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## Significance of Environmental History to the History of Technology

My research focuses on environmental problems, and the public policies and technology intended to solve them. Studying technology and environment together places technology in a broader context, much as the categories of race, class and gender do. The environment is partly a physical context – a way of grounding technology in particular places, times and societies. But environmental history also offers a way to look at the implications of technology for different groups within a community, and I think environmental history (particularly when it considers both the cultural and the political) helps explain why technology has played such an important role in public policy, and why technology is so enticing to people facing environmental problems.

Americans have relied heavily on technology to solve all manner of environmental problems. There are many reasons for this, but one of the most important is technology's ability to solve problems apparently painlessly, usually by displacing costs in time or space. Urban sewage and water systems, for example, export water shortages and pollution out of the city. The substitution of the automobile for the horse changed the nature of urban pollution, but contrary to perceptions at the time, did not eliminate it all together.

Environmental history has been attentive to the political and social dimensions of environmental change. This is unsurprising, really, because the distribution of natural resources and environmental damage are very tangible markers of influence in society. Before sewage and water treatment, cities built waterworks by taking clean water from their rural neighbors. State and federal authorities supported cities in this because they felt these waters served a greater number of people or would support more production in the city. As Joel Tarr has demonstrated, an even balder political calculation that voters would pay taxes to clean their own drinking water but not that of their downstream neighbors prompted cities to pollute rivers with sewage, even though it might have cost less to keep the rivers cleaner in the first place. The networks cities built in the process have had enormous impact on the ecosystems around cities, and on subsequent efforts to address these impacts.

But environmental history also offers insight into culture: the process by which a condition comes to be identified as an environmental problem can reveal a great deal about what people think a specific environment should be. So, nineteenth century urban sanitation was not just about public health, but also

about people's fears that immigration, poverty, and crowding threatened the very fabric of civil society. In short, many of the people who wanted sewers, waterworks and parks hoped they would restore society and keep it from changing in unwelcome and dangerous ways. In all of these each cases, communities facing sanitary problems sought technological solutions which removed the costs of urbanization from their communities.

Finally, displacing urban problems onto other communities (or other parts of the city itself) creates a host of resource conflicts. The whole question of resource distribution is one of great interest to environmental historians, and one of the areas in which environmental history has the most to offer the history of technology. In the cases of water resources mentioned above, for example, environmental history offers a way to evaluate the distribution of power in society, public priorities and how technology serves (or fails) subgroups within society. Some of the best environmental history focuses directly on the nested social and environmental consequences of urbanization, industrialization, and the technologies applied to address them. A number of recent works have also examined resistance to regulations, and technological and environmental change that restricted poorer peoples' access to subsistence resources, concentrated pollution in the poor and minority neighborhoods, or defined minority subsistence practices as environmental or public health hazards.<sup>1</sup>

As for myself, I have tended to focus on political responses to environmental problems at the nexus of politics, culture and the environment. I find myself increasingly interested in who gets to participate in defining conditions as problems and framing solutions to those problems, and in exploring how institutions limit political participation. One of the more interesting things that my research on Los Angeles suggests is that Americans are frustrated by the limitations, inefficiencies and taint of special interests in local government, but prefer local autonomy to federal intervention, even as

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<sup>1</sup> Karl Jacoby, *Crimes against Nature: Squatters, Poachers, Thieves, and the Hidden History of American Conservation*, (Berkeley: University of California Press, 2001). On the impact of environmental change on subsistence patterns for poorer Americans, see Ralph H. Lutts' "Like Manna from God: The American Chestnut Trade in Southwestern Virginia," *Environmental History* 9:3 (2004) 497-525; Matthew Morse Booker, "Oyster Growers and Oyster Pirates in San Francisco Bay," and Coll Thrush "City of the Changers," both in *Pacific Historical Review*, 75:1 (2006), 63-88; 89-117. For a summary of the race-class debate, see Jerry T. Mitchell, Deborah S. K. Thomas and Susan L. Cutter, "Dumping in Dixie Revisited: The Evolution of Environmental Injustices in South Carolina," *Social Science Quarterly* 80:2 (1999), 229-243. See also Ellen Stroud, "Troubled Waters in Ecotopia: Environmental Racism in Portland, Oregon," *Radical History Review*, 74 (1999), 65-95; and Connie Y. Chiang, "Monterey-by-the-Smell: Odors and Social Conflict on the California Coastline," *Pacific Historical Review*, 73:2 (2004), 183-214.

they embrace the inefficiencies that come with competition between political institutions as essential to American democracy.

### Oil in Los Angeles, 1890s – 1940s

Technology, engineers, and technical explanations of environmental crisis are critical parts of environmental and political debates. In Los Angeles's early twentieth century oil fields, technological innovation had a direct influence on policy questions. There, innovations in drilling technique led to a series of conflicts over where oil extraction would take place. As soon as one conflict ended, innovations in drilling technology created new drilling opportunities and yet another land use dispute. These conflicts begin with the discovery of oil in downtown Los Angeles in the 1890s. As speculators and wildcatters rushed into the city, many Angelenos feared they would overrun public parks as they had residential subdivisions and the occasional cemetery. So, in 1897, the city council responded by banning oil wells in and near Los Angeles' parks.<sup>2</sup> Next, oil drillers figured out how to drill for oil in underwater oil deposits by building piers out from the shore. Oil piers sprang up from the beaches of Santa Barbara, Ventura, Los Angeles and Orange Counties.<sup>3</sup> Noisy machinery, oil spills and the piers themselves created physical barriers for beach-goers, and forced Angelenos to decide whether the beach should be a site for recreation and respite from the urban, industrial world, or whether it was a place of resource extraction and profit. The idea of the beach played a key role in this conflict, and contributed to the relative ease with which a resolution outlawing oil piers passed in the 1920s.

The regulation of oil piers did not significantly threaten oil production in California because by the time it passed, oil companies had figured out how to steer their oil drills with some accuracy. By whipstocking (drilling horizontally as well as vertically into an oil deposit), oil companies could reach underwater oil from wells placed a little ways behind the beach. This solved the direct conflict between oil and recreation, but did not significantly reduce the industrial nature of the beach front in oil-producing sections of the city. In fact, whipstocking significantly complicated drilling and leasing rights, and reintroduced conflicts over city parks. During World War II, oil companies sought permission to erect oil wells outside Elysian Park, and whipstock into the deposits they were sure lay

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<sup>2</sup> "That Oil Ordinance," LAT 25 Jan 1897. From Proquest.

<sup>3</sup>Pier drilling, as the technique was called, was pioneered in 1898 in Summerland, California. Freudenberg, *Oil in Troubled Waters*, 17.

under the park. This reopened the question of extracting oil from public parks that the city council had thought settled in 1897.

### Air Pollution in Los Angeles, 1940s – 1950s

New technology created conflicts over oil and land resources, but a dearth of technology and scientific information could also be a problem. This was very much the case when Los Angeles first confronted smog. In the summer of 1943, a low-temperature inversion concentrated industrial fumes and automobile exhaust in downtown, creating an eye-stinging cloud that temporarily blinded drivers, inflicted headaches on munitions workers, and choked patients on the tuberculosis ward of Los Angeles General Hospital. Initially, one war plant manufacturing butadiene in downtown Los Angeles for the federal Rubber Reserve Corporation seemed to be the culprit. This initial episode convinced most Angelenos that war industries were the lone or primary cause of smog.

From the very beginning, even as the public adopted a narrow view of air pollution, elected and civic leaders throughout Los Angeles county recognized the problem as far more complicated. Within a few months of that first gas attack, Los Angeles city and county officials identified many different sources of pollution, including orchard heaters, automobiles, inefficient locomotives and tug boats, and Angelenos' practice of burning their garbage in open pit dumps and small backyard incinerators. This official view had almost no impact on public opinion.

The official position on smog came directly from reports and research sponsored by the Los Angeles Chamber of Commerce. The Chamber drafted ordinances for the Los Angeles city council and county board of supervisors, and weighed in on the potential of industrial zoning to reduce smog.<sup>4</sup> Based on the Chamber of Commerce's research, and lacking other authoritative information, city and county officials attacked air pollution comprehensively. They outlawed orchard heaters and back yard incinerators; they closed dumps. They even discussed curbs on automobile traffic during smog emergencies. The county Air Pollution Control District, in charge of smog controls after 1945, did not ignore industry, but rather worked closely with the Chamber of Commerce to institute more-or-less voluntary curbs on industrial pollution. County

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<sup>4</sup> LAACC Minutes, 14 September 1944, 3-4; LAACC Minutes, 18 November 1948, 2; LAACC Minutes, 6 Jan 1949 to 29 Dec 1949, 6; LAACC Minutes, 29 Oct 1953, 7-8; Morris Pendleton speech before Los Angeles Area Chamber of Commerce Board of Directors, LAACC Minutes, 19 October 1944; "'Smog' Blankets City Again" *Los Angeles Times*, 26 October 1944.

personnel tested industrial pollution technologies, and worked closely with manufacturers to find the best emissions controls for their plants.

The Chamber of Commerce was unusually aggressive in the fight against smog, partly because business owners suffered from smog like everyone else, and partly because the Chamber feared that the continuing crisis would either turn the public against industry or inspire voters to demand much more stringent regulation. So the Chamber of Commerce pressured its members to reduce pollution and to comply with air pollution regulations.<sup>5</sup> From a technical standpoint, Los Angeles' did better than many cities in similar situations, in part because the Chamber of Commerce did push its members to reduce pollution. Elsewhere, similar business and manufacturing organizations were much more obstructionist.

Cooperation between the Air Pollution Control Board, industry and the Chamber of Commerce did not reassure the public. Even though the combined efforts of the county and the chamber improved conditions, they did not eliminate terrible episodes every summer. Nor did their cooperation reassure critics that the county was doing all it could to eliminate smog. Public dissatisfaction centered on the fact that air pollution regulations treated industry very differently from other polluters. County officials' transparent dependence upon the Chamber of Commerce for their policies did not help either, nor did the county's continued insistence on the major role that automobiles played in smog when the person on the street was still inclined to blame industry.

Clearly, the disconnect between official and public perceptions of smog is to blame for a great deal of the conflict over air pollution policy in mid-century Los Angeles. So, air pollution is an excellent example of what happens politically and environmentally when new environmental problems emerge well ahead of the science that might explain them or the technology that might solve them. Los Angeles was not the first American or European city to experience air pollution. By the 1940s, Americans and Europeans had plenty of experience combating smoke and soot -- particulate air pollution -- from coal. A number of cities, Saint Louis among them, had cleaned their skies by substituting cleaner burning anthracite for bituminous coal to reduce sulfur and particulates.

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<sup>5</sup> Minutes of the Los Angeles Area Chamber of Commerce (LAACC) Board of Directors Minutes, 22 Sept 1944, 12, Regional History Center, University of Southern California. (Hereafter cited as LAACC Minutes); "Air Pollution Regulations" LAACC Minutes, 2 June 1955, 4-6. Among the signs of mounting public anger at industry were remarks by Pasadena city officials in 1945. See "Remarks of Mr. Robert E. Dawson, Chairman, Pasadena Board of City Directors, before Board of Supervisors, Los Angeles County and City Council of Los Angeles," November 20, 1945, Ernest East Collection, Southern California Auto Club archives.

Pittsburg, too, had tried to reduce smoke by regulating boiler operations. Los Angeles officials applied the strategies pioneered elsewhere, using a smoke-density scale to establish emissions standards, for example. But these measures had less success in Los Angeles because LA's problem was not primarily one of particulate pollution.

Los Angeles suffered when automobile exhaust baked in the California sunshine. This seemed counterintuitive to most observers; how could colorless car exhaust become that signature eye-stinging, brown haze? The photochemical reaction responsible was not proven until 1954.<sup>6</sup> In the meantime, public perceptions lagged behind public policy. This meant that officials had little hard evidence to support their claims that smog deriving increasingly from automobiles rather than industry. The newspapers and organizations most critical of official smog policy regarded the county's constant references to automobile exhaust as "hokus pokus" that enabled the county to delay effective action against polluters.<sup>7</sup> The fact that the county air pollution control district seemed perfectly content to let diesel buses replace non-polluting electric trolleys only made Angelenos more skeptical of official declarations about automobiles and smog.<sup>8</sup> Even after the Air Pollution Control Board announced the proof that automobile exhaust caused smog, six thousand Angelenos attended a mass meeting to demand a grand jury investigation of smog policy, the Highland Park Optimist Club donned gas masks for their weekly luncheon to show their "dismay over the inability of area officials to cope with smog,"<sup>9</sup> and Angelenos' discontent was covered in the national media.<sup>10</sup> Moreover, evidence that cars caused smog did not give Los Angeles officials many practical policy options. The automobile industry, not elected officials in Southern California, controlled the design and construction of cars. They dismissed Los Angeles' smog as a unique climatic event, and delayed the adoption of the catalytic converter until the 1970s.<sup>11</sup> Until then, Los Angeles

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<sup>7</sup> "Letter points delay in smog problem" *Citizen News* 21 Nov 44, Clippings files, Bowron Collection.

<sup>8</sup> Marion Shanafelt to Herbert C. Legg, 23 Oct 54, JAF c Box 25. One of the first constituent letters to mention electric transit to reduce pollution was C. Curtin Mitchell to City Council, 16 Oct 1945, City Archives, Box A-876, Communication 21228. See also the 1948 suggestion that LA build electric subways in James T. McCauslin to City Council, 3 December 1948, City Archives, Box A987, Communication 35723, and 1952 complaint from Alhambra Chamber of Commerce that APCD did not protest conversion of streetcars to buses, in Woody Wade to Board of Supervisors, 6 Oct 1952, JAF c, Box 25.

<sup>9</sup> "Smoggy Nightmare" *Time* (64)1 Nov 1954, 63-64, Clippings files, Bowron Collection.

<sup>10</sup> See "Smoggy Nightmare" *Time* (64)1 Nov 1954, 63-64; and "Blight on the Land of Sunshine" *Life* 37:18 (1 Nov 1954), 17-19, Clippings files, Bowron Collection.

<sup>11</sup> "For Immediate Release," 10 Mar 1953, Hahn Papers, box 226.

officials could cooperate with local industries and domestic sources of pollution, or they could restrict driving. This, they knew better than to attempt.

Los Angeles officials had little recourse but to regulate the easiest targets. In this way, Los Angeles smog policies were practical as well as politic. The Los Angeles Chamber of Commerce was equally pragmatic, jumping in to frame the debate before it had even begun, and taking an active role in reducing smog from industrial and commercial sources. If nothing else, Los Angeles' early struggle against air pollution reveals how control over technical knowledge (combined with a good dose of political acumen) gave the Los Angeles Chamber of Commerce disproportionate influence over public policy. The Chamber knew this, and proved all too ready to defend their role as the voice of the public in the air pollution debates when other groups demanded a seat at the policy-making table.<sup>12</sup>

Like the conflicts over oil drilling, some of the tension over smog grew out of the contrast between public perceptions of what the region should be – a land of healthy outdoor living and sunshine – and what air pollution forced Angelenos to acknowledge it had become. But this realization took place at a moment when neither existing technologies, nor some very odd proposed inventions (fans on top of streetlights or huge exhaust tunnels through the mountains to blow smog into the desert) could help smooth the way. Starting with public ideas about the environment and reactions to the industrialization of Los Angeles helps explain why Angelenos reacted as they did to the technological and political solutions that were proposed.

### Flood Control on the San Gabriel River, 1927-1948

Like air pollution control, flood control was an area of technological uncertainty, or at least technical debate, for Los Angeles. Experts disagreed over whether Los Angeles should straighten and deepen river channels, build dams high in the mountain watersheds, spread floods over gravels to percolate into the aquifer, or catch and hold flood waters behind dams on the valley floor. The availability of federal funds, popularity of each strategy amongst voters and civic leaders, and the value of property affected by floods or flood control options all colored these policy decisions. Significantly, Los Angeles dismissed the one thing that could have prevented much of the flood problem without recourse to technology when local officials ignored recommendations that they

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<sup>12</sup> Arnold O. Beckman to Board of Supervisors, 17 Jan 1955, in Los Angeles Area Chamber of Commerce (LAACC) Board of Directors Minutes, 20 Jan 1955, Regional History Center, University of Southern California, Los Angeles.

use Los Angeles' well-evolved zoning regulations to keep Angelenos out of harm's way, or to reduce the amount that urbanization increased runoff, because these regulations would dampen the region's growth.<sup>13</sup>

Although there was real disagreement over flood control designs, the discussion of the technical merits of various approaches barely masked its political heart. In the case of the San Gabriel River, elected officials and technical experts not only had to choose a plan that would work, they had to decide who would have to give up property, community and homes to protect everyone else. The biggest debate over San Gabriel River flood control arose when the Army Corps of Engineers proposed a flood control basin at the Whittier Narrows to protect medium-sized agriculture and large-scale industry on the lower sections of the river by displacing more modest residential and agricultural landowners above the narrows. The Army Corps calculated that the dam would cost less, provide better protection, displace fewer people, and condemn less expensive lands than channel improvements downstream. This seems like a pretty obvious choice from the political, economic and technical standpoints. But the way the Army Corps managed public debate over Whittier Narrows Dam suggests that there is more to it than utilitarian calculus or cost-benefit ratios.

First, some background. Whittier Narrows Dam is one of five major flood retention dams built in Los Angeles county in the 1940s and 1950s.<sup>14</sup> It sits astride the San Gabriel River and Rio Hondo in eastern Los Angeles county, about a third of the way from the mountains to the sea, where it collects and holds flood waters from the mountains and San Gabriel Valley to keep them from overflowing the river channels that wind through the densely urban lower sections of the river. By 1939, the Army Corps of Engineers as well as Los Angeles County flood control personnel argued that, although they could build river channels to carry all the runoff, it would be far cheaper to condemn inexpensive land in places like Whittier Narrows to "temporarily store and control the floods from the mountains" than it would be to build those superchannels.<sup>15</sup>

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<sup>14</sup> Hansen Dam (Big and Little Tujunga Wash\*\*), Devils Gate (Arroyo Seco), and Santa Fe (San Gabriel River) dams all sit just at the base of the mountains; Sepulveda (Los Angeles River) and Whittier Narrows dams (San Gabriel River and Rio Hondo) are both five or six miles further down stream.

<sup>15</sup> U. S. Engineer, "Flood Control in the Los Angeles District" (Army Corps, 1939), 3-4, Los Angeles District, Army Corps of Engineers archive.

The City of Long Beach first proposed a dam at Whittier Narrows in the 1920s to control floods and provide their city with its own water supply.<sup>16</sup> By 1930, the Los Angeles County Flood Control District had added Whittier Narrows dam to its comprehensive flood control plans.<sup>17</sup> Nothing came of these plans for nearly a decade, though, because the District was preoccupied with other projects, voters rejected construction bonds,<sup>18</sup> and the county's applications for New Deal funds for flood control failed.<sup>19</sup>

After the Flood Control Act of 1936, which placed the Army Corps of Engineers in charge of flood control nationwide, Los Angeles turned over its flood control construction to the federal government.<sup>20</sup> This decision was largely a financial one, but because the Army Corps used Los Angeles County's comprehensive plan as the basis of its flood control proposals, it did not eliminate local influence over flood plans.<sup>21</sup> The Army Corps embraced the Whittier Narrows project for two technical reasons: 1) it reduced overflows from the Rio Hondo into the Los Angeles River where dense development made any further river channel improvements enormously expensive even as urbanization increased runoff; and 2) it reduced the scale of channel improvements required for the lower San Gabriel River.<sup>22</sup> Moreover, on the coastal plain, Whittier Narrows Dam had a strong, well-connected constituency ready and able to help secure congressional authorization for the project. This

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<sup>16</sup> Thomas Ford Hault, "The Whittier Narrows Dam: A Study in Community Competition and Conflict," M.A. thesis, Whittier College, 1948, 12.

<sup>17</sup> "Map Visualizes How Proposed County Flood Control System Would Store Water Underground," LAT 5 Oct 1930, Proquest; Hault, 12.

<sup>18</sup> Orsi, 94-95; "Board Gets Work List," LAT 22 Sept 1934; S. M. Fisher, "Report ... on Control and Conservation of Flood, Storm or Other Waste Waters of the District," LACFCD, 27 Sept 1934, 1-3 (Los Angeles: LACFCD, 1934), WRCA. The 1934 bonds failed 350,500 to 324,500.

<sup>19</sup> "P. W. A. Aid Plea Dropped," LAT 21 Mar 1934; Winston W. Crouch, *Intergovernmental Relations: Metropolitan Los Angeles, A Study in Integration*, vol. 15 (Los Angeles: Haynes Foundation, 1953), 93.

<sup>20</sup> The Army Corps of Engineers' responsibility for flood control derives from a Supreme Court decision in the 1820s which confirmed federal authority over interstate commerce and navigation. The Flood Control Act 1936 expanded this responsibility enormously, and passed in reaction to the devastating Mississippi river flood of 1927, a spate of floods in the mid-1930s, and the Depression. See Orsi, 107-8; and Bigger, 14-18, 26-31.

<sup>21</sup> James G. Jobes, "The United States Engineer Department -- Its Organization and Work in Southern California," Annual Address before the City and County Engineers Association of Los Angeles, (1936?), 13-14, ACE.

<sup>22</sup> Edwin Kelton to Office of Division Engineer, South Pacific Division, San Francisco, California, "Subject: Protest against Construction of Whittier Narrows Reservoir by Citizen's Flood Control Committee of El Monte," 7 March 1940, 6, Box 680, folder LA 821.2 WND 1938-41, ACE NARA.

is important because Congress required the Army Corps to show local support before authorizing projects.

A vocal opposition arose as soon as the Army Corps announced its plans for Whittier Narrows Dam. School districts and residents within the proposed flood control basin, and chambers of commerce and city officials from nearby city of El Monte protested that the dam would ruin them. Eventually organized itself as the El Monte Citizens Flood Control Committee and the Anti-Whittier Narrows Dam Association, they sent representatives to lobby Congress, organized petition drives and wrote letters to everyone from the county supervisors to Bess Truman. They raised questions of equity and painted themselves as victims of greedy but unnamed "big private interests." They also hired engineers who had worked for the Los Angeles County Flood Control District to challenge the dam on its technical merits. The opposition's engineers proposed river channel improvements on the lower fifteen miles of the river.<sup>23</sup> They also attacked the Army Corps for their "inexperience" and their "lack of knowledge concerning the functioning of reservoirs in the control of major flood discharges."<sup>24</sup> The Army Corps countered by accusing the dissident engineers of drafting alternative plans simply to get "a job defending the people who ... will be damaged by the proposed project," and by dismissing them as cranks. In correspondence with the San Francisco office, the Los Angeles District of the Army Corps noted that these three engineers had opposed nearly every Los Angeles Flood Control District plan since 1927.<sup>25</sup> The hydrologist I asked to evaluate their plan believes that it would not have worked.<sup>26</sup> However, their river channels mimicked the strategy that the Army Corps of Engineers had pursued doggedly on the Los Angeles River.

The self-interest of the opposition was explicit and obvious: the El Monte groups rejected the dam because it sacrificed their homes, businesses and customers to protect larger and wealthier interests downstream. They argued that if those downstream communities needed flood protection, they should give up their own property for flood channels rather sacrificing their upstream neighbors.<sup>27</sup> But, of course, the downstream group that supported the Army

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<sup>24</sup> "Engineers Attack County's Flood Control Plans," *Pasadena Star News*, 20 Sept 1940, folder LA 821.2 WND Inclosure vol. 1, 2 of 3, Box 681, ACE NARA.

<sup>25</sup> Edwin Kelton to Office of Division Engineer, South Pacific Division, San Francisco, California, "Subject: Protest against Construction of Whittier Narrows Reservoir by Citizen's Flood Control Committee of El Monte," 7 March 1940, 8, Box 680, folder LA 821.2 WND 1938-41, ACE NARA.

<sup>26</sup> Cite Chris \*\*

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Corps were just as self-interested: they liked the dam precisely because left their properties and communities untouched.<sup>28</sup>

Given the clear self-interests at work on both sides, it is important to note the Army Corps' reaction to both their supporters and their opponents. The Corps included government and non-government organizations in Long Beach and a group that called itself the San Gabriel Valley Protective Association in planning discussions from the beginning. The Army Corps cultivated support by convening meetings with these groups, consulting them on design questions, coordinating their political activities for the dam, and keeping them well-informed on the status of the project. In other words, the Army Corps of Engineers worked to "drum up support" for the dam. These efforts "led to a very close relationship between the District and the Long Beach Chamber of Commerce," and the San Gabriel Valley Protective Association.<sup>29</sup> In contrast, the Army Corps isolated opponents from each other, and treated their objections to the dam as individual and specific rather than as general and public. The Army Corps refused to hold public hearings or issue press releases explaining the project until 1946.<sup>30</sup> When water or utility companies, the National Audubon Society, and the California Department of Fish and Game raised objections, the Corps quietly modified the dam to keep these potentially powerful entities from joining the opposition. These practices secured for the Army Corps the support it needed for Congressional appropriations, but exacerbated the opposition's political weakness, and left groups like the Anti-Whittier Narrows Dam Association without a significant voice in local flood control planning or policy debate. The El Monte interests knew that the Army Corps had marginalized them, and this contributed to their sense of the dam as illegitimate.

The El Monte group was able to block Whittier Narrows Dam for a decade, but only because of an accident of Congressional districting. Whittier Narrows not only marked the boundary between the San Gabriel Valley and the Coastal Plain, and between opponents and supporters of the dam, but also between two

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<sup>29</sup> Hault, "Whittier Narrows Dam," 75 - 76.

<sup>30</sup> The Army Corps of Engineers did hold a more general public hearing on Los Angeles and San Gabriel River flood control in March 1936 "to ascertain the extent and character of flood-control improvement desired by local interests." This hearing "disclosed that local interests desire protection from floods in the drainage basins of Los Angeles and San Gabriel Rivers and Ballona Creek by the construction of adequate channel improvements, flood-control basins, and debris basins." See "Los Angeles and San Gabriel Rivers and their Tributaries, and Ballona Creek, Calif." Letter from the Secretary of War transmitting a letter from the chief of engineers, United States Army, dated April 11 1940 ..." US Congress, House of Representatives, 3d sess., Document 838., 11 June 1940.

congressional districts. This freed Jerry Voorhis, El Monte's representative, to block appropriations for Whittier Narrows Dam until he was defeated by Richard Nixon in 1948. But Voorhis could not force the Army Corps of Engineers to change their political strategy, and it took an order from the House Flood Control Committee before the Army Corps convened public hearings. Even then, the Corps delayed the hearings until it felt its supporters were adequately prepared.<sup>31</sup> The hearing did not alter the Army Corps' analysis of either the dam or the opposition.<sup>32</sup> Right to the end, the Corps described the Anti-Whittier Narrows Dam Association as making statements at the public hearing "for the purpose of confusing the issue." The Army Corps refused any formal reply to questions from the association out of concern that giving the association more information would feed its "tactics of confusion and delay."<sup>33</sup> In contrast, the Los Angeles District of the Army Corps regarded letters from "private individuals who have not been swayed by organization effort" as worthy of "considerable weight" even when these letters were clearly a product of Long Beach's campaign for the dam.<sup>34</sup>

Deadlock over the dam continued until Richard Nixon brokered a compromise between the El Monte opposition and the Army Corps in 1948. There was nothing terribly original in the compromise; it closely resembled suggestions Voorhis made in 1945. For our purposes, the controversy over Whittier Narrows Dam reveals several things. First of all, the status of the Army Corps as technical experts shielded them from political challenge. This is seen not only in the difficulty Voorhis and the El Monte critics had in forcing the Army Corps to reconsider their plans once they settled upon a flood control strategy, but also in the way the Army Corps' preference for Whittier Narrows Dam caused county officials to withdraw their earlier opposition to the project.<sup>35</sup> Secondly, the political story of Whittier Narrows reflects the ways that federal agencies reinforced the local distribution of political power, even as they changed local policies. Although changing political venues – such as transferring flood control policy from the county to the federal government – sometimes

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<sup>31</sup> E. H. Marks to Chief of Engineers, teletype, 16 Jun 1946 and attachments, in file L. A. 821.2 Whittier Narrows Dam 1946, vol. 2, Box 681, ACE NARA.

<sup>32</sup> E. H. Marks to Chief of Engineers, "Subject: Public Hearing on Alternative Plans and Restudy of Whittier Narrows Project," 28 Jan 1947, in file SPL 821.2 Whittier Narrows Dam 1947, Box 681, ACE NARA.

<sup>33</sup> Joseph O. Killian to Chief of Engineers, 30 January 1947, in file SPL 821.2 Whittier Narrows Dam 1947, ACE NARA.

<sup>34</sup> M. E. Salsbury to District Engineer, Los Angeles District, 9 Jan 1947, attachment to Joseph O. Killian to Chief of Engineers, 30 January 1947, in file SPL 821.2 Whittier Narrows Dam 1947, ACE NARA.

<sup>35</sup> Hault, "Whittier Narrows Dam," 18.

redistributes power, this did not happen when the Army Corps took on the San Gabriel River. Instead, the Army Corps slipped right into the power structures that it found in Los Angeles County and forestalled real debate over flood control options. Finally, the arguments made by both supporters and opponents reflect the many ways Americans felt about land and property, and how they used cultural tropes about landscape, farming and home to as the basis for their political campaigns. Supporters of the dam emphasized progress, prosperity and the value of property. Opponents reflected on community, "the sanctity of the American home," the rights of the minority, and the role of government in protecting the weak from their more prosperous neighbors, in addition to the value of their investments.<sup>36</sup> Although both groups clearly chose the arguments that they felt had the best political traction, these arguments reflected real conflicts in American society over what land is. Environmental history is particularly good at bringing these issues to the table.

#### Conclusion:

To get back to my interpretation of the central question that Bruce posed last spring: as an environmental historian, what does environmental history contribute to the history of technology (and visa versa)? Even environmental historians often treat the environment as merely background and context, and can lose sight of natural processes and, oddly, the environment itself. But context is important, and environmental history is really good at context in ways which I think are important for understanding technology as well as politics, culture, power, etc. Looking at the history of technology through the lens of environmental history has directed my attention at what technology does to the human and non-human world – in part by offering a way to evaluate, for example, how public works infrastructure constrains public decisions, where technology and environmental consequences go, and whether public works *work*. To probe even deeper, public discussions about the environment, and proposals to use technology to fix the environment, reveal something about how individuals and communities view their environment: what do they see as a problem, and what are they willing to do to fix problems? Technology and

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<sup>36</sup> Lois C. Hault to *El Monte Herald*, letter to the editor, 15 December 1946, in file L. A. 821.2 Whittier Narrows Dam 1946, vol. 1, Box 680, ACE NARA. See also Thomas F. Hault to R. C. Hunter, 15 Dec 1946, also in file L. A. 821.2 Whittier Narrows Dam 1946, vol. 1, Box 680, ACE NARA. On the connection between the dam and "big interests," see Herman L. Perry to Richard M. Nixon, 17 Jan 1948, PE 351, Jun - Mar 1948, Nixon Library. See also Herman L. Perry to R M Nixon, 18 Nov 1947, PE 330, Oct - Dec 1947, Nixon Library.

science also change public perceptions of the environment, transforming mere nuisances to outright crises, as when miasmatic theories of disease combined with social transformation and cast iron pipes to turn urban filth into a crisis, and when the microscope replaced miasmatic and contagionist theories of disease with the germ theory which, in turn, removed some of the sense of crisis surrounding urban filth. Ultimately, I have spent my time playing with the ways political debates over technology reflected ideas about the urban environment, and the ways technological expertise contributed to political processes. This has not made technology at all the center of my work, but this approach has highlighted for me the complex relationships between technology, technical experts, the community, culture, policy-makers and the natural world.