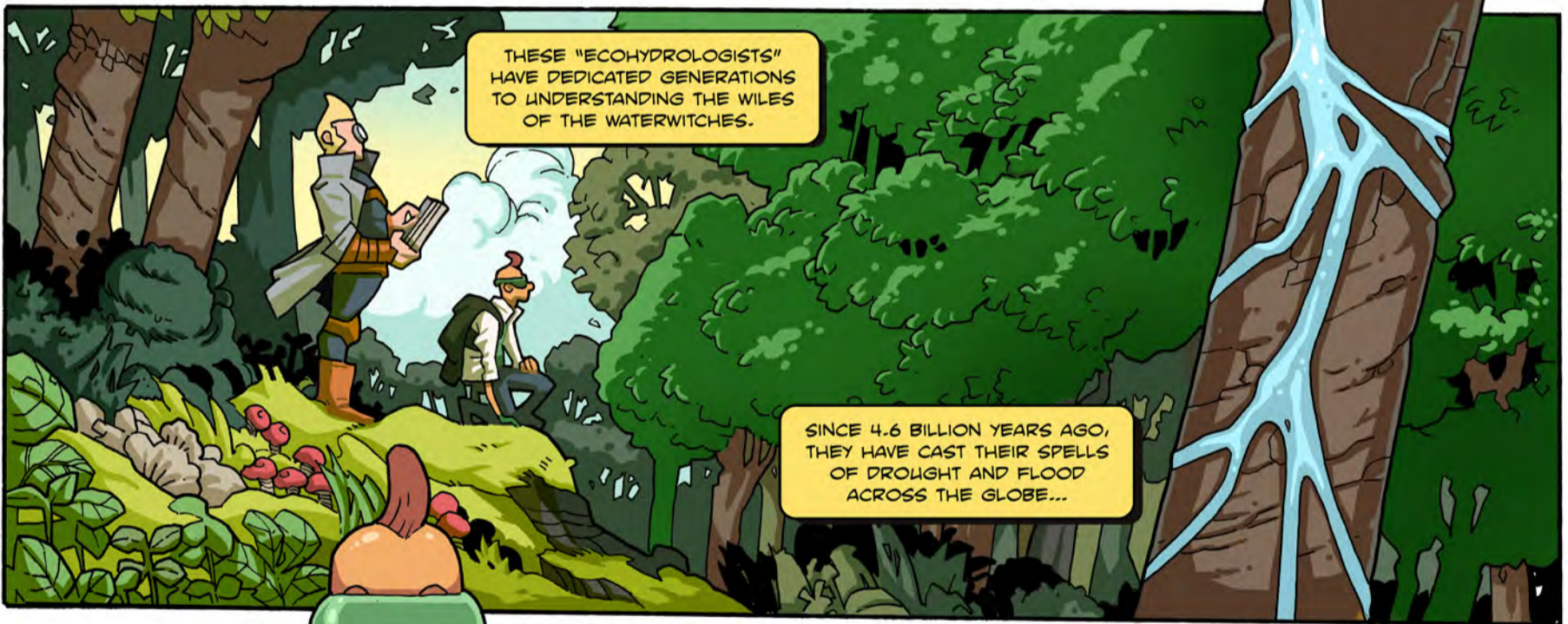


SINCE THE BEGINNING OF HUMAN SETTLEMENT, PEOPLE HAVE OBSERVED WATER IN ITS MANY FORMS.



OVER CENTURIES, THEY HAVE RECORDED THE WAYS THAT WATER SUPPORTS AND SUBVERTS LIFE...

LIKE A CUNNING AND CAPRICIOUS WITCH.



THESE "ECOHYDROLOGISTS" HAVE DEDICATED GENERATIONS TO UNDERSTANDING THE WILES OF THE WATERWITCHES.

SINCE 4.6 BILLION YEARS AGO, THEY HAVE CAST THEIR SPELLS OF DROUGHT AND FLOOD ACROSS THE GLOBE...



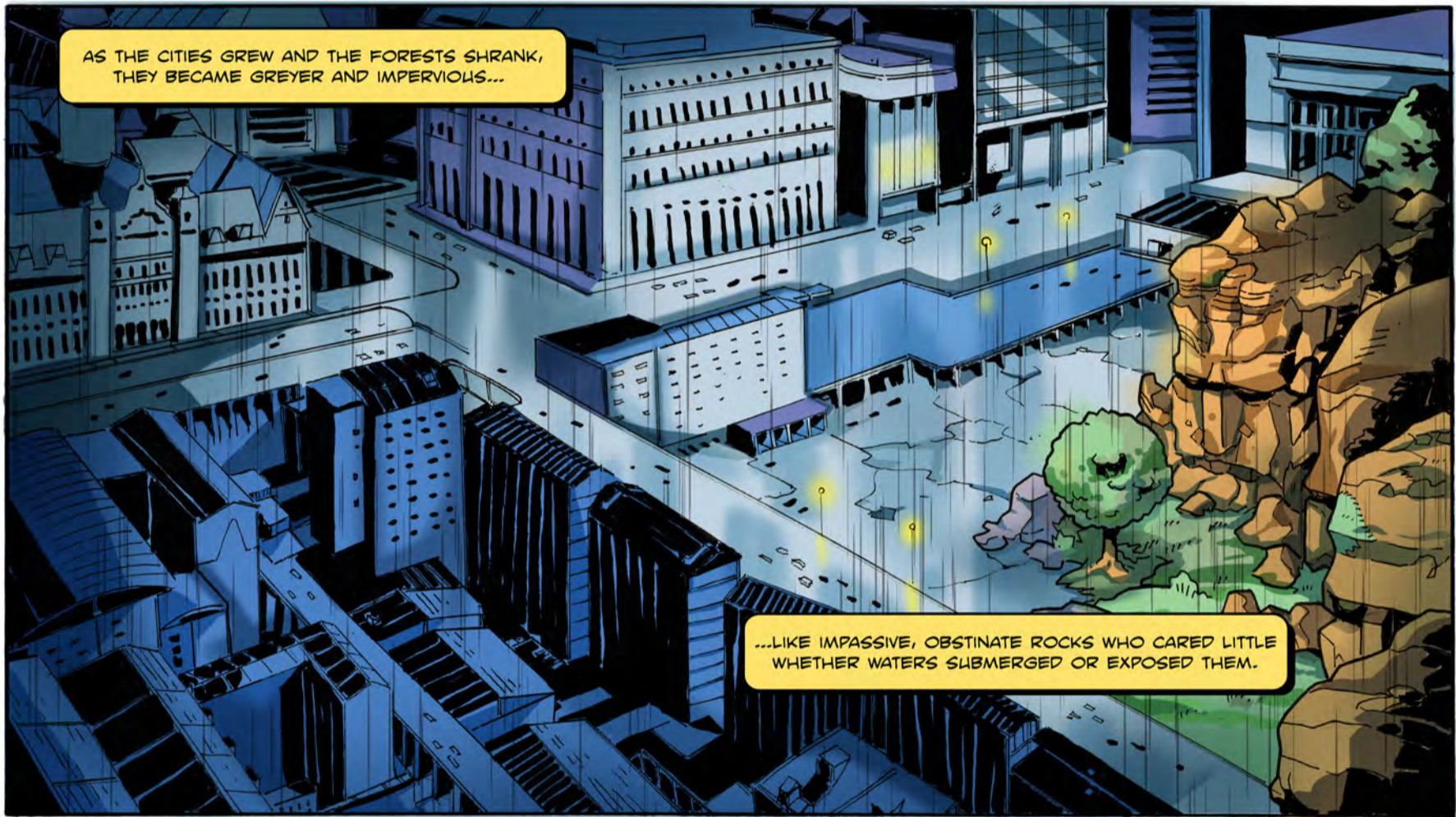
...UNTIL ALL THE EARTH'S ECOSYSTEMS ADAPTED TO THEIR GENEROSITY OR THEIR GREED



AS CITIES GREW,
MOST IGNORED
THE WATERWITCHES.



THEY EVEN SEEMED TO FORGET
THE FORESTS WHO SHELTERED
HUMANITY FROM THEIR WHIMS!



AS THE CITIES GREW AND THE FORESTS SHRANK,
THEY BECAME GREYER AND IMPERVIOUS...

...LIKE IMPASSIVE, OBSTINATE ROCKS WHO CARED LITTLE
WHETHER WATERS SUBMERGED OR EXPOSED THEM.



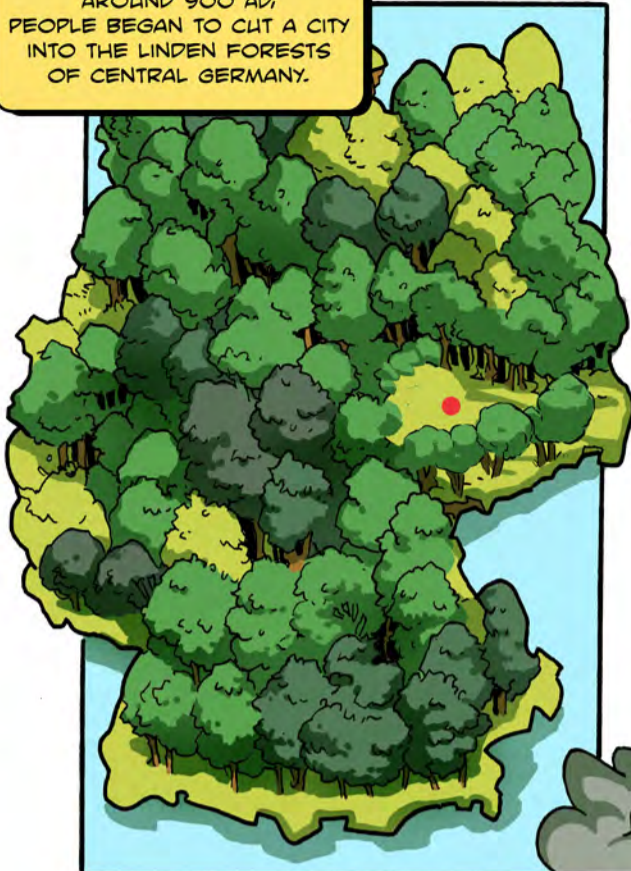
THUS, THE IMPERVIOUS
GREY LANDSCAPE,
FROM THE ROADS
TO THE ROOFS,
ALL JUST WATCHED...



WHILE STORMS, DROUGHT,
AND EROSION TOOK THE HEALTH
AND LIVES OF THEIR
HUMAN INHABITANTS.

THE ECOHYDROLOGISTS WATCHED, TOO,
COLLECTING AND ANALYZING DATA
IN SEARCH OF COMPROMISES
BETWEEN CITIES AND WATER.

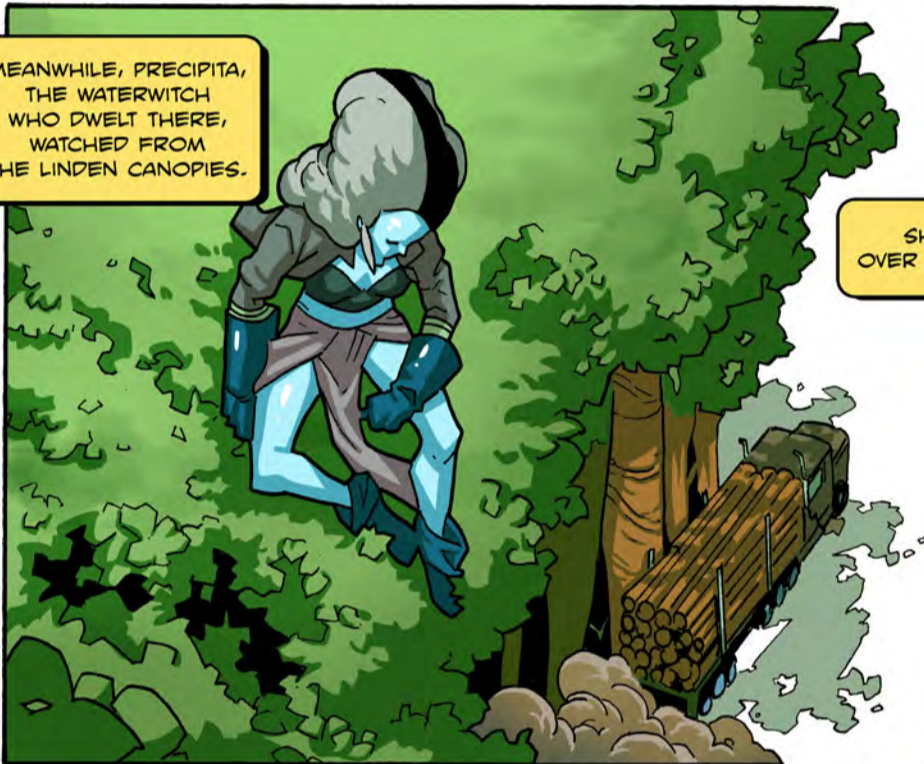
AROUND 900 AD,
PEOPLE BEGAN TO CUT A CITY
INTO THE LINDEN FORESTS
OF CENTRAL GERMANY.



FOR 1,000 YEARS,
THEY CLEARED TREES,
HARDENED THE EARTH,
AND BENT THE STREAMS.



MEANWHILE, PRECIPITA,
THE WATERWITCH
WHO DWELT THERE,
WATCHED FROM
THE LINDEN CANOPIES.



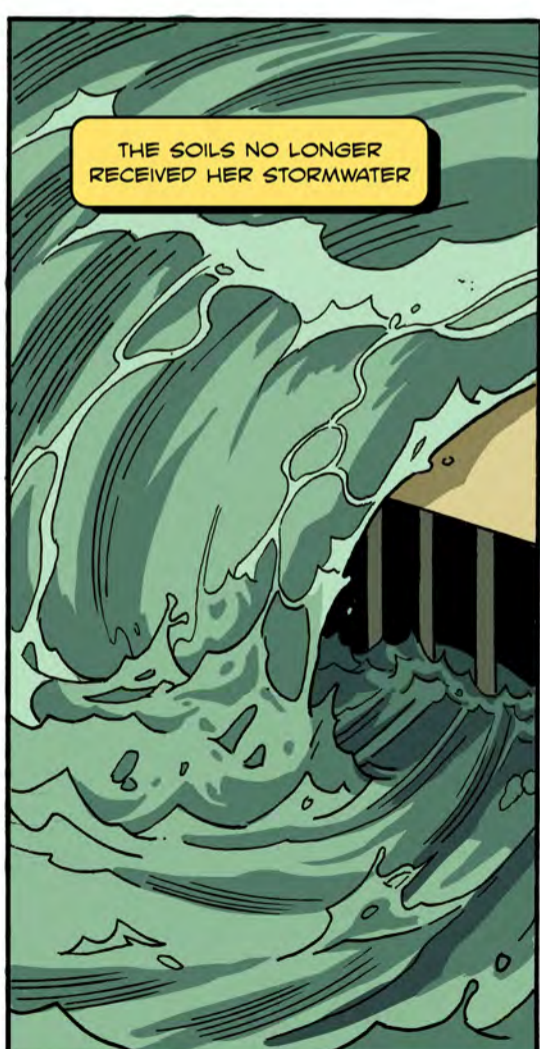
SHE CAST HER SPELLS
OVER THE STORMS AS USUAL,



BUT HER FRIENDS, THE LINDEN,
NO LONGER INTERCEPTED
THE RAINWATER OR DRANK IT
FROM THE SOILS.

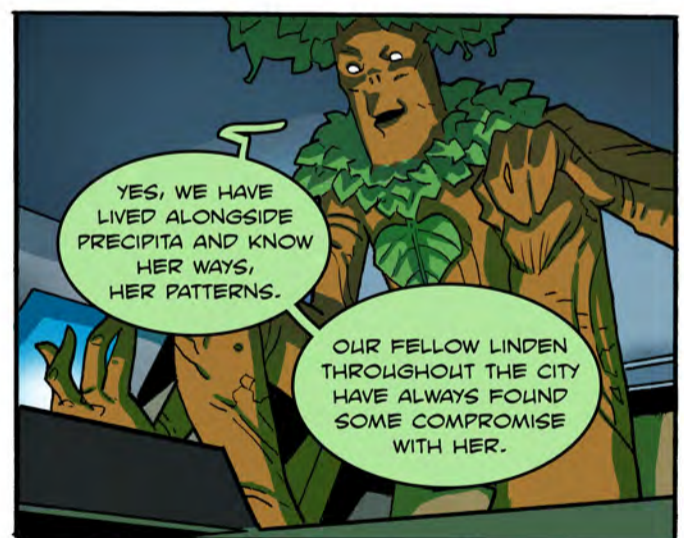
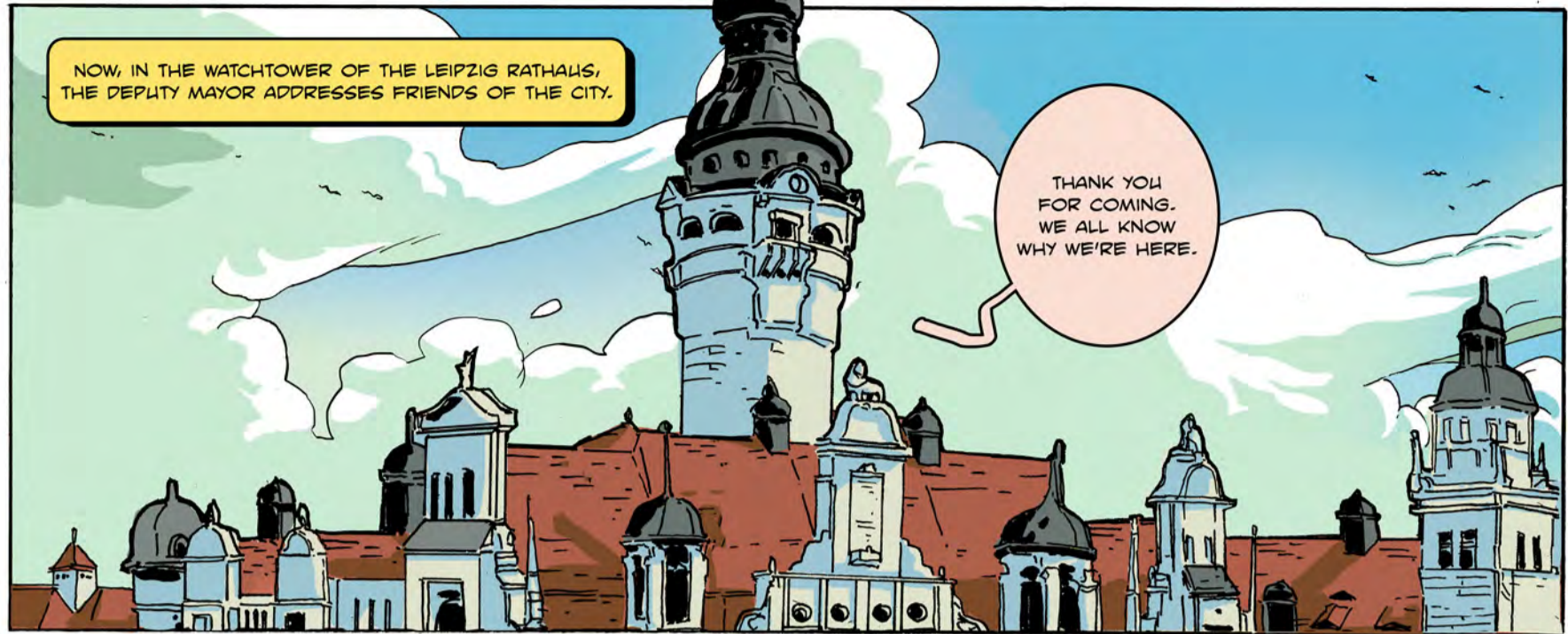


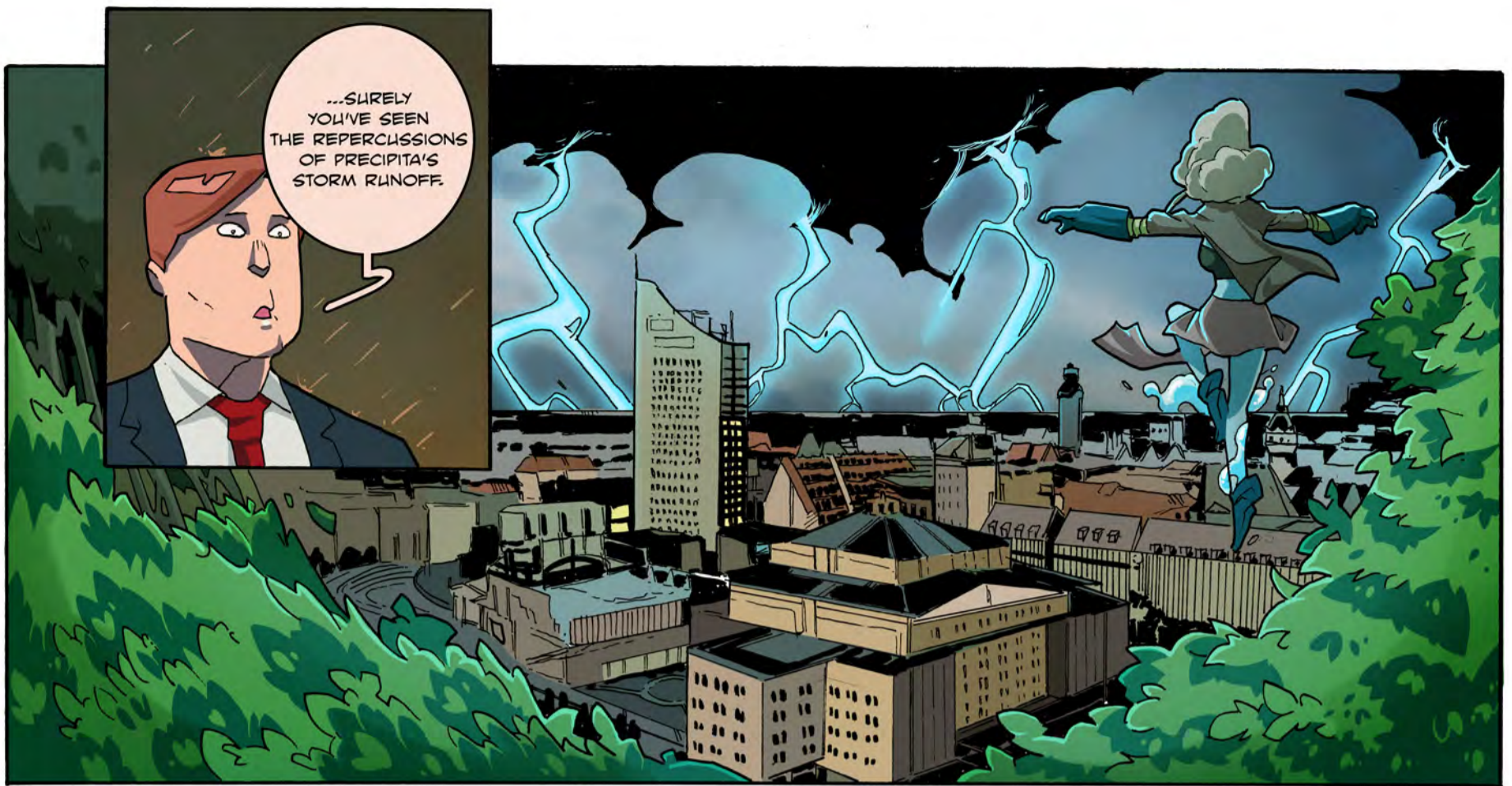
THE SOILS NO LONGER
RECEIVED HER STORMWATER



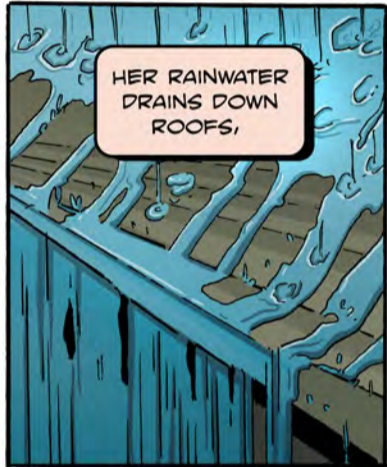
AND THE BENT STREAMS
BEGAN TO SWELL
AND OVERFLOW THEIR BANKS
WITH INCREASING FREQUENCY.







...SURELY YOU'VE SEEN THE REPERCUSSIONS OF PRECIPITA'S STORM RUNOFF.



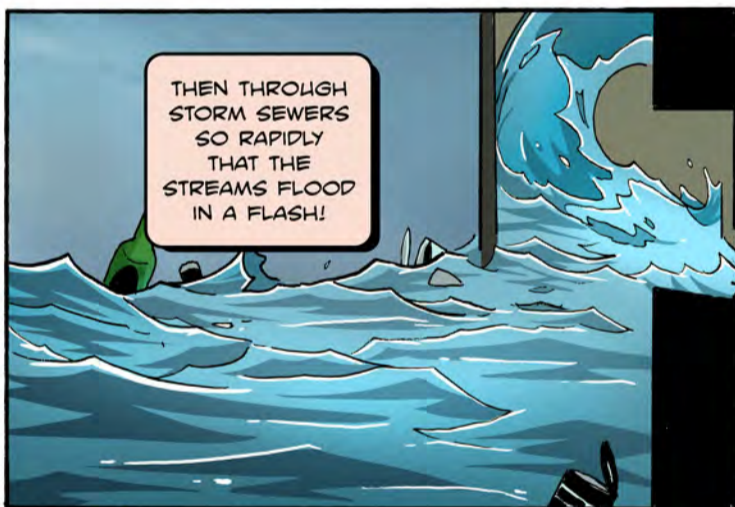
HER RAINWATER DRAINS DOWN ROOFS,



ACROSS THE SIDEWALKS



AND OVER OUR STREETS,



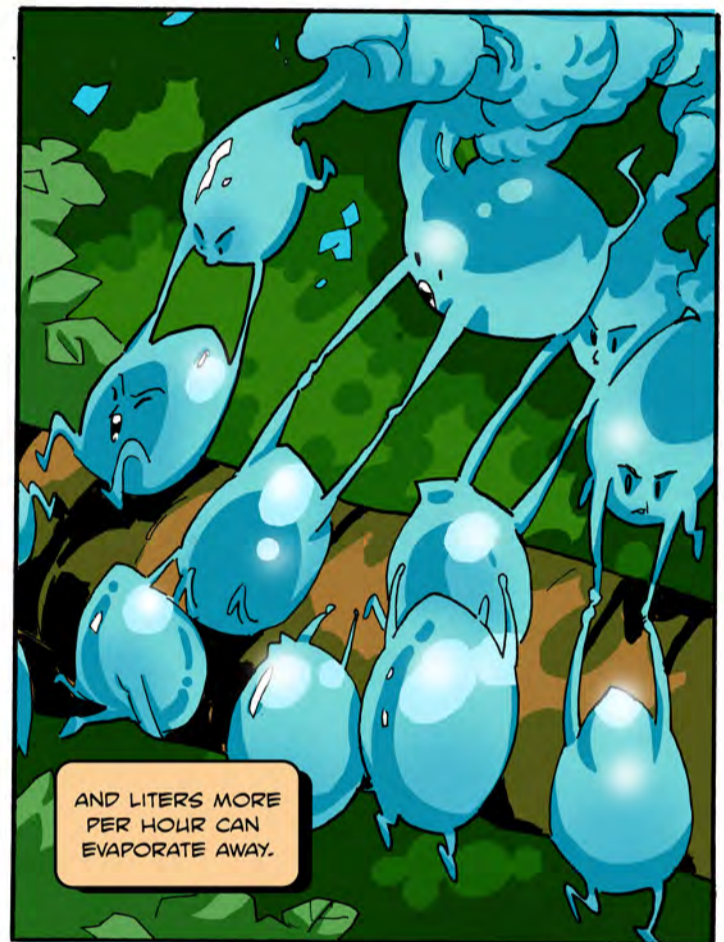
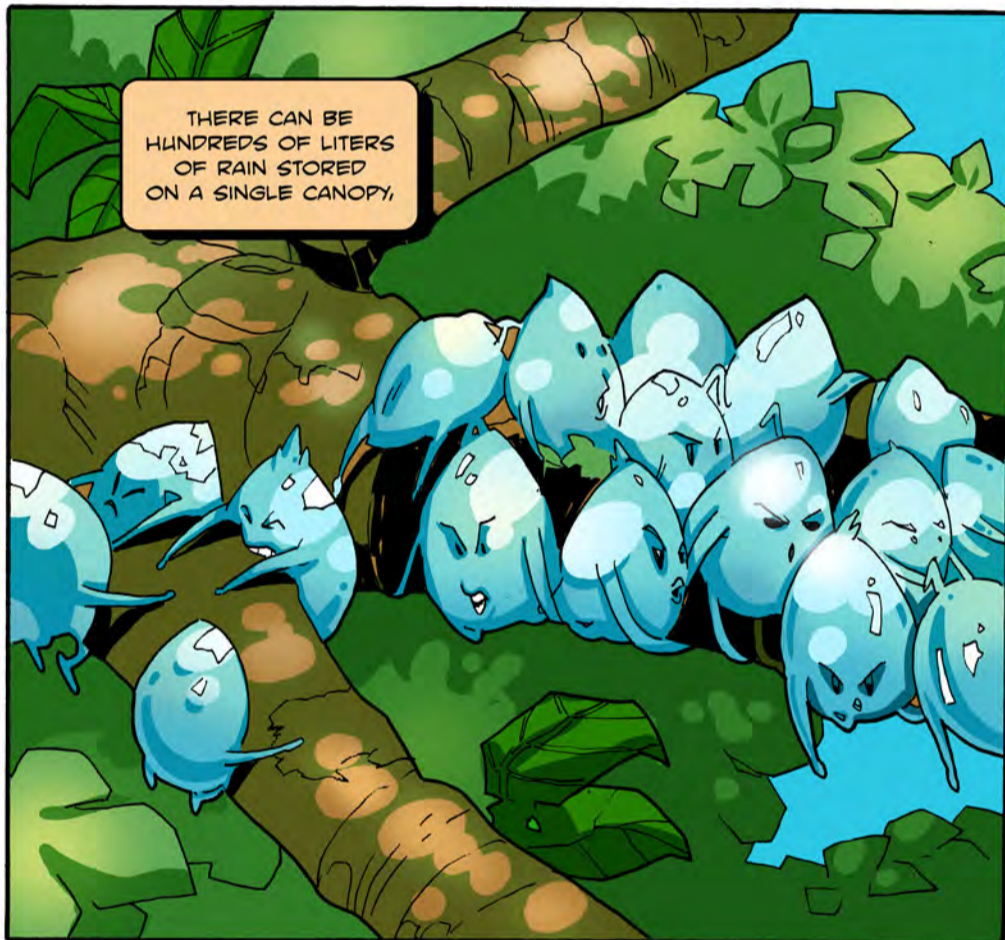
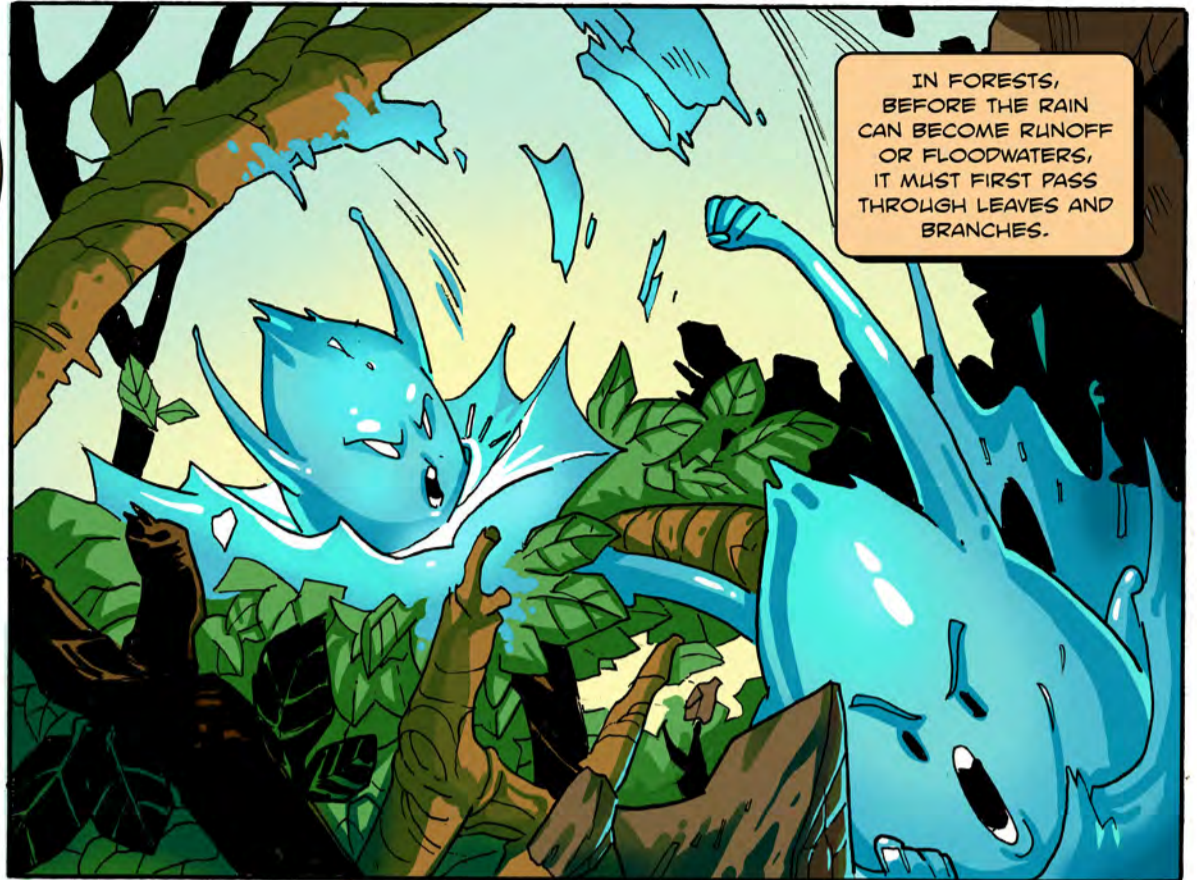
THEN THROUGH STORM SEWERS SO RAPIDLY THAT THE STREAMS FLOOD IN A FLASH!

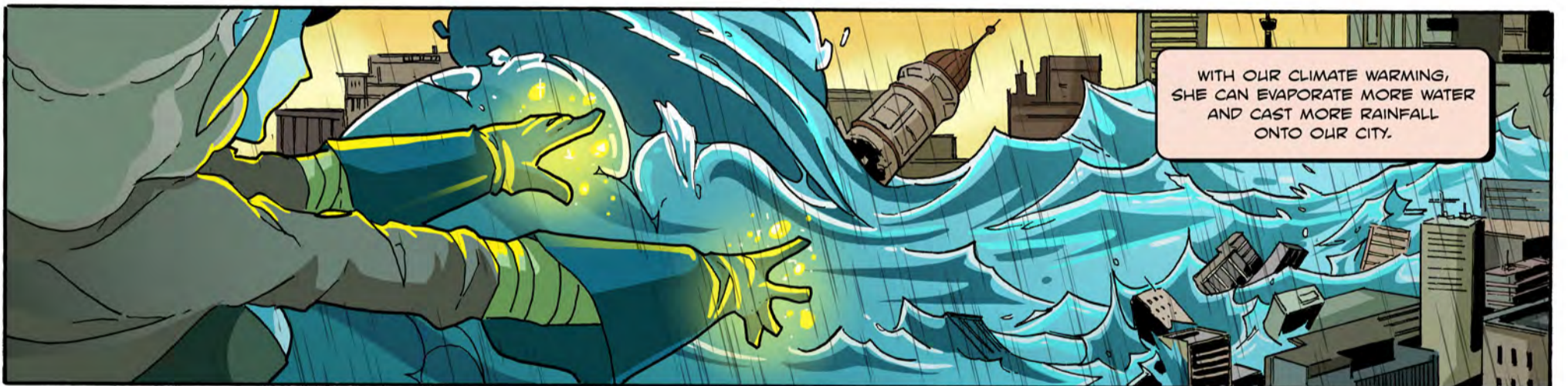
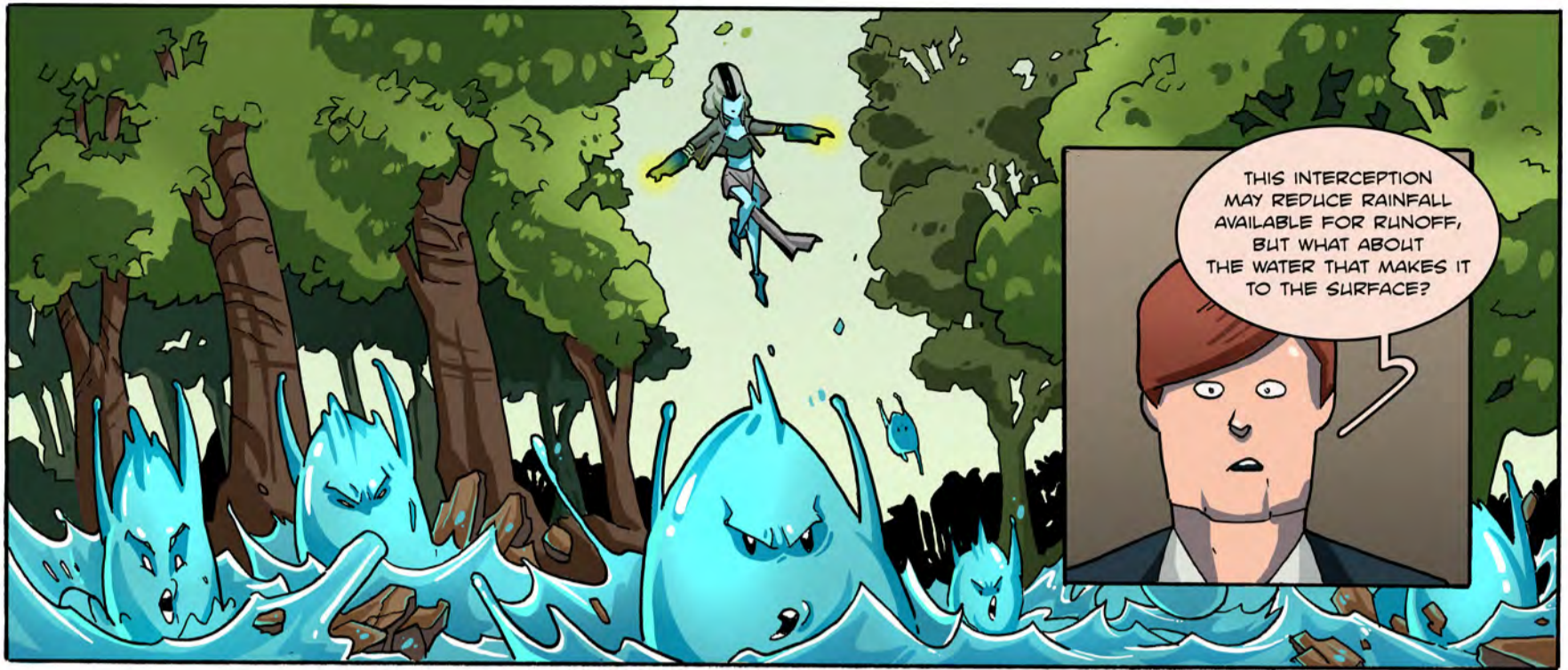


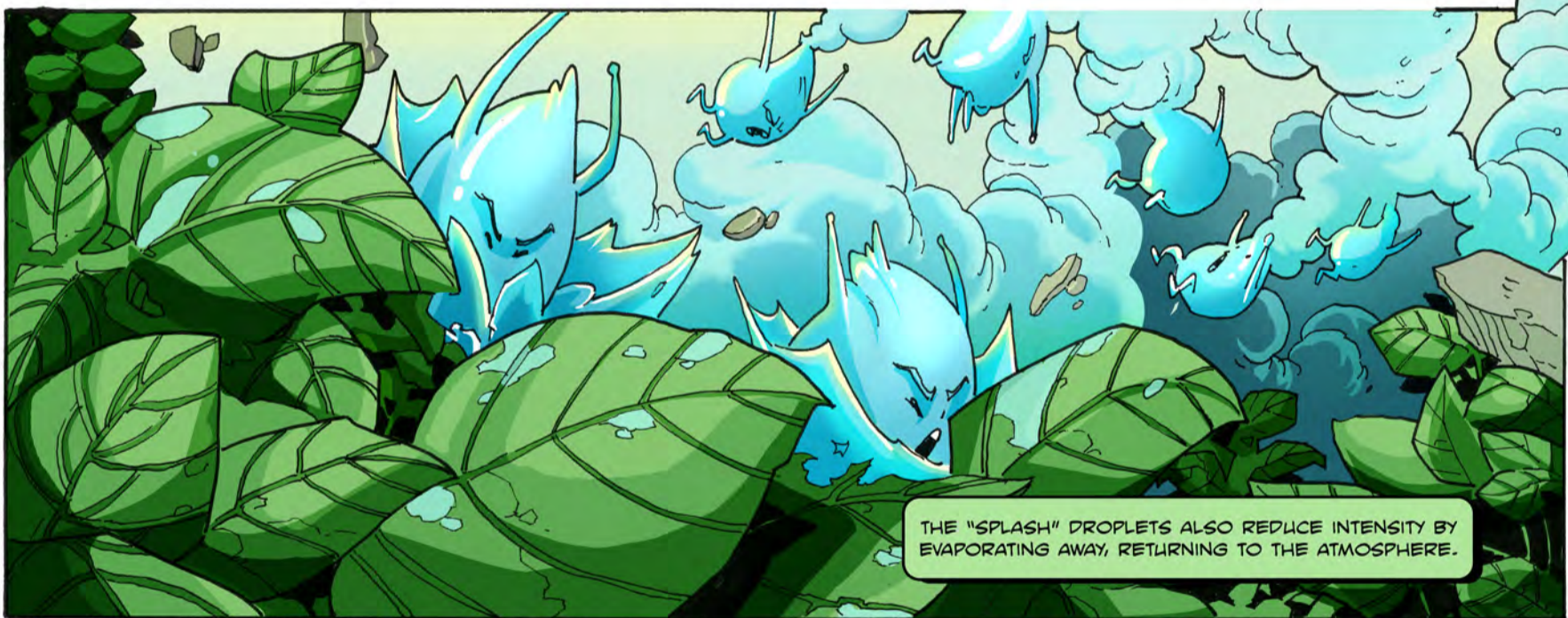
ALL THE WHILE, PRECIPITA'S STORMWATER CURRENTS TEAR APART OUR SOILS-RIPPING DIRT FROM THEIR HILLSLOPE HOMES AND THE NUTRIENTS WITHIN THEM!

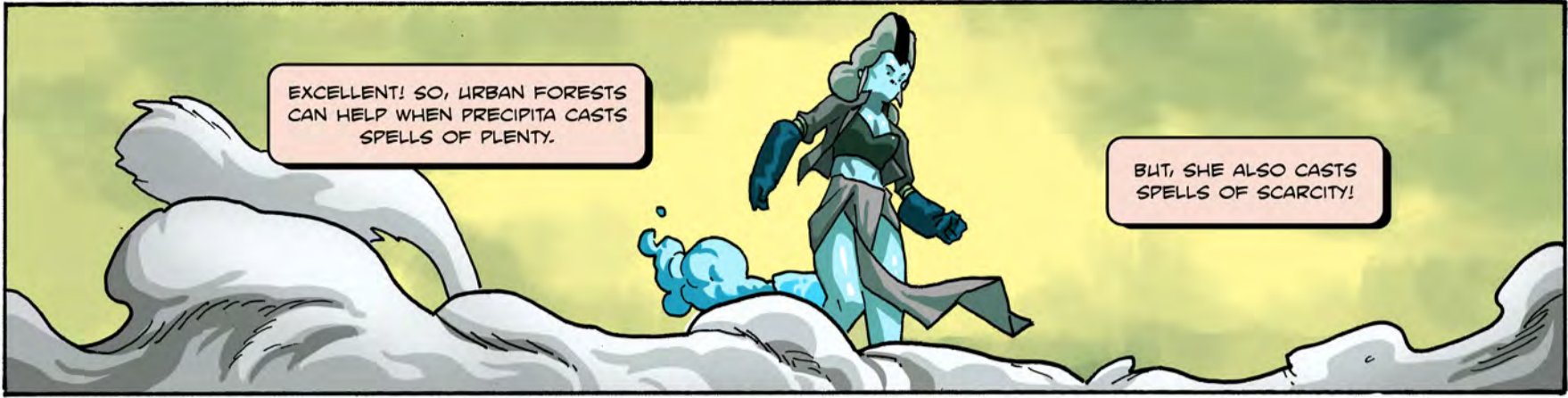


SPEAK TRULY-CAN THE FOREST FIND COMPROMISE WITH ONE WHO WOULD DO THINGS LIKE THIS?









EXCELLENT! SO, URBAN FORESTS CAN HELP WHEN PRECIPITA CASTS SPELLS OF PLENTY.

BUT, SHE ALSO CASTS SPELLS OF SCARCITY!



THE TIMES BETWEEN STORMS CAN BE LENGTHY, WHERE SHE PASSES WEEKS IN A STATE OF UNMERCIFUL GREED.



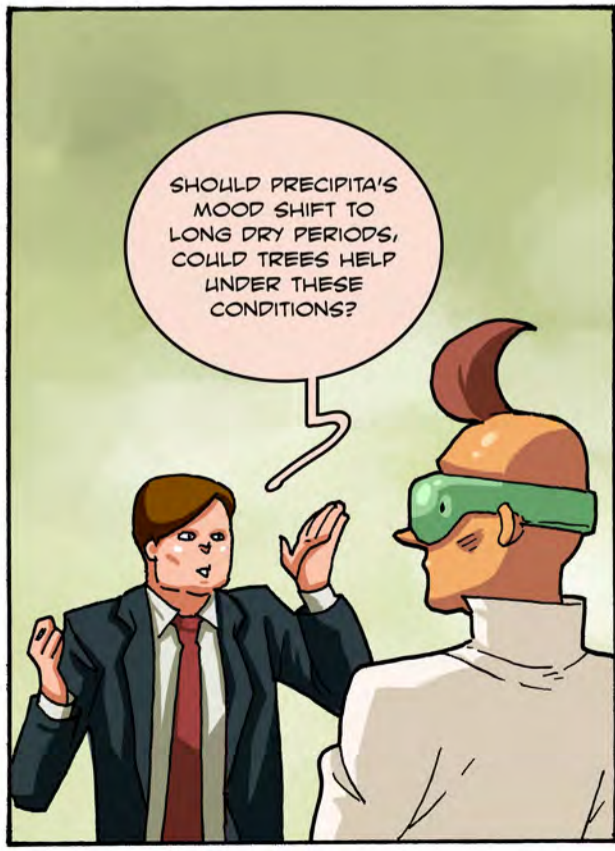
SHE BUSIES HERSELF BY PUSHING THE AIR CURRENTS THAT TRANSPORT MOISTURE AWAY FROM OUR CITY.



IN THOSE TIMES AND IN THOSE AREAS, THERE IS NO OPPORTUNITY TO RECHARGE GROUNDWATER SOURCES



THIS BECOMES A SERIOUS PROBLEM AT THE SURFACE, TOO, AS THESE GROUNDWATERS FEED OUR STREAMS.

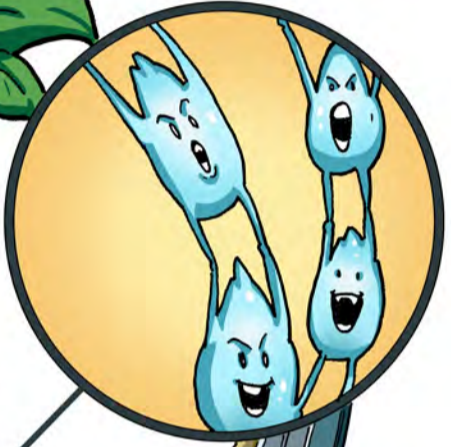


SHOULD PRECIPITA'S MOOD SHIFT TO LONG DRY PERIODS, COULD TREES HELP UNDER THESE CONDITIONS?

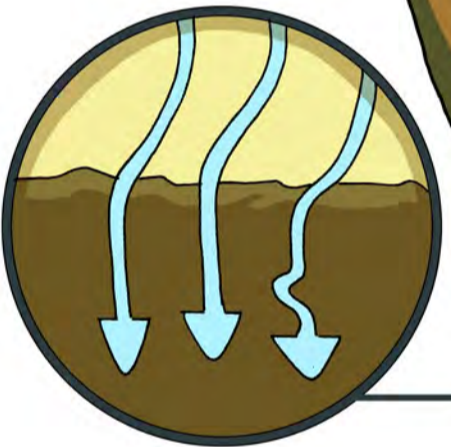


AH! THE TREES HAVE A WAY TO CAPTURE RAINFALL AND, RATHER THAN EVAPORATE IT, DRAIN IT DEEP INTO THE SOILS!

SOME TREES' CANOPIES CAN ACT AS A "FUNNEL," CAPTURING RAINWATER ON THEIR SURFACES AS STEMFLOW.



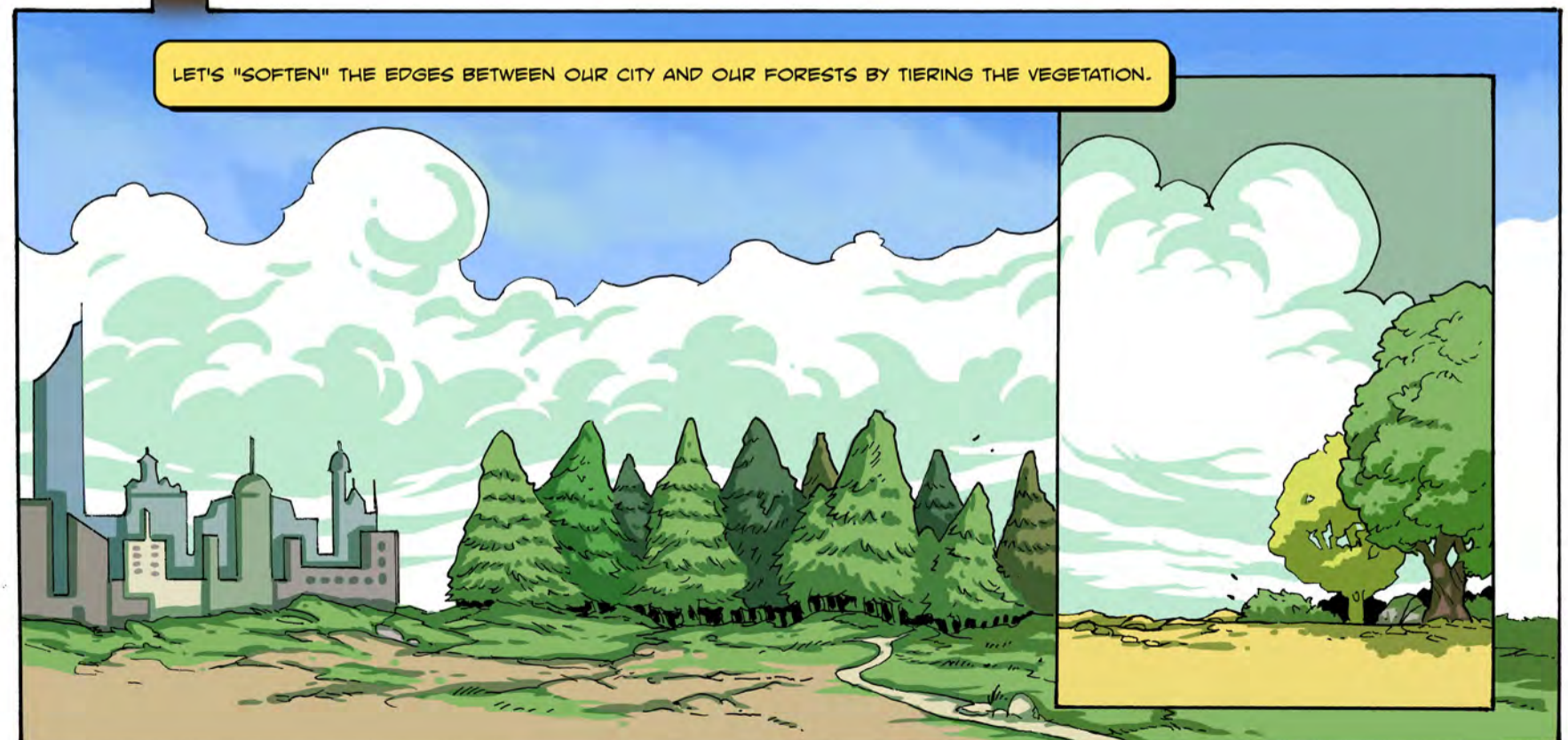
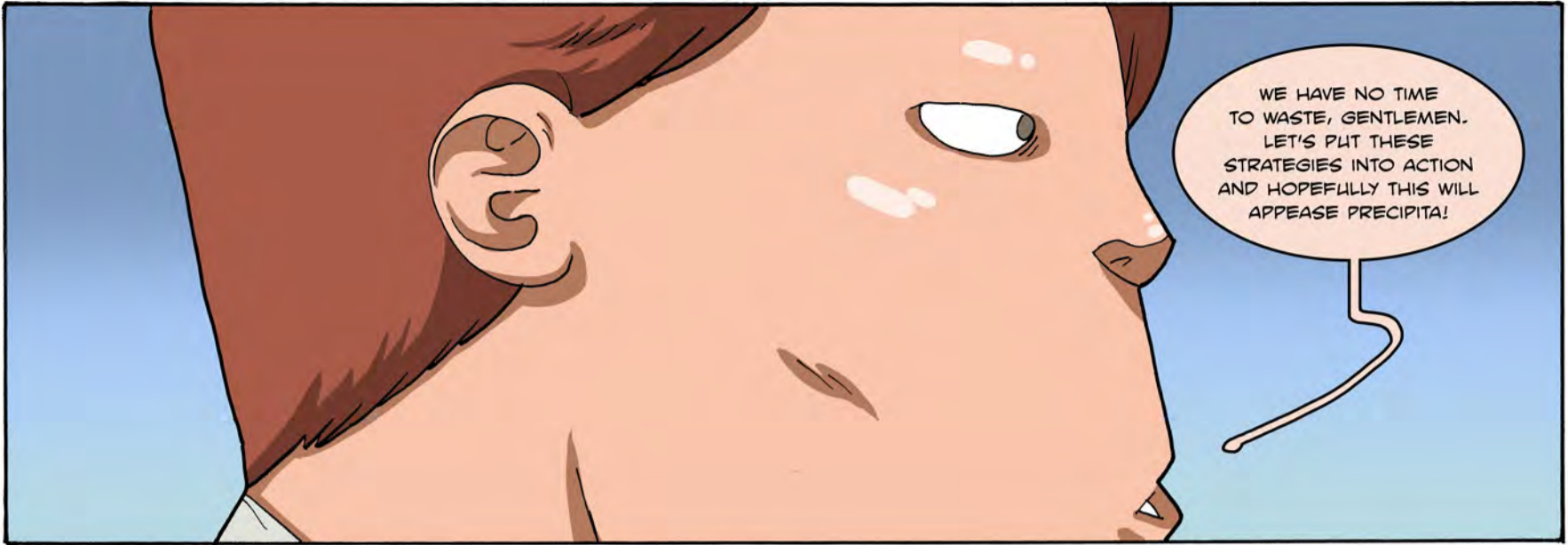
THESE DROPLETS HOLD TIGHT TO THE BRANCHES AND TRUNK AS THEY DRAIN, SUPPLYING ENORMOUS VOLUMES OF WATER TO THE SOILS.



STEMFLOW WATER VOLUMES CAN BE SO HIGH THAT THEY PUSH DEEP INTO SOILS, RECHARGING GROUNDWATERS.



AND, WE CAN INCREASE STEMFLOW INFILTRATION BY PLANTING TREES IN SOILS THAT DRAIN MORE EASILY!





BACK AT THE LEIPZIG WATCHTOWER, PRECIPITA, PLEASED WITH THE CITY'S FORESTRY EFFORTS, JOINS THE DEPUTY MAYOR AND THE FRIENDS OF LEIPZIG.



JOHN VAN STAN
IS AN ECOHYDROLOGIST IN SAVANNAH, GA, USA STUDYING HOW LEAVES, BARK & EPIPHYTES RESPOND TO PRECIPITA'S SPELLS AND WHAT THESE RESPONSES MEAN FOR WATER RESOURCE MANAGEMENT.

JAN FRIESEN
IS AN ECOHYDROLOGIST IN LEIPZIG, GERMANY WHO STUDIES HOW REGIONAL FOREST DYNAMICS INTERACT WITH PRECIPITA'S SPELLS AND WHAT IMPACT FORESTS HAVE ON WATER AVAILABILITY.

TYASSETA
A FATHER. A COMIC ARTIST FROM INDONESIA. OBSESSED WITH AKIRA, MOEBIUS AND AN ACTION JUNKIE.
HIS IG @ST.FAKE

SILOY
A GAME DEVELOPER AT NOON & COLOUR ARTIST AT NIGHT. CURRENTLY PASSIONATELY DEVELOPING FUNTASPLAY A CHANNEL GAME FOR KIDS.
WWW.IKAANSTUDIO.COM

CHARACTERS



HEIKO ROSENTHAL

IS THE DEPUTY MAYOR OF ENVIRONMENT FOR THE CITY OF LEIPZIG, GERMANY THAT IS CONSTANTLY FACING PRECIPITA'S MOODS.



PRECIPITA

BRINGS WATER FROM THE SKY TO THE GROUND, AND IS VERY SENSITIVE ABOUT WHAT WE PUT INTO HER SKY. LET US NOT PROVOKE HER WRATH!



LINDEN

IS A HARDY TREE THAT IS NATIVE TO LEIPZIG AND FRIEND TO PRECIPITA, BUT IT IS ALSO FRIENDS TO WATERWITCHES IN MANY FORESTED CITIES ACROSS EUROPE.



ECOHYDROLOGISTS

WORK HARD EVERY DAY TO SEEK SUSTAINABLE SOLUTIONS TO BALANCE THE WATER NEEDS OF SOCIETY AND NATURE.



HELLO READER! IT'S MY PLEASURE TO INTRODUCE YOU TO TWO CHARACTERS IMPORTANT TO OUR CITY'S WATER MANAGEMENT: PRECIPITA, THE WATERWITCH, AND HER LONG-TIME PAL, THE LINDEN TREE! LINDEN, PLEASE TELL US A LITTLE ABOUT WHERE YOU TWO ARE FROM.



WELL, DEPUTY MAYOR ROSENTHAL, WE'RE FROM LEIPZIG, GERMANY! LEIPZIG, JUST LIKE MANY CITIES AROUND THE WORLD, IS ESSENTIALLY AN URBAN FOREST. MOST CITIES MANAGE THEIR FORESTS TO KEEP THEM HEALTHY AND IMPROVE THEIR COMMUNITY SERVICES. THIS IS CALLED URBAN FORESTRY.



MAKES SENSE! DO ANY OF THE COMMUNITY SERVICES PERFORMED BY URBAN FORESTS INVOLVE PARTNERING WITH THIS STUNNING LADY, PRECIPITA?



I HAVE BEFRIENDED THE FOREST SINCE THE FIRST TREE, OVER 350 MILLION YEARS AGO. THEY ARE THE LAND-DWELLING LIFEFORM THAT RESIDES CLOSEST TO MY ATMOSPHERIC HOME IN THE CLOUDS. THIS MAKES THEM EASY TO INTERACT WITH, BY PROXIMITY--



--ER, I THINK WHAT PRECIPITA IS GETTING AT, IS THAT OUR CANOPIES ARE THE VERY FIRST OBJECTS HER RAIN, SNOW AND RIME CONTACT ON THEIR WAY TO THE SURFACE. BECAUSE OF THIS, URBAN FORESTS SIGNIFICANTLY AFFECT STORMWATER.



WHAT DO YOU MEAN? HOW DOES THE WAY THAT PRECIPITA INTERACTS WITH YOUR CANOPIES AFFECT STORMWATER?



WHEN I CAST MY DROPLETS FROM THE SKY, LINDEN AND HIS URBAN FOREST STOP MANY OF THEM FROM REACHING THE SURFACE--



--WE STOP THEM FROM BECOMING RUNOFF.



EXACTLY. THEY ALSO AFFECT MY DROPLETS' SIZE AND THEIR CHEMISTRY AND THE MICROBES THEY CARRY, AND...



OK, OK - WE GET IT! THE LIST GOES ON AND WE'D LOVE TO HEAR THE WHOLE THING, BUT WE'RE OUT OF SPACE ON THE BACK COVER! IF YOU WANT TO KNOW MORE, PLEASE OPEN THIS COMIC.



Stadt Leipzig

