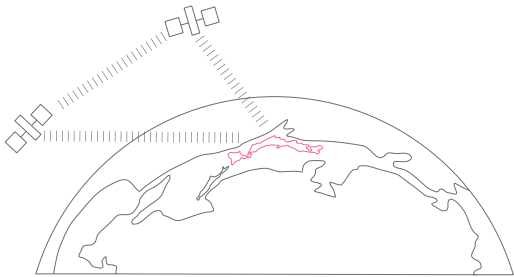


BUDGETARY CONSTRAINTS

IN A TIME OF INSULAR INTERESTS AND CLIMATIC CHANGE, THE RIVER HAS BECOME EVER MORE PRIVATIZED AND VOLATILE. THE NEED FOR A REAWAKENING GOES BEYOND SUSTAINABLE UTILIZATION. IT CALLS FOR A RENEWED COMMUNAL INVESTMENT IN THE INTELLECTUAL AND INFRASTRUCTURAL POSSIBILITIES OF WHAT WATER REPRESENTS, SOMETHING WHICH BEYOND ALL DIVISIVENESS REMAINS NECESSARILY SHARED AMONGST HUMANITY. BUDGETARY CONSTRAINTS IS A PROPOSAL FOR RE-CENTERING THE RIVER AS A HUB OF GATHERING CURIOSITIES--A PLATFORM OF TECHNOLOGICAL ADVANCEMENT AND EXPERIMENTATION IN DEMOCRATIC TRANSPARENCY. EACH RIVER STATION SERVES AS BOTH A PRAGMATIC COMPONENT OF THE REGION’S ENVIRONMENTAL MONITORING SYSTEM AND A PUBLIC, INTERACTIVE INDICATOR FOCUSED ON THE STATE OF THE RIVER. A HYBRID NEURAL NETWORK DRAWING UPON PUBLICLY AVAILABLE DATA WILL ALLOW FOR CONTINUED REFINEMENT OF MACHINE LEARNING APPLICATIONS FOR HYDROLOGY--A GROWING BUT UNDERDEVELOPED FIELD OF RESEARCH--AND AN INTERACTIVE DISPLAY POSING DROUGHT, FLOOD, AND OTHER CONDITIONS FOR THE PARTICIPATORY CONSIDERATION OF A RELIANT POPULATION.



WATER MANAGERS

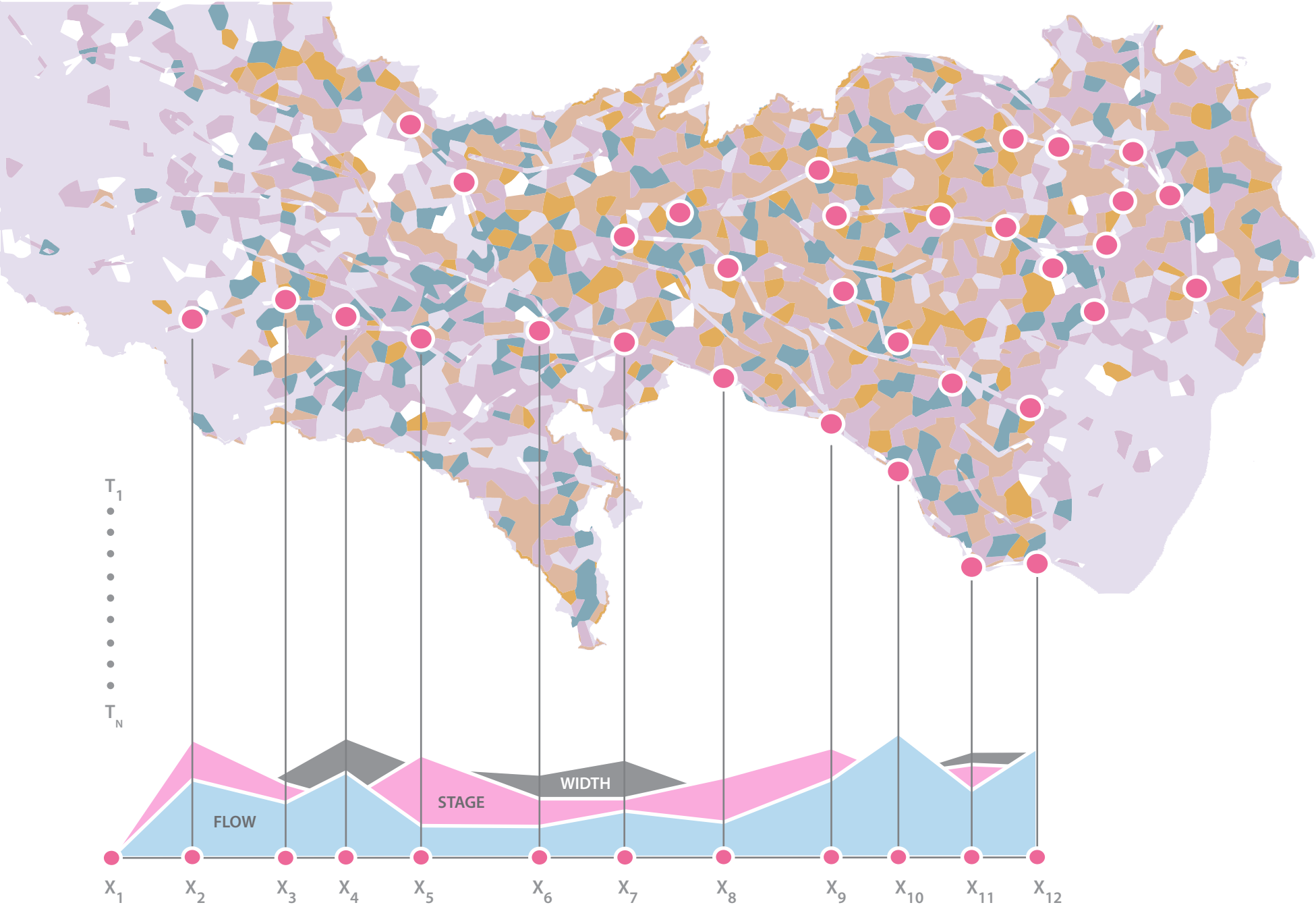


REMOTE SENSING



HACKATHONS

LAND USE

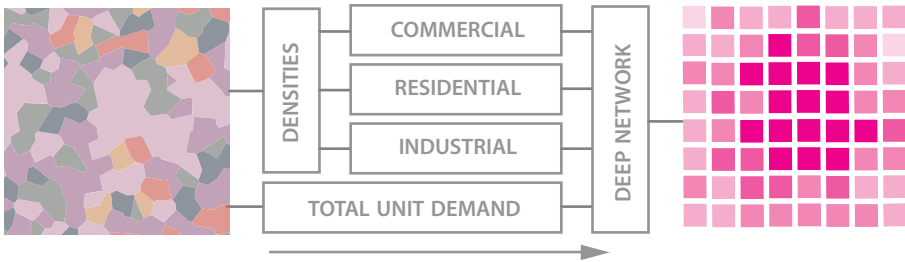


I. [INPUT SOURCING]

EMERGENT TECHNOLOGIES TO PREDICT FLOOD AND DROUGHTS CAN UTILIZE DEMOCRATIZING DATA. HACKATHONS, DRAWING UPON GLOBAL REMOTE SENSING DATASETS AND DIALOGUES WITH LOCAL WATER MANAGERS, CAN LEVERAGE THE EXPERTISE OF YOUNG MACHING LEARNING TALENT TO DRIVE OPTIMAL ARRANGEMENTS FOR NETWORK CONSTRUCTION.

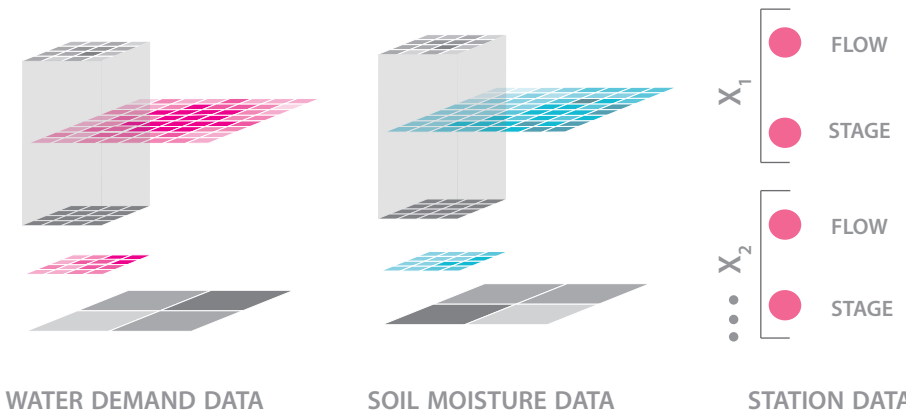
II. [DATA PREPARATION]

THE THEORIZED NETWORK RELIES ON TIME-DEPENDENT SPATIAL VARIABLES. UTILIZING REGIONAL DEMAND FROM TOKYO’S EXISTING WATER SUPPLY DATA, THE MAKEUP OF KNOWN LAND USE DENSITIES CAN BE FED THROUGH A TRADITIONAL DEEP NETWORK TO EXTRAPOLATE PREDICTED WATER DEMAND AT LOCALIZED GRIDS. SOIL MOISTURE IS DIRECTLY AVAILABLE FROM IMAGERY.



III. [NETWORK THEORY]

CONVOLUTIONAL NEURAL NETWORK (CNN) FILTERS WITH RESIDUAL LEARNING, AS POSED BY ZHENG, ZHEN, & QI, 2017 (DEEP-SPATIO TEMPORAL RESIDUAL NETWORKS FOR CITYWIDE CROWD FLOWS PREDICTION), ARE USED TO INFORM A “PULL” EXERTED BY SPATIAL VARIABLES ON RIVER STATION INPUTS AT TIME “T”. THIS APPROACH IS NOVEL IN THAT IT PARSES REGION-WIDE IMAGERY IN GREAT DETAIL, EFFICIENTLY AND WITHOUT SUBSAMPLING. IT ALSO ALLOWS FOR ACCESSIBLE IMAGERY INPUTS AVAILABLE TO LOCAL STUDENTS OR RESEARCHERS FOR EXPERIMENTATION.



BUDGETARY CONSTRAINTS

IV. [NETWORK STRUCTURE]

INPUTS FOR EACH CNN PATHWAY ARE GROUPED INTO SETS BY THREE DIFFERENT TIME INTERVALS--DAYS, WEEKS, AND MONTHS--TO IDENTIFY PATTERNS. OUTPUTS ARE FUSED WITH A DEEP NETWORK BUILT FROM STATION READINGS. THE TRAINED NETWORK IS CONTINUALLY REFINED AND USED TO PREDICT AND BROADCAST FLOW AND STAGE AT A GIVEN RIVER STATION FOR SOME CURRENT OR FUTURE TIME "T".

