TPR MAG

翠屏河・誌

CLARITY

澄

Tsui Ping River
翠屏河

Vol.4

根據《說文解字》

澄，清也。

Heraclitus (fl. c. 500 B.C.E.)

**On those who step into the same rivers,
different and different waters flow.**

CLARITY 澄

Taming the Waters:
Advanced Flood Control in Action

上善若水　為河流把脈

善用科技的現代大禹

有沒有想過，要活化一條河道，令它具有排洪功能，又兼具生物多樣性和觀賞價值，背後其實有很多市民難以察覺的先進科技和持續的人為努力，才可確保整個工程順利及安全地完成？尤其面對日益頻繁的極端天氣，我們更要好好掌握相關技術，才可有效地應付氣候變化帶來的挑戰。

在翠屏河的活化工程中，就用上人工智能和各種科技，為河流把脈。比如說，工程期間暴雨快要來臨了，怎麼辦？此時eRAIN人工智能系統會分析從天文台收集到的降雨區域數據，以預測河道水位的變化。當水位不斷上升時，eRAIN會持續監測並發出預警，讓前線人員能夠分秒必爭，提早採取應變措施。

追蹤一滴水的旅程

eRAIN只是活化翠屏河工程中應用到的其中一項科技。在整個歷時四年多的工程中，還有許多一般市民難以看到的系統在默默運作，它們的共同目標就是確保工程順利及安全地完成，讓翠屏河成為市區中一條珍貴的河道之餘，同時有效地發揮排洪作用。

俗語有云：「欺山莫欺水」，可見水之複雜性，河流治理亦然。因此，今期的《翠屏河・誌》，我們透過一滴水的旅程，由它化成雨點從天而降，至落入河道奔流到海，為大家闡釋在防洪和活化河道的過程中，水會變成怎樣？而我們又如何在翠屏河的活化工程中，透過科技，預測水的動向和形態，從而作出最適切的部署。

High-Tech Flood Fighters: Using AI to Stay Ahead of the Storm

Have you ever wondered what it takes to revitalize a river? Creating a waterway that can carry flood waters effectively while supporting diverse wildlife and possessing good aesthetic value requires advanced technology and continued human efforts—most of it unbeknownst to the public. These hidden efforts ensured the safe and successful implementation of the project. As extreme weather becomes more common nowadays, mastering these technologies is essential for tackling the challenges brought about by climate change.

During the revitalization of Tsui Ping River, artificial intelligence and advanced technology were used to monitor the river's condition. Picture this: heavy rain is approaching during construction—what happens next? eRAIN artificial intelligence system kicks into action, analysing rainfall data obtained from the Hong Kong Observatory to predict how water levels in the river will change. As water levels rise, eRAIN continuously monitors the situation and sends out early warnings, giving frontline workers ample time to take response actions early.

Following a Water Drop's Journey

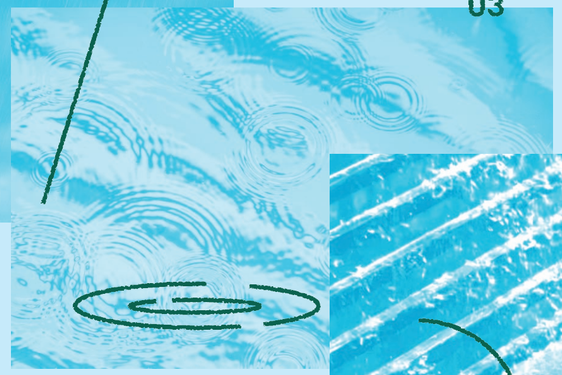
eRAIN is just one piece of the technological puzzle in the Tsui Ping River project. Over four years of construction, numerous systems have been working quietly in the background, invisible to most people. They all share the same goal: ensuring the project's safe and successful implementation, transforming Tsui Ping River into a valuable urban waterway that effectively prevents flooding.

There's an old saying: "You may fool the mountains, but never fool the water"—a reminder of just how complex water can be. River management is equally challenging. That's why in this issue of *TPR MAG*, we're following the journey of a single water drop: from the moment it becomes rain falling from the sky, through its flow into the river, all the way to its egress towards the sea. We'll show you how water behaves during different stages of its journey, and how technology helps us predict and manage water's movements in the Tsui Ping River project, allowing us to make the most appropriate decisions.

01

小雨點
大冒險

02



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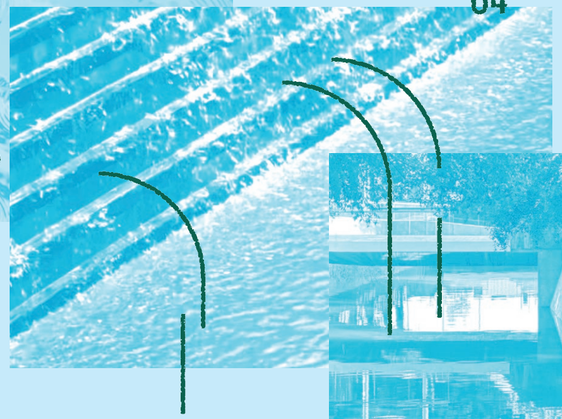

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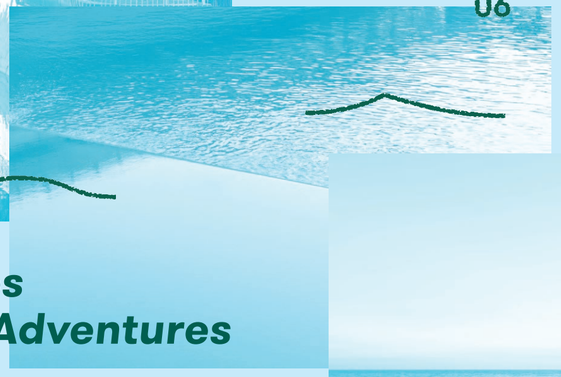


06

07

Little Raindrops
Great Adventures


水在天上
結聚
成雲
Water in
the sky:
The Birth of Clouds

小水滴飛上天空

在自然界中，水的旅程就像一場驚險又精彩的冒險故事。當陽光曬在海洋或陸地的水面上，水分子便像被叫醒的小精靈，開始活躍起來，它們因為受太陽的熱力鼓舞，紛紛蒸發升空，化身成看不見的水氣。隨著高度增加而空氣溫度逐漸下降，水氣遇上漂浮空中的灰塵、鹽粒等微小的「凝結核」，它便像找到落腳點，重新聚合成微小的水滴，積累成雲。當積聚的水滴逐漸增大，終於重得無法再懸浮在空中時，它們便縱身而下，化作雨滴、雪或冰雹重新降臨地面。

相片來源：香港天文台
Image Credit: Hong Kong Observatory

水滴在空中集結，此時，天文台的「小渦旋」要出場了

香港天文台的「小渦旋」(SWIRLS，全名 Short-range Warnings of Intense Rainstorm of Localized Systems) 臨近預報系統，就像一位敏銳的天氣偵探，它的專長是針對未來幾小時內的風雲變幻，無論是傾盆大雨、雷電交加，還是突如其來的冰雹與強風，「小渦旋」都能實時捕捉它們的動態，作出精準預測。這位偵探的推理方法也很有趣——想像你看兩張連續的照片，便能推測一輛車的行駛方向和速度。「小渦旋」也是這樣，利用連續兩次的雷達掃描雲層的數據，分析雨區的移動方式，演算出未來幾小時的降雨量和範圍。當這位天氣偵探「讀懂」了雷達回波的動態，它便會拼湊出一幅移動的雨圖，模擬未來幾小時內的降雨情況，並生成一系列預報圖。而每一格的掃描範圍視乎相關的氣象有所不同，如兩小時降雨臨近預報一般為2000米x2000米。這些數據，為活化翠屏河工程的安全施工及日後運作提供了重要的資訊基礎。

Little Water Drops Take Flight

The journey of water in nature reads like an incredible adventure tale. When sunlight shines upon the ocean or bodies of water on land, water molecules wake up like little sprites, becoming active and energised. Heated by the sun's warmth, they evaporate and rise into the sky, transforming into invisible water vapour. As they climb higher into cooler air, this water vapour encounters tiny floating particles—dust, salt, and other microscopic "condensation nuclei"—which act like landing spots for the vapour. The vapour condenses around these particles, forming tiny water droplets that accumulate into clouds. When these gathered droplets grow larger and become too heavy to stay suspended in the air, they take the plunge, falling back to earth as rain, snow, or hail.

SWIRLS Takes the Stage: Predicting Rain Before It Falls

The Hong Kong Observatory's Short-range Warnings of Intense Rainstorm of Localized Systems (SWIRLS) is like a sharp-eyed weather detective. Its speciality? Tracking atmospheric changes over the next few hours—whether that's torrential downpours, thunderstorms, or sudden hail and strong winds, SWIRLS can capture their movements in real-time and make precise predictions. This detective's method is quite clever—imagine looking at two consecutive photos to figure out a car's direction and speed. SWIRLS works the same way, using data from two successive radar scans of cloud layers to analyse how rain areas are moving, calculating future rainfall amounts and coverage areas. When this weather detective "reads" the radar echo patterns, it pieces together a moving rain map, simulating rainfall conditions for the next few hours and generating a series of forecast images. Each grid's scanning range varies depending on the relevant weather conditions—for example, two-hour rainfall nowcasts typically use 2000m x 2000m grids. These data provides crucial information for the safe carrying out of construction works of Tsui Ping River as well as its future operations.

雨水　從天空降落地面　有東西悄悄地追蹤它的　足跡

When　Rain Falls to Earth:

Something is　Quietly Tracking Its　Every Move

「小渦旋」有個伙伴eRAIN，如黑盒般的預警系統

在活化翠屏河工程中，安全永遠是最重要的。為了保障施工期間工作人員在河道內安心工作，渠務署引入了一位聰明的人工智能助手eRAIN (early Rainfall notification with Artificial Intelligence aNalysis)，實時預測翠屏河的水位變化。它的情報來源正是天氣偵探「小渦漩」每六分鐘發送翠屏河集水區範圍內的降雨預測數據。而eRAIN就像一名勤奮的學生，會透過機器學習方法 (machine learning) 不斷重新訓練和作出分析，從而持續提高預測準確度。它就像人類通過經驗學習一樣，通過收集大量數據學習，隨著數據增加而變得更「聰明」，令它能夠快速推測可能會出現的情況。在學習過程中，系統會不斷調整自己的參數，令準確度進一步提高。

Meet eRAIN: SWIRLS' AI Partner and Early Warning Guardian

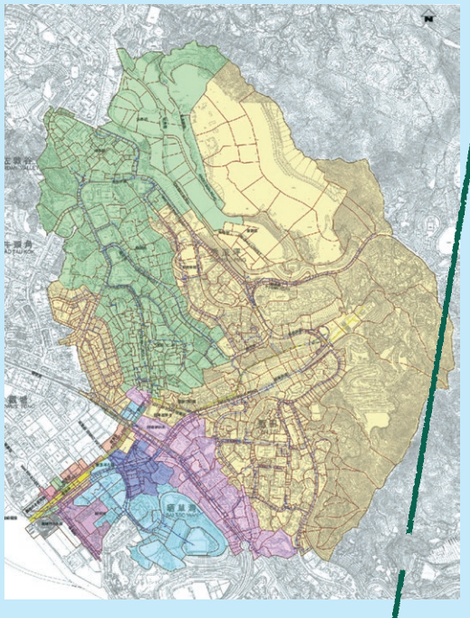
Safety always comes first in the Revitalization of Tsui Ping River. To ensure workers can work safely in the river during construction, the Drainage Services Department brought in a smart AI assistant called eRAIN (early Rainfall notification with Artificial Intelligence aNalysis) to predict the water level changes in real-time. Its intelligence comes directly from our weather detective SWIRLS, which provides the rainfall forecast data for the Tsui Ping River catchment area every six minutes. eRAIN works like a dedicated student, constantly retraining itself through machine learning and analysis to continuously improve its prediction accuracy. Just like humans learn from experience, it gets "smarter" by collecting and learning from vast amounts of data—the more data it processes, the better it becomes at quickly predicting what might happen next. Throughout this learning process, the system continuously fine-tunes its parameters to achieve even greater accuracy.

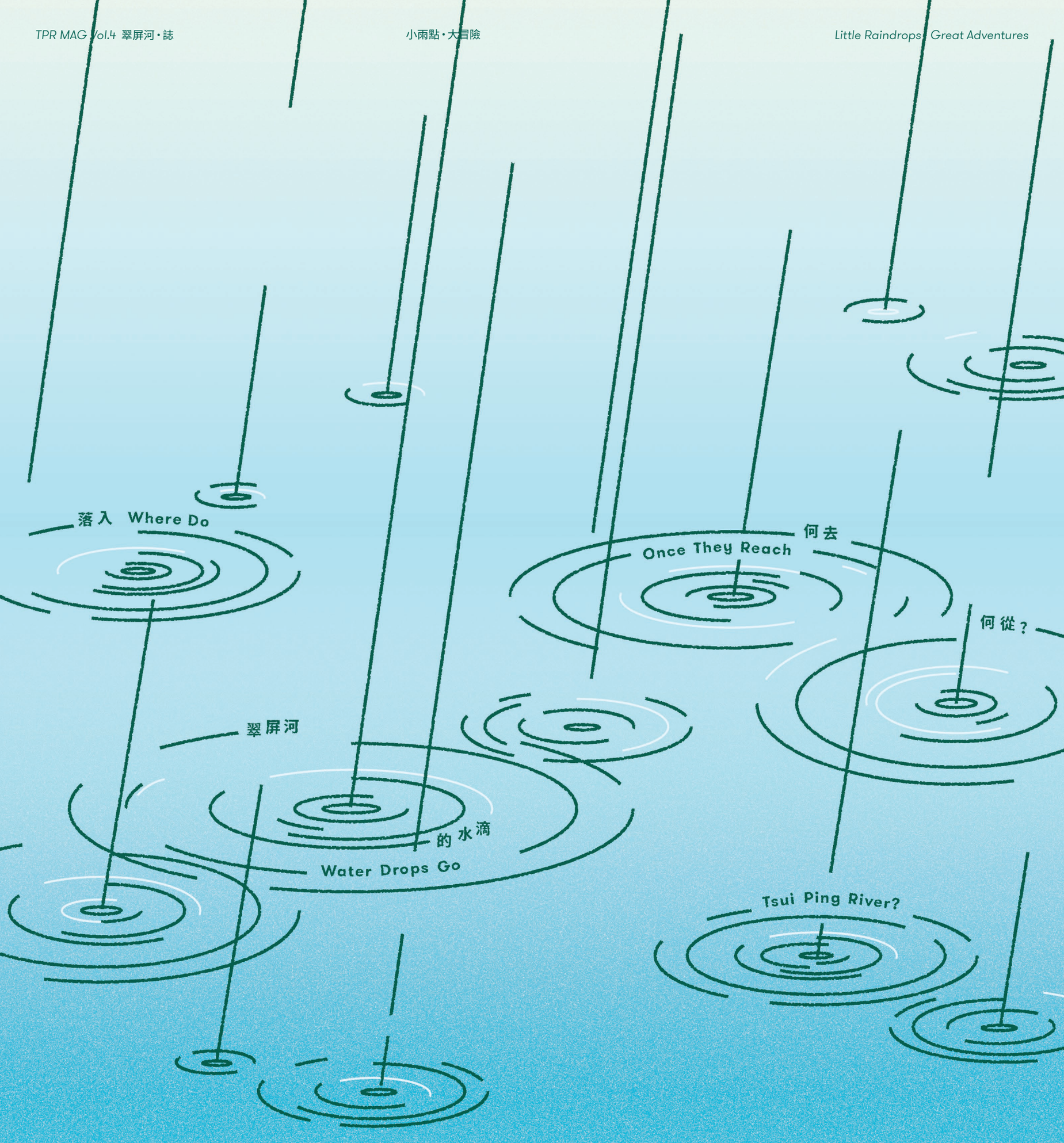
eRAIN的優點

傳統的警報系統在預測特定下游位置的洪水方面會面對不少困難，特別是在施工期間河道狀態會隨工程進展而出現變化，而eRAIN就幫助工程團隊克服了這方面的挑戰。eRAIN利用深度神經網絡(Deep Neural Network)模擬降雨分佈與水位之間的關係，隨著時間推移，該系統能夠自我調整並提高其準確度。

Why eRAIIN Makes All the Difference

Traditional warning systems struggle to predict flooding at specific downstream locations, especially during construction when the river's conditions constantly change as work progresses. eRAIN helps the project team overcome exactly these challenges. Using Deep Neural Networks, eRAIN simulates the relationship between rainfall distribution and water levels, and over time, the system self-adjusts and improves its accuracy.




落入 Where Do
翠屏河
的水滴
Water Drops Go
何去
Once They Reach
何從？
Tsui Ping River?

河水漲了！eRAIN的水位預測，啟動！

水位預測是eRAIN的「看家本領」，而活化翠屏河工程是渠務署首次全面應用eRAIN水位預測功能的建造工程。每六分鐘，eRAIN便會像一位勤快的觀察者，提取實時降雨數據和水位，然後預測河道內的未來水位。如未來兩小時內翠屏河的水位會超過預設界線，eRAIN就會毫不遲疑發出警報，通報給現場工作人員作出適當的應變，如及時停止河床工作及按既定安排撤離。這對河道工程十分重要，一方面可爭分奪秒施工，提高效率；同時可確保工程人員能在洪水來臨之前有充足時間離開現場。

河邊有個水文站，默默監測河流的動向

水在河中翻滾還是緩緩流動，它的神態可以在瞬間「變幻」，但非「莫測」。渠務署在翠屏河的上中下游沿岸設有五個裝有水位傳感器的水文站，24小時收集水位及潮汐數據，實時監測水的動向。水文站就像一個鏡頭，只有一隻滑鼠那麼大，它運用雷達原理，向水面發出超聲波，透過接收反彈上來的超聲波以探測水位的位置，並將資訊實時傳送回到控制中心，經過一套精密系統分析後自動管理及運作翠屏河的設施。

eRAIN in Action: Staying Ahead of Rising Waters

Water level prediction is eRAIN's speciality, and the Revitalization of Tsui Ping River marks the first time the Drainage Services Department has fully deployed eRAIN's water level forecasting capabilities in a construction project. Every six minutes, eRAIN acts like a vigilant observer, collecting real-time rainfall data and water levels, then predicting future water levels in the river. If water levels are forecasted to exceed preset thresholds within the next two hours, eRAIN immediately sounds the alarm, alerting frontline workers to take appropriate action—such as stopping riverbed work immediately and evacuating according to established procedures. This is crucial for construction project within a river: it allows the project team to maximise construction time and efficiency while ensuring workers have enough time to safely leave the site before flood water arrives.

Eyes on the Water: How Gauging Stations Track Every Change

Whether water churns violently or flows gently in the river, its behaviour can change in an instant—but it's not unpredictable. The Drainage Services Department has installed five gauging stations equipped with water level sensors along the upper, middle, and lower reaches of Tsui Ping River. These stations collect water level and tidal data around-the-clock, monitoring water movements in real-time. Each gauging station is like a tiny camera—about the size of a computer mouse—that uses radar principles to send ultrasonic waves toward the water surface. By receiving the reflected ultrasonic waves, it detects water level positions and transmits this information in real-time back to the control centre, where a sophisticated system analyses the data and automatically manages and operates Tsui Ping River facilities.

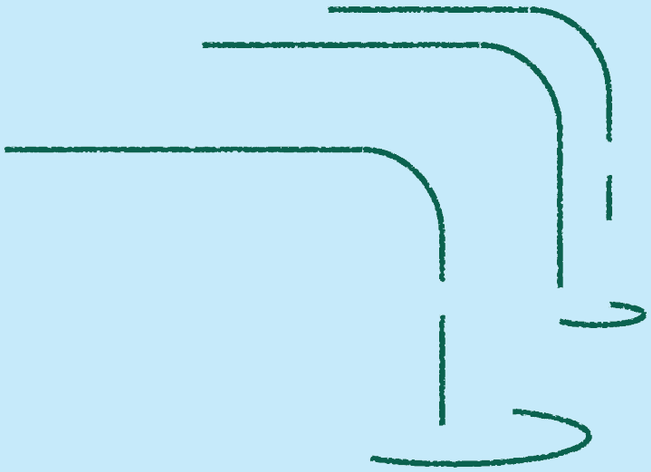

From Sky to Storage:
雨滴 來到 地面
How Every Drop
一點 一滴 被
Gets Captured
儲 起 來

雨點落入一個名為集水區的地方

集水區是指收集水的自然流域或人為的集水設計及結構。每當雨點從天而降，它們就會隨著地形自由流動，進入天然河溪、引水道或人為興建的集水系統，又或滲入泥土成為地下水。因此，落在不同集水區的雨點最終會各奔前程，有些會匯集至水塘儲存，有些則會匯流成河，再匯入浩瀚大海中。

來到翠屏河集水區

翠屏河的集水區版圖廣大，包括了位於安達臣道石礦場、安秀道及秀雅道的地下蓄洪池，以及安達臣道石礦場蓄洪湖，範圍遍及觀塘、秀茂坪和部份藍田地區，面積約達520公頃相當於約27個維多利亞公園那麼大。每當雨雲在這片集水區上灑下甘霖，所有降下的雨點，最終都會經翠屏河流出維多利亞港。

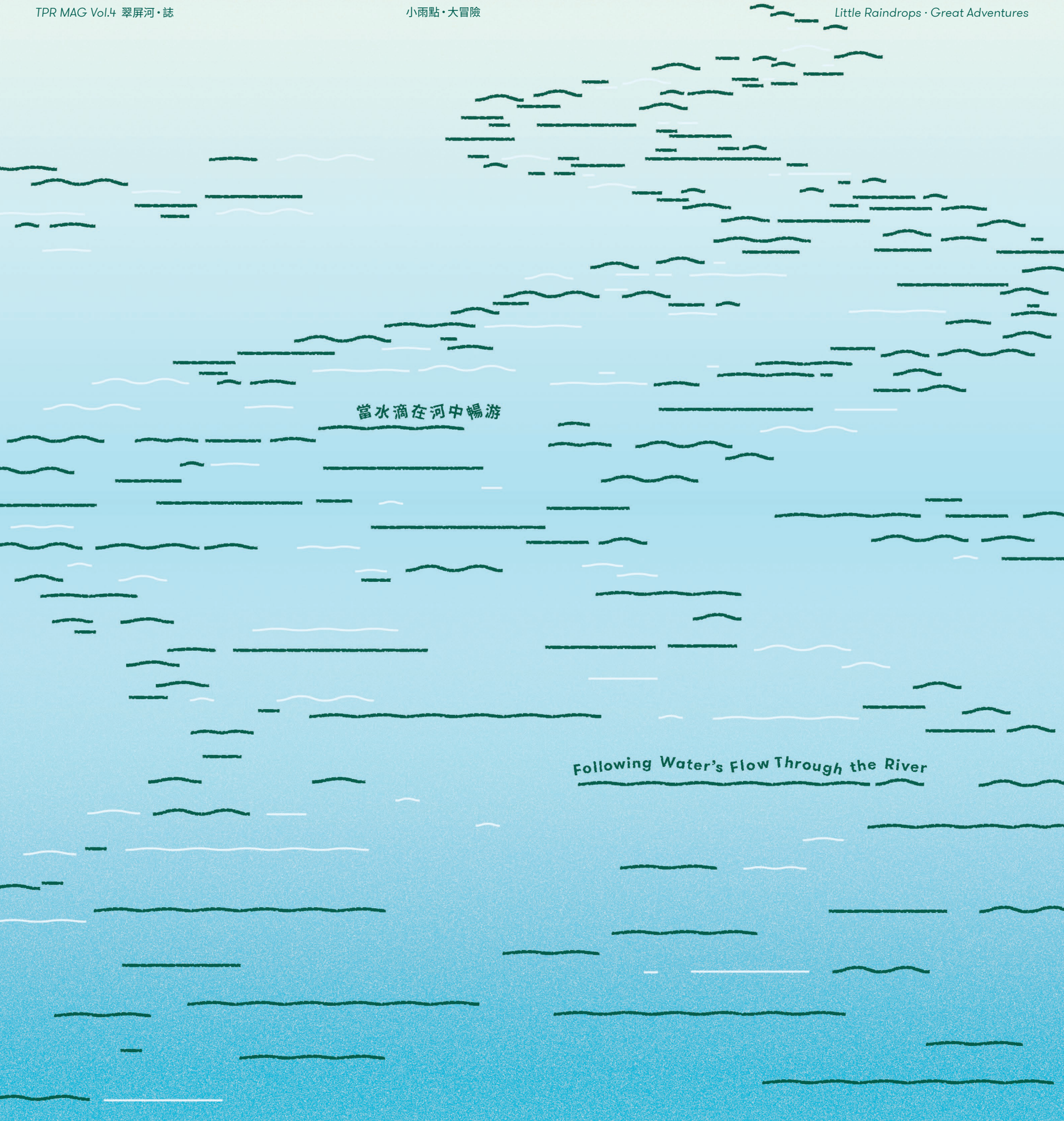


What's a Catchment? The Science Behind Water Collection

A catchment is a natural watershed or human-designed area and structure that collects water. When raindrops fall from the sky, they flow freely according to the terrain, entering natural streams, channels, or man-made water collection systems, or seeping into the soil to become groundwater. Because of this, raindrops falling in different catchments ultimately go their separate ways—some gather in reservoirs for storage, while others flow together to form rivers that eventually reach the vast ocean.

Welcome to the Tsui Ping River Catchment Area

The Tsui Ping River catchment area covers an extensive area, including underground stormwater storage tanks at the Anderson Road Quarry, On Sau Road, and Sau Nga Road, as well as the Anderson Road Quarry Flood Lake. The catchment spans across Kwun Tong, Sau Mau Ping, and parts of Lam Tin, covering approximately 520 hectares—equivalent to about 27 number of Victoria Parks. Whenever rain clouds shower this catchment area, all the raindrops that fall will eventually flow through Tsui Ping River into Victoria Harbour.


當水滴在河中暢游
Following Water's Flow Through the River

有些水滴奔向人工濕地，為濕地生境提供水源

濕地是水與陸地相遇的神奇舞台。它的模樣千變萬化：有如鏡面的魚塘、滿布蘆葦的淡水沼澤森林、盤根交錯的紅樹林，以及潮起潮落間的河口和淺海區域。這些寶貴的自然環境是眾多野生動物，尤其水鳥的理想棲身地，是牠們繁衍、棲息、覓食的樂園。雖然香港的天然濕地大多分布在新界西北，但在市區內，翠屏河近觀塘游泳池的位置，就有一片約200平方米的人工濕地，巧妙地運用河水，透過引流、過濾和淨化的過程，模擬天然濕地的生態系統。這片濕地猶如戶外教室，不僅展示了濕地的生態價值，更提醒著大家要愛護河流，避免污染物流入雨水收集系統。

河道出現機械人！清淤工作，開始！

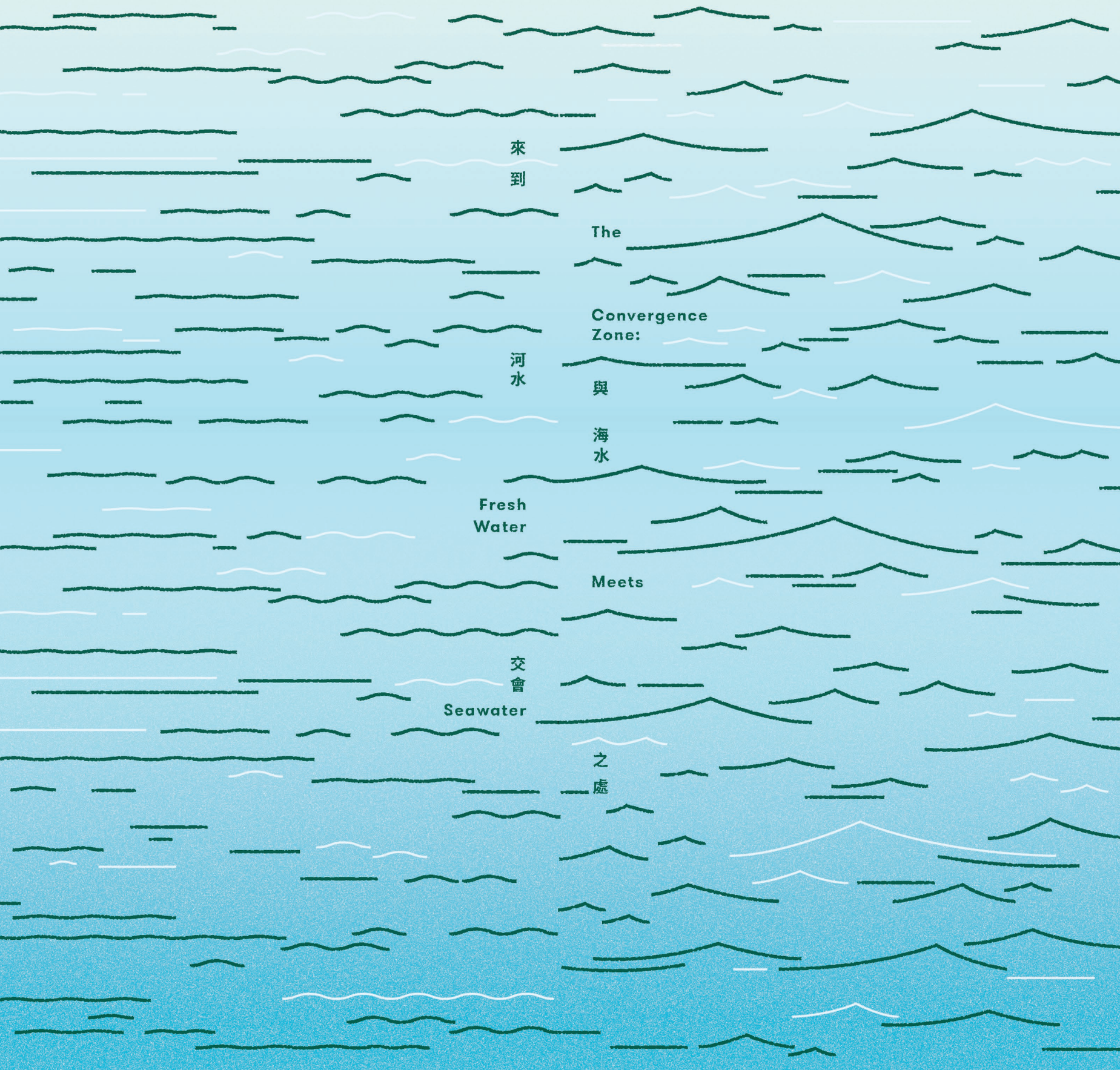
為確保河道暢通，減低水浸風險，渠務署定期檢查河道，並在有需要時清理河底的沉積物。然而，工作人員昔日進行維修保養工作時不但容易受天氣和潮汐限制，例如只能在潮退時駕駛搬土機和卡車進入河道收集淤泥，過程中亦面對一定的安全風險。有見及此，渠務署引進了多位靈活高效又可遙控的新幫手代替人手，其中一位就是清淤機械人「智水清」。牠的身形輕巧，最適合在像翠屏河近敬業街的浮島位置這種空間狹窄的地方工作——因為浮島與河底的距離只有約1米。只需要把「智水清」放入浮島下方，工作人員便可在地面遙距操控，在不用截流的情況下清淤。「智水清」利用閉路電視及聲納系統來鎖定淤泥位置，並用車頭的金屬螺旋滾輪將淤泥打碎，然後將淤泥經喉管泵到地面臨時脫水缸，最後將已充分脫水的淤泥運離作進一步處理。「智水清」不受潮汐和天氣影響，可隨時代替工作人員進入河道清理淤泥，因此我們不僅能靈活地安排清淤工作以提高工作效率，而且能大大減低工作人員所面對的安全風險。

Engineered Wetland: Creating Urban Oasis with River Water

Wetlands are like magical stages where water meets land. They come in many forms: mirror-like fish ponds, freshwater marsh forests thick with reeds, mangrove forests with tangled roots, and estuaries and shallow coastal areas where tides ebb and flow. These precious natural habitats are ideal homes for countless wild animals, especially waterbirds—serving as their breeding grounds, shelters, and feeding paradises. While Hong Kong's natural wetlands are mostly found in the northwest New Territories, there's now a 200-square-metre engineered wetland constructed right in the urban area near Kwun Tong Swimming Pool at the upper reach of Tsui Ping River. This wetland's design meticulously makes use of the river water through diversion, filtration, and purification processes to mimic natural wetland ecosystems. This wetland serves as an outdoor classroom, not only showcasing the ecological value of wetlands but also reminding everyone to protect our rivers and prevent pollutants from entering stormwater collection systems.

Robotic River Cleaners: Aquabot Takes the Plunge

To keep the river clear and reduce flood risks, the Drainage Services Department regularly inspects waterways and clears sediment from the riverbeds when needed. However, maintenance work in the past was often affected by weather and tides—for example, workers could only drive excavators and trucks into the channel during low tide to collect silt, and the process involved considerable safety risks. To address this, the Department introduced several flexible, efficient, and remotely controlled helpers to replace manual work, including the desilting robots "Aquabot". Its compact design makes it perfect for working in tight spaces like the pontoon area near King Yip Street along Tsui Ping River—where there's only about 1 metre clearance between the pontoon and riverbed. Workers could simply lower "Aquabot" into the river, and then remotely control and move it to the pontoon area from ground level, clearing sediment without needing to divert the river flow. "Aquabot" uses CCTV and sonar systems to locate silt, then breaks it up with metal spiral rollers at the front, pumping the sediment through hoses to temporary dewatering tanks on the ground. The fully dewatered sediment is then transported away for further processing. Since "Aquabot" isn't affected by tides or weather, it can enter the river anytime to clear sediment, allowing the maintenance team to schedule dredging work more flexibly to improve efficiency while significantly reducing safety risks for the workers.


來到
The
Convergence Zone:
河水與海水
Fresh Water
Meets
交會
Seawater
之處

潮間帶中的智能水閘

潮間帶乃海陸交接的地帶，也就是鹹淡水交界處，潮漲時，海水悄然爬上岸邊，把陸地擁入懷中；潮退時，大地再次現身，露出水底的紋理與生命的痕跡。位於偉業街至興業街之間那段的翠屏河，正是這樣一片充滿韻律的地帶，也是整條河流最寬廣的一段。該河段至河口位置屬潮間帶，因此水位會因潮汐起伏不定，在活化工程前，當潮退及水流不足時，河床便裸露在陽光下，沉積物也容易積聚。為了令翠屏河的水流更穩定，渠務署透過活化工程在鴻圖道和興業街之間的河段設置一道2.5米高的智能水閘，它可隨潮汐漲退而升降，以調節水位，形成蓄水區，穩定翠屏河水體，減少河道乾涸機會，改善氣味問題。同時在視覺上營造瀑布效果，為河岸添上詩意。

當河道上游的水位高於預設的水位，或天文台發出惡劣天氣警告訊號時，智能水閘亦會預先降低，平臥河床，確保河道發揮最大的排洪能力。

在水中央有個浮島

而在這智能水閘的上游，一個隨水位浮動的小小浮島也悄悄登場。它會隨河水上下升降，幅度約為1米，輕輕搖曳，為市民提供一個富有動感的近水空間。這是全港首條同時安裝浮島和智能水閘的河道，為市民提供「在水中央」的體驗，感受「新角度・新河景」。

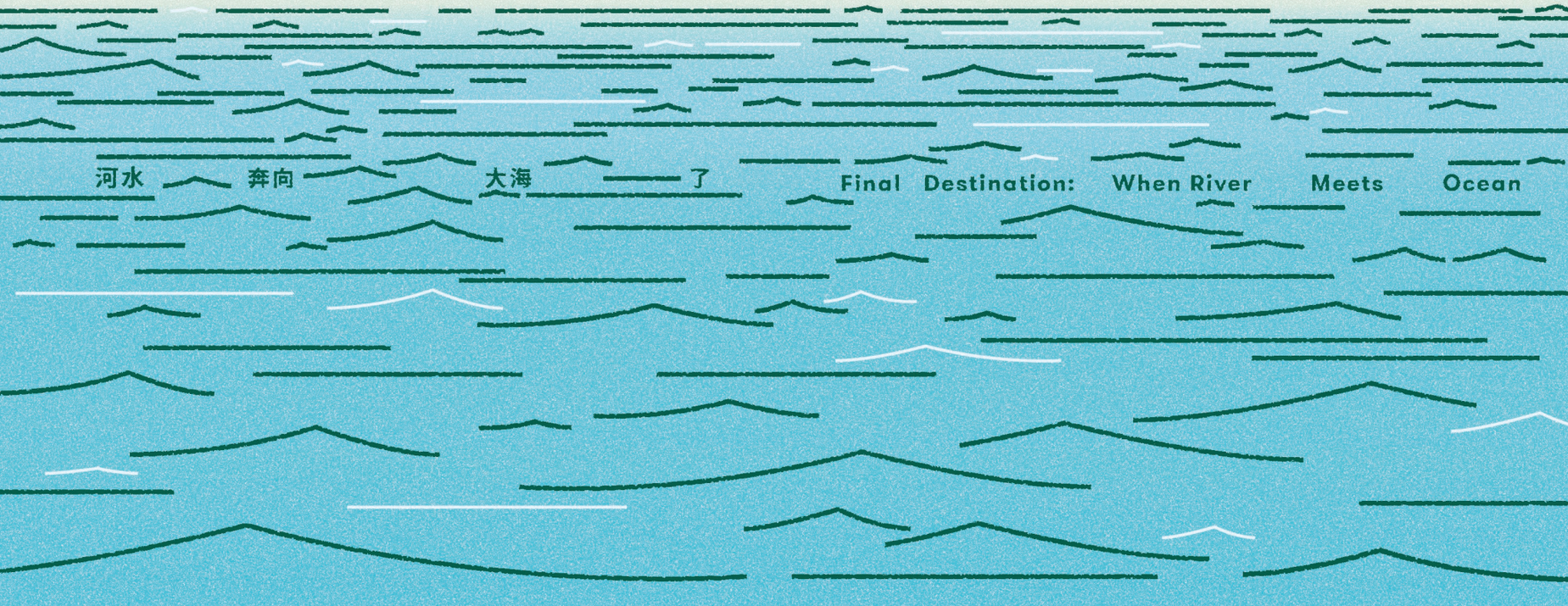
Smart Water Gate in the Intertidal Zone

The intertidal zone is where the ocean meets the land — the area where freshwater and seawater interact with each other. When the tide rises, seawater quietly creeps up the shore, embracing the land; when it retreats, the earth emerges again, revealing the textures and traces of life on the seabed. The section of Tsui Ping River between Wai Yip Street and Hing Yip Street is exactly this kind of rhythmic zone, and it's also the widest stretch of the entire river. This section all the way down to the river estuary is an intertidal zone, where water levels fluctuate with the tides. Before the project, when tides were low and the water flow was insufficient, the riverbed would be exposed to sunlight and sediment would easily accumulate. To stabilise Tsui Ping River's water flow, the Drainage Services Department installed a 2.5-metre-high smart water gate at the river section between Hung To Road and Hing Yip Street. This water gate rises and falls in sync with the tides to regulate water levels, creating a water storage area that stabilises the river's water body, reduces the chance of the river drying up, and relieves odour issues. It also creates a cascading waterfall effect that enhances the riverbank's visual appeal.

When upstream water levels exceed preset levels, or when the Hong Kong Observatory issues severe weather warning signals, the smart water gate automatically lowers to lie-flat position on the riverbed, releasing the full flood-carrying capacity of the river.

Floating Experience: Hong Kong's First River Pontoon

Upstream from the smart water gate, a small pontoon that floats with the water level quietly makes its debut. It rises and falls with the river water within a range of about 1 metre, gently swaying to provide citizens with a dynamic water-friendly space. This is Hong Kong's first river to feature both a pontoon and smart water gate, providing visitors with a unique experience of being surrounded by water and an entirely new way to see the river.


河水 奔向 大海 了
Final Destination: When River Meets Ocean

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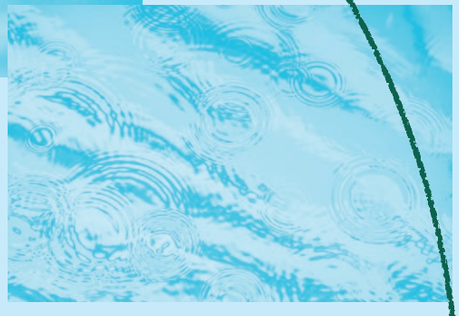
02

03



水滴最終又返回天上，展開下一段旅程

在翠屏河活化工程背後，藏著一場精彩的科技旅程——人工智能系統助工程人員未雨綢繆、迅速應對突發情況；清淤機械人在河底默默暢通河道；還有多項措施，通通以「安全」為第一原則，在氣候變化的挑戰下，成為城市應對極端天氣的重要盟友。

水漲，水退，水終會再次回到天空，循環不息。而追蹤這些流水動向的系統，也一刻不停地運作——就像一位永遠在線的觀察者，日以繼夜默默守護這條河和社區。當你下次沿著翠屏河悠閒散步時，也許看不見「小渦旋」或eRAIN正在努力分析，但不妨留意那幾個安靜佇立的水文站、靈活升降的智能水閘，甚至那片模擬天然生態的人工濕地——那是科技與環境的對話，既默默守護著河流，也令我們的社區變得更宜居。

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Full Circle: From Sea to Sky, the Cycle Begins Anew

Behind the Revitalization of Tsui Ping River lies a fascinating technological journey—AI systems help engineers prepare for the unexpected and respond swiftly to emergencies; desilting robots quietly clear sediment from the riverbed; and numerous other measures all follow “safety first” principles, serving as vital tools for a city combating extreme weather challenges caused by the climate change.

Water rises and falls, eventually returning to the sky in an endless cycle. The systems tracking these water movements operate continuously—like a perpetually present observer, silently protecting this river and the community day and night. When you take your next leisurely stroll along Tsui Ping River, you might not see SWIRLS or eRAIN working hard on their analyses. Instead, take a moment to notice those gauging stations. Look for the smart water gate that rises and falls with flexibility, or even that engineered wetland mimicking natural ecosystems—these represent a dialogue between technology and environment, silently protecting our river while making our community more liveable.

翠屏河速寫

Tsui Ping River Snapshot

翠屏河的迷思：
為何河水不是清澈見底的？

Why Isn't the Water Crystal Clear?
Understanding Tsui Ping River's True Nature

有市民關心，為何翠屏河在活化後，河水仍未如想像般清澈見底？事實上，翠屏河是一條真正運作中的城市河道，肩負實際的排洪功能。每逢下雨，大量雨水會夾帶泥沙、枯葉及其他自然或人為雜質流入河中，形成懸浮物和沉積物，這些都是河流生態的一部分。與經濾水處理的人工景觀河不同，翠屏河保留其天然水體特性，因此水色會隨天氣和水流狀況而變化，並不會時時保持清澈。

正因如此，它更值得我們珍惜——翠屏河是一條有生命的城市水道，反映自然真貌。唯有理解並尊重它的本質，我們才能共同守護這片珍貴的城市河流。為了實現這個願景，渠務署過去數年已陸續推行多項具體措施，為的就是希望大家珍惜翠屏河這條大家共同擁有的社區資產。

Some people wonder why Tsui Ping River water isn't perfectly clear despite the revitalization efforts. The answer is simple: this is a working urban river with real flood management responsibilities. Every rainfall brings mud, fallen leaves, and various natural and human debris into the water, creating the suspended particles and sediments that are normal parts of any river ecosystem. Unlike artificial landscape waterways with filtration systems, Tsui Ping River maintains its natural characteristics—meaning water colour changes with weather and flow conditions rather than staying constantly clear.

This is precisely what makes it special. Tsui Ping River is a living urban waterway that reflects nature's authentic character. Only by understanding and respecting this reality can we work together to protect this precious community resource. Over the past few years, the Department has rolled out a number of measures to achieve this goal, hoping everyone will treasure Tsui Ping River as our shared community asset.

[1] 旱季截流器
Dry Weather Flow Interceptors Keep Pollutants Out

為減少污染物經雨水渠流入河道，渠務署在翠屏河的集水區內共設置了五個旱季截流器，分別位於瑞和街、敬業街、偉發道、觀塘道以及成業街。這些截流器根據旱季期間受污染雨水渠的預計流量而設計，能有效攔截並分流含污染物的旱流至污水系統處理，以減少污染物進入河道的機會。

然而，翠屏河的集水區面積達520公頃，範圍廣闊，水質容易受到人為因素影響。要守護這條城市水道，仍有賴市民與政府共同努力，攜手減少污染，營造更宜居的社區環境。渠務署亦會持續監察水質狀況，並按需要作出適當跟進。

To reduce pollutants entering the river through stormwater drains, the Drainage Services Department has installed five dry weather flow interceptors throughout the Tsui Ping River catchment area which are situated on Shui Wo Street, King Yip Street, Wai Fat Road, Kwun Tong Road and Shing Yip Street. These systems are designed with a capacity based on the expected flow rates in the contaminated stormwater drains during dry seasons, effectively capturing and redirecting the polluted runoff to sewage treatment facilities rather than allowing it to reach the river.

However, the Tsui Ping River catchment spans across 520 hectares—a massive area where water quality remains vulnerable to human activities. Protecting this urban waterway requires the continued collaboration between public members and the government, working together to reduce pollution and build a more sustainable community. The Department will continue monitoring the river water quality and respond promptly as needed.

[2] 跨部門合作尋找污染源
Inter-Department Collaboration Tracks Down Pollution

渠務署的翠屏河團隊一直積極與其他政府部門合作，持續追查和尋找河流的污染源頭，並進行堵截工作。過去，團隊發現上游集水區有多宗污水渠錯駁個案，並已作出修正及跟進。有關部門亦已展開新一輪調查，以進一步改善翠屏河的水質。這些跨部門合作和持續監察，確保污染源能及早被發現和處理，為市民提供更潔淨的河畔環境。

The Tsui Ping River project team worked closely with other government departments to continuously investigate and eliminate the potential pollution sources. Their past efforts helped discover numerous cases of expedient connection of sewage pipes to the stormwater systems in the upstream catchment area which had been resolved and addressed. Relevant authorities have also commenced another round of comprehensive investigation to further improve the water quality of Tsui Ping River. This collaborative approach and ongoing monitoring ensured that any potential pollution sources are identified and addressed quickly, creating a cleaner riverside environment for everyone.

[3] 定時清淤及檢查水質
Regular Maintenance Keeps Things Running Smoothly

渠務署已定期為翠屏河檢查、清淤及抽驗水質，以確保河道排洪功能正常運作及水質穩定。一般而言，清淤工作會安排於旱季期間進行；而水質監測方面，渠務署定期為翠屏河抽驗水辦，檢測包括五天生化需氧量、氨氮、懸浮固體及大腸桿菌等指標。這些監測有助及早發現潛在污染問題，確保河道生態及改善水質。

The Drainage Services Department has regularly carried out inspections, desilting and water quality monitoring for Tsui Ping River to ensure the normal flood-carrying function of the river and maintain the stable water quality. Desilting works were typically conducted during dry seasons. The water quality testing covered parameters including five-day biochemical oxygen demand, ammonia nitrogen, suspended solids and E. coli levels. This monitoring system helps identify any potential pollution issues early ensuring the good ecological and water quality condition of the river.

4 設智能水閘穩定水流
Smart Water Gate Maintains Year-Round Flow

為防止河床乾涸及減少異味，渠務署在翠屏河下游近鴻圖道設置了智能水閘。河道在旱季時容易出現水流減少甚至乾涸的情況，導致污染物積聚並產生異味。智能水閘能根據潮汐和天氣預報自動調節高低，在潮漲時降低水閘，讓海水流到水閘上游；潮退時水閘升起，將海水儲蓄起來，形成蓄水區，讓河道全年保持穩定水流，避免河床外露並減少異味問題。這項措施有效提升河道水質及周邊環境，讓翠屏河成為更宜人的親水空間。

To prevent the riverbed from drying out and to reduce unpleasant odour, the Drainage Services Department installed a smart water gate downstream near Hung To Road. During dry seasons, the reduced water flow can cause pollutants to accumulate and create odours. This smart water gate automatically adjusts position based on the tidal patterns and weather forecasts—lowering during high tides to allow the seawater to flow into the upstream; raising during low tides to retain the seawater received, creating a water retention area that keep the river flowing consistently throughout the year. This helps prevent the riverbed from being exposed and alleviate the odour issue, enabling Tsui Ping River to become a more pleasant waterfront destination.

5 人工濕地是生態教室
Engineered Wetland Doubles as a Living Classroom

活化翠屏河工程特別在上游近翠屏邨位置設置了人工濕地，成為市區少有的生態教育空間。人工濕猶如一個戶外教室，讓市民親身觀察濕地生態，了解濕地對維持生物多樣性的重要性。透過導賞團和教育活動，公眾可認識濕地如何成為城市生態系統的關鍵一環。值得留意的是，人工濕地的生境有其獨特性，並非所有物種都適合於此棲息，因此切勿隨意放生動物。

Under the Revitalization of Tsui Ping River project, an engineered wetland was constructed at the upstream near Tsui Ping Estate—a rare ecological education space in the urban setting. The wetland functions as an outdoor classroom where people can observe the wetland ecosystem first-hand and learn about their importance in maintaining biodiversity. Through guided tours and educational programmes, visitors can discover how wetlands could serve as vital components of urban ecosystems. It's important to note that these constructed habitats do not support all kinds of species, so please don't release animals into the wetland.

相片來源：海洋復原聯盟
Image Credit: Ocean Recovery Alliance

6 社區教育 保護河流你我有責
Community Education: River Protection is Everyone's Job

渠務署與海洋復原聯盟合作，於活化翠屏河工程期間舉辦「井柵藝術@翠屏河」活動，邀請本地藝術家和學生設計及製作瓷磚，並安裝於翠屏河附近街道的雨水渠旁，提醒市民不要亂拋垃圾，保護河道和海洋生態。活動目的是透過社區藝術提高大眾對渠道污染和保護河道的關注，並鼓勵社區參與翠屏河活化計劃。

此外，工程進行期間，渠務署亦有外展教育計劃，派員到中小學舉辦講座和工作坊，向學生介紹保護環境和珍惜水資源的重要性。

During the construction stage, the Drainage Services Department collaborated with the Ocean Recovery Alliance to launch the "Grate Art @Tsui Ping River" event. This initiative invited local artists and students to design decorative ceramic tiles for installation near stormwater drains alongside the streets surrounding the river. These artistic installations remind residents not to litter and promulgate the message of protecting both the waterways and marine ecosystems. The programme utilises community art to raise awareness about drain pollution and waterway protection while encouraging local participation in the river revitalization project.

The Drainage Services Department also conducted school outreach programmes during the construction stage. The project team conducted lectures and workshops at local primary and secondary schools, teaching students about the importance of environmental protection and water resources conservation.

7 舉辦導賞團連繫公眾
Guided Tours: Connecting People to Their River

渠務署積極推動公眾參與教育活動，定期舉辦免費的翠屏河導賞團，歡迎個人及團體報名參加。透過專業導賞，參加者可親身走訪翠屏河，了解河道活化背後的理念、生態設施及保護河流的重要訊息。這些活動旨在加強社區與河流的連繫，提升市民對保護水資源及生態環境的認識。如欲了解詳情及報名，可留意渠務署的網頁及社交媒體。

The Drainage Services Department promotes public engagement through free guided tours of Tsui Ping River, welcoming both individuals and groups to participate. Professional guides lead participants along the waterway to explain the philosophy behind the river revitalization, showcase ecological features, and share important conservation messages. These programmes strengthen the bond between the community and the river while building awareness about protecting water resources and the natural environment. Please check the Drainage Services Department's website and social media for tour details and registration information.

翠屏河不只變美了，更需要你一同守護

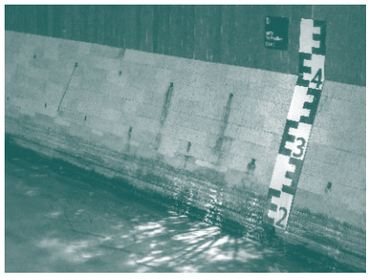
Tsui Ping River: More Beautiful Than Ever — and It Needs Your Help to Stay That Way

翠屏河的活化不僅是改善河道環境，更是實踐「地方營造」的重要一步，目標是建設一個更宜居的社區。渠務署一直積極聆聽市民的聲音，特別是觀塘社區成員的意見，與大家攜手推動河流與周邊環境的保護工作。作為一個歷史悠久的地區，觀塘長年面對渠道老化、人為污染等問題，並非一朝一夕可解決，除了市民自覺守護河道、減少污染外，渠務署亦持續推行多項措施，默默改善水質與環境，務求讓市民共享一條清澈宜人的河流。這正體現了「河畔城市」的理念——透過活化設計，拉近人與水的距離，提升整體生活質素。

The Revitalization of Tsui Ping River goes beyond simply improving the waterway—it's a crucial step in implementing the concept of "place making" that aims to create a more liveable neighbourhood. The Drainage Services Department actively listens to the public members, especially those in the Kwun Tong community, working together to protect both the river and its surrounding environment. As a historical district, Kwun Tong has long faced aging drainage systems and human-related pollution—challenges that can't be solved overnight. While residents play their part by protecting the waterway and reducing pollution, the Department continues implementing various measures behind the scenes to improve the water quality and the environment, ensuring everyone can enjoy a clean and welcoming river. This embodies the "Rivers in the City" vision—using thoughtful design to bring people closer to water and enhance the quality of life.

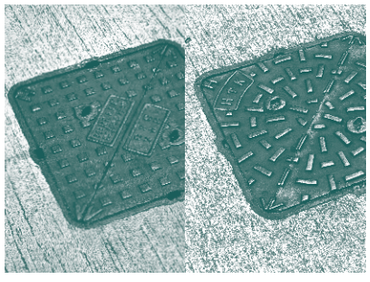
渠務小知識
Drainage Facts

①



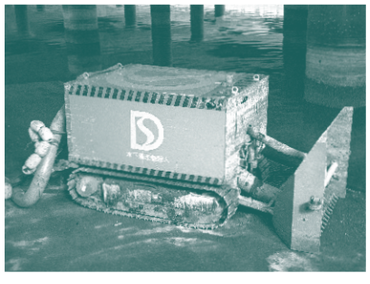
水尺
Water Level Staff Gauges

②



污水沙井、雨水沙井
Sewer Manholes, Stormwater Manholes

③



清淤機械人: 深水清
Desilting Robot: Clearwater Bot

③

清淤機械人: 創先河
Desilting Robot: Innobros

④

截流: 雨水排放隧道
Interception: Drainage Tunnel

④

蓄洪: 跑馬地地下蓄洪池
Flood Storage: Happy Valley Underground Stormwater Storage Tank

④

疏浚: 翠屏河
Drainage Improvement: Tsui Ping River

⑤

應對天文潮、風暴潮及極端天氣的準備工作
Preparatory Work for Coping with Astronomical Tide, Storm Surge, and Extreme Weather

①

水尺

渠務署利用水尺(一種外形似長尺的量度裝置)標示香港河流及水道的水位。水尺與其他技術一同使用，協助收集實時降雨、潮汐和水位數據，以助部門有效管理排水系統，從而預防水浸。翠屏河上、中、下游均設有水尺。

Water Level Staff Gauges

A staff gauge is a ruler-like measuring device used by the Drainage Services Department to indicate water levels in Hong Kong's rivers and channels. Along with other technologies, these gauges help collect real-time data on rainfall, tide levels, and water levels, assisting the Department in managing drainage and preventing flooding. There are staff gauges installed at the upper, middle and lower reaches of Tsui Ping River.

②

渠蓋

常見的渠蓋花紋主要分兩種：小正方形格子為污水沙井；圓圈放射式花紋的則是雨水沙井。因此，坊間也有「圓清方濁」這個簡單易明的說法，方便維修人員識別。

Manhole Covers

Two types of manhole cover patterns are commonly found in the drainage system of Hong Kong. The small squares indicate sewer manholes while the round pattern indicates stormwater manholes, i.e. "Round for Stormwater, Square for Sewer." This design allows easy identification by the maintenance team.

③

清淤機械人

除了用於翠屏河的智水清，渠務署亦運用多款遙控清淤機械人，這些機械人可按不同環境挑選，用於狹小空間，在減少工人工作風險的同時亦能提升效率。例如透過閉路電視及聲納裝置尋找及吸走淤泥的深水清，以及配備前置式鏟斗，能輕鬆鏟起淤泥及雜物的創先河等。

Desilting Robots

Similar to the "Aquabot" adopted at Tsui Ping River, the Drainage Services Department uses various remote-controlled robots for desilting. These robots are selected based on the specific environment and can work in narrow or confined spaces, reducing the risk to maintenance workers while improving efficiency. Examples include the Clearwater Bot, which uses CCTV and sonar to locate silt and remove it like a vacuum, and the Innobros, which uses a front-end shovel to clear away both silt and other debris.

④

防洪三招

為有效減低暴雨引致的水浸風險，渠務署因應香港不同地勢，採納「防洪三招」的策略：截流、蓄洪及疏浚。

截流:
在上游截取雨水並直接排出大海或河溪，有效減輕下游地區的水浸風險。

蓄洪:
暴雨期間，將市區部分雨水暫存於蓄洪池，以紓緩排水系統的壓力。

疏浚:
透過拉直、擴闊、挖深河道，以及擴建或建造新的地下排水渠，提升整體排水能力。

Three-pronged Flood Prevention Strategy

To effectively reduce the risk of flooding from heavy rain, the Drainage Services Department employs a "Three-pronged Flood Prevention Strategy": stormwater interception, flood storage, and drainage improvement.

Interception:
Upstream stormwater is diverted and discharged directly into the sea or rivers, which helps prevent flooding in downstream areas.

Flood Storage:
Temporary storage tanks hold some stormwater during heavy rain, relieving pressure on the drainage system.

Drainage Improvement:
River channels are straightened, widened, and deepened, and new underground drains are built to improve overall drainage capacity.

⑤

天文潮、風暴潮及極端天氣

天文潮、風暴潮及極端天氣都會影響海平面，但成因各異。天文潮是因應太陽和月球的引力而引致可預測的海平面升降。風暴潮則指由熱帶氣旋的低氣壓和強風所引致，在天文潮之上不正常的海平面上升。極端天氣則指一些偏離常態甚至破紀錄的惡劣天氣事件，如特大暴雨或超強颱風，當其與高潮位或風暴潮結合時，會構成嚴重水浸風險。

Astronomical Tide, Storm Surge, and Extreme Weather

Astronomical tide, storm surge, and extreme weather are all factors that influence sea levels, but in different ways. An astronomical tide is the predictable rise and fall of the sea caused by the gravitational pull of the Sun and Moon. A storm surge is an abnormal rise in sea level above the astronomical tide, caused by the low atmospheric pressure and strong winds of a storm. Extreme weather refers to adverse weather events that deviate from the norm or are even record-breaking, like Exceptionally Severe Rainstorm or Super Typhoon, which can cause significant flooding risks when combined with high tides or storm surges.

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